REPORT

OF THE

UNITED STATES COMMISSIONER OF FISH AND FISHERIES

FOR THE

FISCAL YEAR ENDING JUNE 30, 1900.

I have the honor to submit a report covering the work of the United States Commission of Fish and Fisheries for the year ending June 30, 1900, together with the reports of its different divisions. This, with the papers published in the Bulletins of the Commission and as appendices to this report, describes in full its operations for the fiscal year.

PROPAGATION OF FOOD-FISHES.

The fish-cultural work has been very satisfactory as compared with previous records, notwithstanding the results in some directions have not been as good as usual. The total number of fish distributed was 1,164,336,754, an increase (which consisted principally of shad, cod, flat-fish, white-fish, and lake trout) of about 100,000,000 over the last fiscal year.

At the stations on the Pacific coast, for reasons beyond the control of the Commission, the collections of quinnat-salmon eggs were not as large as in the past few years, and there was consequently a considerable falling off in the output of this species. The excessive drought prevailing in California during the summer of 1899 caused such low water in Battle Creek and in the McCloud River that but few salmon ascended these streams as far as the hatcheries, the larger number depositing their eggs on spawning-grounds below. At Battle Creek, where previous collections of eggs have been almost phenomenal, only 1,600,000 were taken this year. On the McCloud eggs are taken during both the summer and fall runs of fish, and this year from the first run only 6,228,260 were collected, and from the fall run 186,800, making in all 6,414,060, against over 16,000,000 the year before. The eggs taken at the California hatcheries were all hatched in that State, and the fry were liberated in the Sacramento River and its tributaries and in the Eel River.

The results at the stations operated on the Columbia River were better, although the run of salmon was poor; the number of eggs permitted the liberation of 11,000,000 fry in the Columbia and its tributaries.

On the Rogue River the Commission operated a hatchery constructed by Mr. R. D. Hume and collected over 4,000,000 quinnat-salmon eggs, 1,800,000 of which were transferred to Mr. Hume's hatchery at Wedderburn, Oreg., where they were hatched. The fry were there kept in ponds and troughs until they had reached a length of 3 to 5 inches, and were fed during this time on canned salmon prepared from the scraps and waste portions of the fish. The success with this material was so encouraging that, so far as practicable, an attempt will be made to rear all salmon fry to the yearling stage before liberating them. Heretofore the question of a suitable food, which is not too expensive, has been one of the most important factors for consideration in rearing large numbers of fish at stations remote from railroad facilities, and the use of the canned salmon referred to will materially simplify the problem.

Steelhead-trout eggs were collected on Crystal Creek, a tributary of the Rogue River, as the number taken the previous year on the Willamette River did not warrant a continuation of the work at that point. The eggs were all sent to eastern stations to be hatched, in order to maintain the successful plants already made in the Great Lakes and elsewhere. The steelhead appears to thrive in the streams of Montana, and it may be noted that over 50,000 eggs of this species were taken by the superintendent of the Bozeman station from fish liberated two years ago in Bridger Creek, in that State.

At the new station on Baker Lake, Washington, the propagation of the sockeye or blueback salmon, regarded as perhaps the most important of the salmons in the Puget Sound region, from a commercial standpoint, was begun and over 10,600,000 fry were hatched and planted in the waters of Baker Lake and Skagit River. Located as this station is, in the center of a forest reserve, and with the lake and surrounding territory set aside for fish-cultural purposes, it is believed that it will be an important factor in preserving an extensive spawning-ground of this valuable fish.

The passage by the legislature of Michigan of an act allowing the U. S. Fish Commission to catch white-fish and lake trout for fish-cultural purposes during the close season, November 1 to December 15, permitted the propagation of these species on a much larger scale than usual, and as the State failed to provide funds for carrying on its work with the commercial fishes of the Great Lakes, this Commission was enabled to lease the Michigan white-fish hatcheries at Detroit and Sault Ste. Marie.

The collection of lake-trout eggs was undertaken on the most important spawning-grounds in Lake Michigan and continued until November 10, during which time over 15,000,000 were collected, at an almost nominal expense. As only about 10 per cent were taken prior to November 1, it will be seen that this work would have been almost a failure had the old law been in force. On Lake Superior, where

operations were conducted from the Duluth station, over 12,000,000 eggs were taken. The fry hatched from these eggs were planted on the spawning-grounds of the Great Lakes.

The white-fish work was carried on in Lake Erie from the station at Put-in Bay, at Monroe Piers, Michigan, and at the three fisheries on the Detroit River, which were operated as a result of arrangements with the Michigan Fish Commission. At the latter point more than 34,000 white-fish were penned, which yielded 244,000,000 eggs; 479,000,000 eggs were taken altogether, filling all of the available hatcheries, besides permitting 10,000,000 to be sent to the New York Fish Commission and nearly 6,000,000 to that of Pennsylvania. Over 337,838,000 white-fish eggs were hatched and the fry liberated, a gain of nearly 200,000,000 over the year before. As the majority of the eggs were obtained from fish which had been impounded or penned, the excellent results of the season's work verify the prediction in the report of last year as to the advantages of this manner of insuring a supply of spawn.

The taking of spawning pike-perch in Lake Erie was seriously interfered with by the backwardness of the spring, the ice remaining in the lake till an unusually late date, so that when nets could be set and fishing begun but few fish were found on the spawning-grounds. The inference is that numbers had already spawned. The season lasted but a few days, and only 138,000,000 eggs were taken at Put-in Bay, and these were of poor quality, producing but 57,000,000 fry.

The pike-perch season was also shortened in Vermont, where, from the experience of the previous year, good results were hoped for, but freshets in the Missisquoi River prevented the fish from ascending to spawn until April 14, and eggs were only taken between the 22d and 31st. Although 115,000,000 eggs were secured at this point, the percentage hatched was not satisfactory, for a cause which is not yet determined. Steps are now being taken to prevent, if possible, similar losses in future.

At the stations in New England devoted to the propagation of marine commercial fishes very satisfactory results have been attained. Brood cod-fish were captured and held in the pools at Woods Hole for spawning purposes, and collecting stations were established at Plymouth, Mass., and Kittery Point, Me., where spawn-takers could obtain eggs from fish taken by the fishing vessels. From the 2,200 fish impounded at Woods Hole 103,440,000 eggs were secured, and from other sources 251,505,000. These were hatched at the Woods Hole and Gloucester stations and yielded 265,324,000 fry, which were liberated at suitable points along the coast. This record exceeds any previous one by over 50,000,000. The fish remaining of the brood stock at Woods Hole were numbered, tagged, and recorded before liberation, in accordance with the plan of systematic observations concerning the migration, rate of growth, etc., of the cod, which has been already described.

The efforts to increase the production of flat-fish have been continued, and in the propagation of this species better results have been attained by abandoning the method pursued in the past of artificially fertilizing the eggs. This year the brood-fish were taken to Woods Hole and allowed to spawn naturally in tanks at the station, and the percentage of fry obtained greatly exceeded former results. From 102,000,000 eggs 87,115,000 fry were hatched and planted.

The hope was expressed in a previous report that some appreciable effect had been made on the lobster fishery by the efforts which have been made to increase the supply, but the scarcity of lobsters and consequent difficulty in obtaining egg lobsters from the fishermen, notwithstanding the cordial cooperation of the State fish commissions throughout New England, has made impossible a larger output of fry. All available means were employed to obtain the egg-bearing lobsters captured by fishermen along the entire New England coast. The schooner *Grampus* and a steam smack visited the fishing centers of Maine from April to July, and agents stationed at the more important ports from New Hampshire to Connecticut were authorized to purchase egg lobsters from both fishermen and dealers.

From points north of Cape Cod less than 5,000 lobsters were secured. These produced 63,300,000 eggs, which were hatched at Gloucester and yielded 58,600,000 fry. From points south of the cape only 28,000,000 eggs were secured, from which 22,600,000 lobsters were hatched at Woods Hole.

The continued decrease of the fishery is shown by the smaller number of men now engaging in it. In 1900 only 10 men fished for lobsters from Noank, Conn., and 1 man from Block Island, while in 1899 40 men were thus employed from the former point and 15 from the latter. In Buzzards Bay and vicinity a similar decrease was noted. At New Bedford, in 1899, the Commission obtained 347 egg lobsters, while during the present season only 26 were to be had.

The propagation of shad during the season just closed was attended with very good results, some 6,000,000 more fry being hatched and planted than the year before. The new station at Edenton, N. C., was in operation for the first time, and the work in Albemarle Sound was conducted from this point. The regular stations on the Potomac and Susquehanna rivers met with good success, though the season was backward and unfavorable conditions caused the cessation of work on the Potomac by the middle of May. On the Delaware, however, the run of shad was unusually large, the fish being caught in such numbers that there was almost no sale for them. The steamer *Fish Hawk*, which was stationed on this river at Gloucester, N. J., collected over 80,000,000 eggs between April 27 and May 31. In all, 316,000,000 eggs were obtained, from which 241,056,000 fry were hatched and planted.

The constantly increasing applications for the basses and the excel-

lent results attained by the introduction of these fishes east of the Rocky Mountains have made it difficult to meet the demands made during the past few years. While the stations established for this purpose have shown fairly good results, an auxiliary collecting station recently located on the Mississippi River at Bellevue, Iowa, enabled the Commission during the past year, at comparatively small expense, to materially increase its supply of the large-mouth black bass, the crappie, and some of the other sun-fishes. In the Mississippi Valley thousands of the commoner fishes which had been left by the receding waters in the ponds and lakes which are formed by overflows, and which dry up annually, have been transferred to the main river or some of its tributaries, and thus preserved.

The stocking of suitable streams with the various species of trout has been continued, special attention being paid to the distribution of brook trout, rainbow trout, and black-spotted trout. In New England the extent of the work with landlocked salmon and trout was impaired by the severe drought which prevailed throughout that section during the fall of 1899. In Vermont and New Hampshire large numbers of fish were lost by the drying up of streams which had heretofore never been affected in this manner, and in Maine the water in many of the large lakes became so low that the trout and the landlocked salmon were not able to ascend the streams to spawn, which, of course, resulted in a material reduction of the number of eggs collected.

An investigation during the fall of 1899 shows that a large number of Atlantic salmon passed over the falls at Bangor and reached the spawning-grounds at the headwaters of the Penobscot, and from what was learned it is believed that an auxiliary station for the collection of eggs of this species on the natural spawning-grounds of this fish may be profitably established and the supply obtained to better advantage than by the methods now followed.

The propagation of the grayling at the Bozeman station has been continued, and during the spring of 1900 over 3,500,000 eggs were collected, the majority of which will be hatched at Bozeman for stocking the streams of Montana, Idaho, Oregon, and Washington, although consignments have been sent to Colorado, Minnesota, and Michigan and some of the eastern stations with a view to introducing these fish in other waters.

The following tables show the output of the various stations, the total number of fishes distributed by species, and the number of fish and eggs furnished to the States and Territories during the fiscal year ending June 30, 1900.

Fish and eggs furnished for distribution during the year ending June 30, 1900.

Source of supply.	Species.	Eggs.	Fry and fingerlings.	Adults and yearlings.
Green Lake, Me	Landlocked salmon	65,000		309,280
	Steelhead trout			3,653
	Golden trout		6,990	
	Brook trout		323,644	
	Lake trout	350,000	587,000	
Craig Brook, Me	Atlantic salmon	550,000	908,073	542,649
	Landlocked salmon	75,000	10,000	73,493
	Rainbow trout		3,000	3,000
	Brook trout		4,578	5,210
	Steelhead trout		9,000	226
	Scotch sea trout	10,000	35,000	51,647
Grand Lake Stream, Me	Landlocked salmon			111,787
Nashua, N. H	Brook trout		113,000	
	Lake trout		284,630	
St. Johnsbury, Vt	Brook trout	314,000	534,100	6,310
	Steelhead trout		20,000	2,200
	Lake trout		180,000	
	Grayling		20,000	
	Hybrid trout			1,959
	Landlocked salmon			17,280
Gloucester, Mass	Cod		138,403,000	
	Lobster		58,470,000	
Woods Hole, Mass	Cod		126,921,000	
	Flat-fish		87,115,000	
	Lobster*		18,696,000	
Cape Vincent, N. Y	Lake trout		1,875,800	
	Brook trout		280,500	
	White-fish		27,400,000	
	Pike perch		38,000,000	
Steamer Fish Hawk	Shad	15,038,000	47,875,000	
Battery Station, Md	Shad†	21,711,000	87,518,000	
Fish Lakes, Washington, D. C.	Shad			2,000,000
	Black bass, large-mouth			32,967
	Black bass, small-mouth			200
	Crappie			400
Central Station, Washington, D. C.	Shad‡		4,767,000	
	Rainbow trout		6,000	330
	Lake trout		8,368	
	Landlocked salmon		3,850	
	White-fish		256,000	
Bryan Point, Md	Shad§		55,702,000	
Wytheville, Va	Rainbow trout‖	190,000		98,039
	Brook trout			40
	Black bass			1,971
	Rock bass			4,400
Erwin, Tenn	Rainbow trout			39,620
	Brook trout			45,427
Edenton, N. C	Shad		6,590,000	
Cold Springs, Ga	Black bass			238
	Bream			1,000
Put-in Bay, Ohio	White-fish	15,832,000	109,890,000	
	Pike perch	25,000,000	27,000,000	
Northville, Mich.¶	Lake trout	3,150,000	6,535,000	88,000
	Brook trout		257,500	9,254
	Rainbow trout		3,000	385
	Loch Leven trout	20,000	8 000	
	Steelhead trout			4,500
	Grayling		56,000	
Detroit, Mich	White-fish	800,000	102,000,000	
Alpena, Mich.¶	do		36,500,000	
	Lake trout		995,000	
Sault Ste. Marie, Mich	White-fish		25,000,000	

* 3,767,000 lobster fry were also delivered by Woods Hole Station to Dr. H. C. Bumpus for scientific purposes.

† In addition to the above there were transferred to Central Station by Battery Station for hatching 8,015,000 shad eggs, and to Johns Hopkins Hospital for scientific purposes 5,000 shad eggs.

‡ In addition to the above there were liberated in Fish Lakes Station Ponds for rearing 2,849,000 shad fry; also 280,000 shad fry were furnished for experimental purposes at Central Station.

§ In addition to the above there were transferred to Central Station from Bryan Point Station for hatching 1,023,000 shad eggs.

‖ In addition to the above there were transferred to stations of the U. S. Fish Commission for hatching 240,000 rainbow-trout eggs and 500 of same to Philadelphia, Pa., for scientific purposes.

¶ In addition to the above, there were transferred to stations of the Commission 2,460,000 lake-trout eggs and 23,798,000 white fish eggs, which does not include transfers to any of the substations in the State of Michigan.

Fish and eggs furnished for distribution during the year, etc.—Continued.

Source of supply.	Species.	Eggs.	Fry and fingerlings.	Adults and yearlings.
Duluth, Minn.	Lake trout *	1,550,000	9,047,000	
	Brook trout		91,000	
	Steelhead trout		148,500	
	Grayling		34,000	
	White-fish		20,000,000	
Quincy, Ill. †	Black bass			36,248
	Warmouth bass			250
	Crappie			9,200
	Sun-fish			2,100
Manchester, Iowa ‡	Brook trout	75,000	25,000	56,350
	Rainbow trout			2,800
	Loch Leven trout			1,700
	Grayling		35,450	
	Black bass			102,660
	Rock bass			300
	Warmouth bass			1,600
	Crappie			141,384
	Bream			50,400
	Pike			5,000
	Pickerel			189
	Yellow perch			8,175
	Cat-fish			4,024
Neosho, Mo.	Rainbow trout §	65,000		57,664
	Black bass			8,610
	Rock bass			10,300
	Strawberry bass			7,797
	Crappie			320
	Quinnat salmon			1,600
San Marcos, Tex.	Black bass			110,455
	Rock bass			5,690
	Crappie			3,195
	Bream			300
Leadville, Colo. ‖	Brook trout	95,000	233,000	30,000
	Black-spotted trout	75,000		445,000
	Grayling		21,000	
Spearfish, S. Dak	Brook trout	50,000	123,000	
	Black-spotted trout			15,000
Bozeman, Mont.	Brook trout			43,500
	Black-spotted trout	10,000	120,000	277,000
	Rainbow trout			13,000
	Steelhead trout			10,000
	Grayling ¶	372,000	2,242,100	10,000
Baird, Cal.	Quinnat salmon	2,905,000	3,533,950	
Battle Creek, Cal **	do	20,000		
Clackamas, Oreg.	Quinnat salmon		4,369,422	
	Silver salmon		146,824	
	Lake trout		86,836	
	Rainbow trout		22,603	
	Steelhead trout		99,000	
	Grayling		41,668	
	White-fish		160,000	
Rogue River, Oreg. ††	Quinnat salmon		2,156,945	
	Steelhead trout	100,000		
Little White Salmon River, Wash. ‡‡	Quinnat salmon	250,000	6,626,947	
Baker Lake, Wash	Sockeye or blueback salmon		10,683,000	
	Steelhead trout		26,000	

* In addition to the above, there were transferred to the U. S. Fish Commission station at Nashua, N. H., 300,000 lake trout eggs.

† In addition to the above there were transferred to the Neosho, Mo., station 615 black bass and 725 crappie by Quincy station. There were distributed from Quincy 4,480 rock bass which were produced at Neosho, Mo.

‡ In addition to the above there were collected at Bellevue and released in the Mississippi River 15,000 carp and 20,000 buffalo-fish which would otherwise have perished. 45,750 rainbow-trout eggs were transferred to hatcheries of the U. S. Fish Commission.

§ Besides the above there were transferred to Erwin station 34,000 rainbow-trout eggs.

‖ Besides the above there were transferred from Leadville station to other stations of the Commission, for hatching, 300,000 brook-trout eggs and 100,000 black-spotted-trout eggs.

¶ In addition to the above there were transferred to stations of the U. S. Fish Commission, for hatching, 442,000 grayling eggs.

** In addition to the above there were transferred from Battle Creek to Baird station, for hatching, 1,224,300 quinnat-salmon eggs.

†† In addition to the above there were transferred to Clackamas and other stations of the U. S. Fish Commission, for hatching, 399,000 steelhead-trout eggs from Rogue River station.

‡‡ In addition to the above there were transferred to Clackamas from Little White Salmon station, for hatching, 2,436,000 eggs of the quinnat salmon.

Distribution of fish and eggs among the States and Territories.

State or Territory.	Species.	Eggs.	Fry and fingerlings.	Adult and yearlings.
Alabama	Rainbow trout			1,200
	Black bass			5,000
	Rock bass			974
	Bream			200
Arizona	Rainbow trout			2,400
	Black bass			475
	Rock bass			500
	Strawberry bass			200
Arkansas	Rainbow trout			10,350
	Black bass			1,900
	Rock bass			900
	Strawberry bass			200
California	Quinnat salmon	2,905,000	3,533,950	
	Brook trout	10,000		
Colorado	Landlocked salmon	5,000		
	Rainbow trout			8,500
	Black-spotted trout			445,000
	Brook trout		236,000	30,000
	Grayling		20,500	
	Black bass			1,040
Connecticut	Shad		6,120,000	
	Landlocked salmon			5,000
	Rainbow trout	30,000		
	Brook trout	20,000	24,985	
	Lake trout		50,000	
	Black bass			1,650
	Lobster		1,868,000	
Delaware	Shad		8,650,000	
	Rainbow trout			1,000
	Black bass			800
	Crappie			500
District of Columbia	Shad		2,095,000	2,000,000
	Landlocked salmon		3,850	
	Rainbow trout			330
Florida	Shad		2,016,000	
Georgia	Shad		2,037,000	
	Rainbow trout			3,299
	Black bass			5,883
	Crappie			100
	Bream			800
Idaho	Rainbow trout	10,000		6,000
	Black-spotted trout	10,000	100,000	15,000
	Brook trout	15,000		16,000
	Grayling			5,000
Illinois	Black bass			1,490
Indiana	Loch Leven trout		5,000	
	Brook trout		28,000	
	Pike perch		1,800,000	
	Black bass			14,273
Indian Territory	Rainbow trout			1,300
	Black bass			700
	Crappie			400
	Rock bass			300
Iowa	Loch Leven trout			1,700
	Rainbow trout			1,800
	Brook trout		25,000	37,350
	Grayling		35,450	
	Cat-fish			4,000
	Pike			5,000
	Yellow perch			8,000
	Black bass			28,740
	Crappie			122,875
	Warmouth bass			1,600
	Bream			50,000
Kansas	Rainbow trout			500
	Black bass			7,405
	Crappie			2,955
	Rock bass			1,250
Kentucky	Brook trout			1,080
	Black bass			7,850
	Crappie			3,600
	Rock bass			1,500
Louisiana	Black bass			2,650
	Strawberry bass			270
Maine	Atlantic salmon		908,073	541,858
	Landlocked salmon	30,000	10,000	450,052
	Steelhead trout		8,300	3,879
	Rainbow trout		2,800	9
	Brook trout	318,222	5,210	
	Lake trout	850,000	587,000	
	Scotch sea trout		27,000	51,647

Distribution of fish and eggs among the States and Territories—Continued.

State or Territory.	Species.	Eggs.	Fry and fingerlings.	Adult and yearlings.
Maine	Golden trout		6,000	
	Lobster		30,575,000	
Maryland	Shad	21,711,000	92,527,000	
	Rainbow trout			2,437
	Brook trout			4,758
	Black bass			1,525
	Crappie			1,800
	Cod		3,000,000	
Massachusetts	Shad		500,000	
	Landlocked salmon	30,000		9,000
	Rainbow trout	15,000		
	Brook trout	45,000	65,000	100
	Lake trout		25,000	
	Scotch sea trout	10,000	8,000	
	Hybrid trout			100
	White-fish	300,000		
	Pike perch		1,000,000	
	Black bass			2,075
	Cod		282,324,000	
	Flat-fish		87,115,000	
	Lobster		43,098,000	
Michigan	Landlocked salmon	5,000		
	Steelhead trout		15,000	4,335
	Loch Leven trout		3,000	
	Rainbow trout	25,000	2,000	384
	Brook trout		206,000	154
	Lake trout	1,850,000	10,450,000	86,650
	Grayling	200,000	56,000	
	White-fish		177,340,000	
	Pike perch	25,000,000		
	Black bass			4,045
Minnesota	Steelhead trout		118,500	
	Brook trout		59,000	14,000
	Lake trout		3,550,500	
	Grayling		24,000	
	White-fish		400,000	
	Black bass			4,000
	Crappie			375
	Rock bass			300
Mississippi	Black bass			8,746
Missouri	Quinnat salmon			1,350
	Rainbow trout			14,589
	Black bass			4,075
	Crappie			5,490
	Rock bass			700
	Strawberry bass			4,874
	Warmouth bass			250
	Sun-fish			2,100
Montana	Rainbow trout	10,000		7,000
	Black-spotted trout		20,000	165,000
	Brook trout	20,000		6,000
	Grayling		2,242,100	5,000
Nebraska	Rainbow trout			8,800
	Brook trout			4,000
	Black bass			2,300
New Hampshire	Atlantic salmon	20,000		
	Landlocked salmon	10,000		14,600
	Loch Leven trout	20,000		
	Rainbow trout	20,000		1,550
	Brook trout	20,000	50,000	
	Lake trout		284,555	
	White-fish	500,000		
	Pike perch		1,000,000	
	Black bass			490
	Lobster		1,625,000	
New Jersey	Shad	8,332,000	38,455,000	
	Rainbow trout			5,800
	Brook trout	20,000		1,000
	Black bass			10,000
New Mexico	Rainbow trout			5,100
	Brook trout	10,000		
	Black bass			200
New York	Shad		10,280,000	
	Atlantic salmon	100,000		
	Landlocked salmon	20,000		10,500
	Rainbow trout			400
	Brook trout		253,000	9,100
	Lake trout	1,800,000	1,875,800	
	White-fish	10,000,000	27,000,000	
	Pike perch		21,300,000	

Distribution of fish and eggs among the States and Territories—Continued.

State or Territory.	Species.	Eggs.	Fry and fingerlings.	Adult and yearlings.
North Carolina	Shad		6,445,000	
	Rainbow trout	10,000		17,750
	Brook trout			700
	Black bass			600
	Crappie			800
North Dakota	Brook trout		5,000	
	Cat-fish			24
	Yellow perch			170
	Pickerel			185
	Black bass			9,480
	Crappie			300
Ohio	Rainbow trout		1,000	
	Brook trout		19,500	
	White-fish		101,050,000	
	Pike perch		25,000,000	
	Black bass			4,575
	Crappie			400
	Rock bass			1,700
Oklahoma	Rainbow trout			1,450
	Black bass			1,925
	Crappie			400
	Rock bass			200
Oregon	Steelhead trout		99,000	
	Rainbow trout		22,303	
	Black-spotted trout			10,000
	Brook trout			2,000
	Grayling		41,668	
	Silver salmon		146,824	
	Quinnat salmon		6,526,367	
Pennsylvania	Shad	6,006,000	2,925,000	
	Atlantic salmon	250,000		
	Rainbow trout		6,000	49,400
	Brook trout		27,500	13,400
	Lake trout		8,308	
	White-fish	5,832,000	256,000	
	Pike perch		2,000,000	
	Black bass			4,860
	Crappie			1,500
Rhode Island	Shad		1,000,000	
	Landlocked salmon	10,000		
	Brook trout		23,000	
	Black bass (large-mouth)			2,000
	Black bass (small-mouth)			200
South Carolina	Shad		2,012,000	
	Rainbow trout			400
	Black bass			100
	Crappie			705
South Dakota	Rainbow trout			1,000
	Black-spotted trout			15,000
	Brook trout		123,000	
	Black bass			8,600
	Crappie			30
Tennessee	Rainbow trout			17,500
	Brook trout			19,239
	Black bass			2,400
	Crappie			1,278
Texas	Rainbow trout			500
	Black bass			111,455
	Crappie			3,145
	Rock bass			5,640
	Strawberry bass			2,000
	Bream			300
Utah	Landlocked salmon	10,000		
	Steelhead trout	10,000		
	Brook trout	55,000		
	Lake trout	500,000		
	Grayling	72,000		
Vermont	Landlocked salmon	20,000		19,335
	Steelhead trout		19,650	2,200
	Rainbow trout			1,500
	Brook trout	164,000	483,885	6,209
	Lake trout	300,000	105,000	
	Hybrid trout			1,859
	Grayling		20,000	
	White-fish		400,000	
	Pike perch		12,600,000	
	Black bass			600
Virginia	Shad		27,245,000	
	Rainbow trout			21,876
	Brook trout			1,473
	Black bass			4,845
	Crappie			1,500
	Rock bass			4,200

Distribution of fish and eggs among the States and Territories—Continued.

State or Territory.	Species.	Eggs.	Fry and fingerlings.	Adult and yearlings.
Washington	Quinnat salmon		6,626,947	
	Sockeye or blueback salmon		10,683,000	
	Steelhead trout		26,000	
	Black-spotted trout			67,000
	Brook trout			13,500
	Lake trout		86,692	
	White-fish		160,000	
West Virginia	Rainbow trout	25,000		14,448
	Brook trout	25,000		2,750
	Black bass			6,975
	Crappie			3,500
Wisconsin	Steelhead trout	75,000	15,000	
	Brook trout		20,000	1,000
	Lake trout		2,250,000	
	Grayling		10,000	
	White-fish		12,600,000	
	Black bass			6,500
Wyoming	Steelhead trout	25,000		10,000
	Rainbow trout	45,000		
	Black-spotted trout	75,000		20,000
	Brook trout	110,000		6,000
	Lake trout	250,000		
	Grayling	100,000		
Foreign countries:				
Canada	Lake trout		304,500	
	White-fish		2,000,000	
England	Rainbow trout	20,000		
Ireland	Shad	700,000		
	Rainbow trout	35,000		
New Zealand	Quinnat salmon	250,000		
France	Quinnat salmon	20,000		
Scotland	Rainbow trout	10,000		
	Brook trout	20,000		
	Total	88,682,000	1,070,756,779	4,897,975

Summary of distribution.

Species.	Eggs.	Fry and fingerlings.	Adults and yearlings.	Total.
Shad	36,749,000	202,307,000	2,000,000	241,056,000
Quinnat salmon	3,175,000	16,687,264	1,350	19,863,614
Atlantic salmon	550,000	908,073	541,858	1,999,931
Landlocked salmon	140,000	13,850	508,487	662,337
Silver salmon		146,824		146,824
Sockeye or blueback salmon		10,683,000		10,683,000
Steelhead trout	110,000	301,450	20,414	431,864
Loch Leven trout	20,000	8,000	1,700	29,700
Rainbow trout	255,000	34,103	209,572	498,675
Black-spotted trout	85,000	120,000	737,000	942,000
Brook trout	534,000	1,967,092	195,021	2,696,113
Lake trout	5,050,000	19,577,415	88,650	24,714,065
Scotch sea trout	10,000	35,000	51,647	96,647
Golden trout		6,990		6,990
Hybrid trout			1,959	1,959
Grayling	372,000	2,449,718	10,000	2,831,718
White-fish	16,632,000	321,206,000		337,838,000
Pike perch	25,000,000	64,700,000		89,700,000
Cat-fish			4,024	4,024
Pike			5,000	5,000
Pickerel			185	185
Yellow perch			8,170	8,170
Black bass, large-mouth			282,127	282,127
Black bass, small-mouth			200	200
Crappie			151,653	151,653
Rock bass			18,164	18,164
Strawberry bass			7,544	7,544
Warmouth bass			1,850	1,850
Sun-fish			2,100	2,100
Bream			51,300	51,300
Cod		265,324,000		265,324,000
Flat-fish		87,115,000		87,115,000
Lobster		77,166,000		77,166,000
Total	88,682,000	1,070,756,779	4,897,975	1,164,336,754

RAILROAD TRANSPORTATION.

The five cars of the Commission traveled 101,796 miles in distributing fish, and detached messengers and employees of the stations traveled 157,297 miles. Of the 118,503,583 fish thus transported there was a loss of 50,717.

The Commission is under obligations to the following railroads for material aid in extending the field of its distribution by furnishing free transportation:

Name of railroad.	Cars.	Messengers.	Name of railroad.	Cars.	Messengers.
Alamogordo and Sacramento Mountain Rwy	.....	42	Lake Shore and Michigan Southern Rwy	.....	48
Austin and Northwestern R. R	.....	198	Macon and Birmingham Rwy	.....	150
Bangor and Aroostook R. R	3,018	577	Maine Central R. R	2,204	2,607
Boston and Maine System	.....	2,522	Michigan Central R. R	2,002	.....
Burlington, Cedar Rapids and Northern Rwy	2,233	790	Missouri Pacific Rwy	20	.....
Central Vermont Rwy	.....	530	Mobile and Ohio R. R	1,122	89
Chesapeake and Ohio Rwy	880	125	Montana R. R	.....	112
Chicago and Northwestern Rwy	.....	1,202	Montpelier and Wells River R. R	.....	228
Chicago, Burlington and Quincy R. R	1,698	4,693	Northern Pacific Rwy	6,761	.....
Cleveoand, Cincinnati, Chicaga and St. Louis Rwy	111	.....	Omaha, Kansas City and Eastern R. R	250	.....
Colordo and Southern Rwy	.....	1,123	Oregon Short Line R. R	740	.....
Colorado Midland Rwy	372	942	Pere Marquette R. R	7,680	1,213
Delaware and Hudson Co	384	.....	Plant System	574	.....
Denver and Rio Grande R. R	.....	5,734	Portland and Rumford Falls Rwy	.....	170
Detroit and Mackinac Rwy	646	373	Rio Grande, Sierra Madre and Pacific Rwy	.....	300
El Paso and Northeastern Rwy	326	77	Rutland R. R	.....	384
Florida Central and Peninsular R. R	414	.....	St. Johnsbury and Lake Champlain R. R	.....	397
Florida East Coast Rwy	.....	250	St. Louis and San Francisco R. R	310	38
Franklin and Megantic Rwy	.....	50	St. Louis Southwestern Rwy	125	264
Fort Worth and Denver City Rwy	.....	2,020	San Antonio and Aransas Pass Rwy	.....	348
Grand Rapids and Indiana Rwy	2,570	332	Sandy River R. R	.....	22
Grand Trunk Rwy. System	.....	256	Southern Pacific Co	.....	2,100
Great Northern Rwy	1,535	.....	Texas and Pacific Rwy	2,656	1,449
Gulf, Colorado and Santa Fe Rwy	.....	2,289	Texas Central R. R	.....	157
Houston and Texas Central R. R	.....	353	Vandalia Line	646	.....
Illinois Central R. R	.....	195	Virginia and Southwestern Rwy	.....	32
International and Great Northern R. R	.....	2,937	Wabash R. R	1,452	1,618
Kansas City and Independence Air Line	20	.....	Washington County R. R	204	204
Kansas City, Fort Scott and Memphis R. R	381	.....	West Virginia Central and Pittsburg Rwy	262	14
Kansas City Southern Rwy	838	38	Wilmington and Northern R. R	.....	57
			Wisconsin Central Rwy	514	.....
			Total	42,746	40,239

BIOLOGICAL INQUIRIES.

During the year the Commission has carried on a number of investigations and experiments with the object of giving practical assistance to the oyster industry. The results of the experiments in fattening oysters by increasing, in inclosed waters, the production of their natural food have given considerable encouragement. Oysters planted in the experimental claires at Lynnhaven, Va., reached a degree of fatness unrivaled save in a single limited area of the open waters of that famous oyster field, but they arrived at this condition too late in the season to make the result of immediate practical value. During the coming season certain changes will be made in the plant whereby a better circulation and aeration of the water will be attained. It is expected that this will result not only in an improvement in the general vitality of the oysters and an increase in the reproductive activity of the minute plants upon which they feed, but that the currents created will also place the food more abundantly within the reach of the oysters. The changes in the claire will be completed in time to allow a practical test during the ensuing season.

An investigation was carried on during the winter, with the assistance of the steamer *Fish Hawk*, to determine the reason for the failure of oyster-culture in North Carolina, and is referred to on pp. 119–120.

In August, 1899, Mr. H. F. Moore visited Willapa Bay, Washington, for the purpose of inquiring into the condition of the oysters planted there in 1894. It was found that they had been almost exterminated. At the end of the first year, according to the testimony of the oystermen, a large proportion of those planted had survived and were on the beds. This would indicate that they had not been injured by transportation across the continent. Subsequently, however, they gradually decreased in number, until at the time of Mr. Moore's visit but five oysters were found after a careful search under the guidance of persons familiar with the beds. So far as could be determined this diminution did not result from natural causes, and there is reason to suspect that some of the oystermen in the region have been so indifferent to their own interests and their obligations to the Fish Commission as to view the raiding of the planted beds with a lenient eye. Several private beds in the vicinity are reported to be doing well, but in these cases it is to somebody's immediate interest to protect the planted oysters from poachers.

Owing to the very few oysters taken it was impossible to make experiments in artificial fertilization of the eggs, although two of the females appeared to be ripe. No evidence of natural spawning of the eastern oyster was obtained, and it appeared that the water was too cold to be favorable for their reproductive activity. Culture in shallow inclosed or semi-inclosed ponds appears to be indicated as the most hopeful line of experiment with eastern oysters in this region.

During the year the equipment and facilities at Woods Hole laboratory, which has continued under the direction of Dr. H. C. Bumpus, have greatly improved. The number of able volunteer workers has increased, and much scientific work of practical and theoretical value has been accomplished.

During the summer the steamer *Fish Hawk* has been at the station and rendered important service in the investigation of the marine fauna. The schooner *Grampus* was engaged, under the supervision of the director, in continuing the investigation of the tile-fish, and obtained valuable data concerning its distribution.

Studies were conducted upon clam-culture, the migrations of fish, the economic utilization of certain waste products of the fisheries, the diseases of fishes, and other subjects of importance, which are mentioned in the report of the Division of Inquiry relating to Food-fishes. There is also in preparation a series of papers, which, when completed, will afford to students a much-needed means of identification of the marine animals of the southern coast of New England.

The laboratory at Beaufort was open until September 15, 1899, and was reopened June 1, 1900, and a number of able workers utilized its facilities. The spawning habits of various fishes, sponges, and crustacean parasites were studied, and the basis has been laid for profitable work in the future. At its last session Congress passed an act for the establishment of a permanent biological station on the coast of North Carolina, and as the vicinity of Beaufort offers exceptional advantages it is proposed to locate it at that point.

The urgent deficiency bill approved February 9, 1900, provided for a special investigation concerning the decline of the lobster and clam fisheries, with the object of devising measures for their relief, and in April the following commission was appointed for the purpose of carrying the act into effect: Dr. H. C. Bumpus, chairman; Dr. H. M. Smith, secretary; Mr. William de C. Ravenel, and Capt. E. E. Hahn. Promising results have been already attained with the soft-shell clam (*Mya arenaria*), but the lobster presents greater difficulties and will require comprehensive study.

During the fiscal year investigations of the inland waters to ascertain their biological and physical characteristics, their fitness for the introduction of new species, and the possibility of increasing their productiveness by artificial means have been prosecuted in Maine, New York, Pennsylvania, Ohio, Indiana, Michigan, and North Carolina. While some of the information gathered is capable of local application only, much is of broader significance and applicable to lacustrine waters in general.

Dr. W. C. Kendall continued his work on Sebago Lake, Maine, until about the middle of August, when, at the request of the State board of fish commissioners, he was ordered to Cobbosseecontee Lake, to inquire into the reasons for the nonsuccess of the plants of landlocked salmon which have been made therein. In this connection, a study

was made of the fauna, and the conclusion was reached that the abundance of predaceous fishes and the restricted spawning-grounds were responsible for the failure of the salmon to maintain itself.

The biological survey of Lake Erie was continued during July and August under the direction of Prof. Jacob Reighard: The hatchery at Put-in Bay was used as laboratory and headquarters, but various other parts of the lake were visited by members of the party. An account of the work is elsewhere given in the report.

A comprehensive study of the waters of the hydrographic basin of the Wabash River, Indiana, was undertaken by the Commission during the summer of 1899. A number of the lakes and rivers were studied with some care, but principal attention was paid to Lake Maxinkuckee, in Marshall County. Maxinkuckee is typical of the small glacial lakes of the Upper Mississippi Valley, and it was considered that a thorough investigation of the biological and physical features of its waters would develop facts common to all of the lakes of its class. The work began July 1 and was continued until the latter part of October by a party under the direction of Prof. B. W. Evermann. A topographic and hydrographic survey was begun, meteorological observations were carried on, collections were made illustrative of the flora and fauna of the lake and its immediate environment, and data were obtained concerning the habits and distribution of the various animals, especially the fishes.

Seneca Lake, in New York, and Lake Mattamuskeet, in North Carolina, have been visited and collections of their fishes have been made or arranged for.

Investigations upon the fishes of the principal river basins in West Virginia, begun in 1899, were conducted by a party under Mr. W. P. Hay. The Potomac, Greenbrier, Elk, and especially the Monongahela river systems were well examined. Until recent years these rivers were productive of fine food-fishes, but of late they have become sadly depleted, principally through the denudation of the forest lands, the pollution of the waters, dynamiting, damming of streams, and other changes in the conditions, principally due to industrial operations.

On the Pacific coast the studies of the salmon and other fishes have been continued in the eastern tributaries of the Sacramento. The explorations of the coastal streams begun in previous years have been extended between the northern boundary of California and the Columbia River, and a study of the fishes of the San Pedro River has almost been completed.

Considerable progress upon the study of the collections made by the *Fish Hawk* in Porto Rico during the winter of 1898–99 is reported. The specimens were distributed among a number of specialists, and many of the reports have been received and several are now in progress. These papers will make an important and attractive publication, which it is hoped to issue during the ensuing year.

STATISTICAL INQUIRIES.

During the last calendar year a statistical canvass of the fisheries of the States of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and New York has been in progress. The present amount of capital invested in these fisheries in the New England States is $19,637,036, which, as compared with the figures of the last canvass, made in 1889, shows a decrease of $437,758. But this decrease is only apparent, being caused chiefly by the transfer of the menhaden industry to New York, and, while the relative values of the different catches have changed, the food fisheries of these States have, in the aggregate, increased in quantity and decreased but slightly in value. 35,445 persons are employed and 1,427 vessels, valued with their equipment at $4,224,339. The total product is 393,355,570 pounds, worth $9,672,702—the fishery for cod, cusk, haddock, hake, and pollock ranking first with a value of $2,798,109, followed by the oyster fishery of Rhode Island and Connecticut, worth $1,910,684. The lobster fishery is next in commercial importance, being worth $1,276,900. While the catch has fallen from 30,500,000 pounds in 1889 to 14,660,000 in 1898, a decrease of more than 50 per cent, the price of lobsters has so advanced that the value of the industry has increased a corresponding degree.

The inquiry conducted on Lake Erie in the calendar year 1899 shows a decided increase in the fisheries of this lake since the last canvass, in quantity and value of the product, capital invested, and number of persons employed. This is chiefly shown in the catch of white-fish and lake herring. The yield of pike perch, though large, is not considerably greater than in former years. 3,728 persons and 104 vessels are engaged in the industry, representing an investment of $2,719,600. In 1899, 58,393,000 pounds of products were obtained, worth $1,150,890. A feature of the fisheries is the number of carp which were taken, the catch amounting to over 3,600,000 pounds, valued at $51,400.

On Lake Ontario, where for several years there has been a decided falling off in the commercial fisheries, there was in 1899 found to be a material improvement, the yield being nearly three times as great as in 1897, and it would appear that this region is beginning to feel the effect of the fish-cultural operations which have been conducted here. The number of persons engaged and capital invested are also proportionately greater. The yield in 1899 amounted to nearly 2,500,000 pounds, valued at over $100,000.

The quantity of fishing products landed at Boston and Gloucester shows an increase of more than 33,000,000 pounds, with an increased value of over $1,200,000. The bulk of the increase is to be credited to Gloucester, though the fares landed at Boston are in excess of the year before. The products landed from American vessels at the two ports amounted to 176,774,301 pounds and were valued at nearly $4,200,000.

Inquiries now in progress along the Great Lakes and in the Mississippi Valley show that an increasing number of carp are being caught

and shipped, chiefly to the markets of the larger eastern cities. From Lake Erie and the Ohio River and certain of its tributaries the quantity of this species taken is nine times as great as it was six years ago. From the Illinois River more carp are taken than all other species combined, the catch for 1899 amounting to 6,332,900 pounds, valued at $189,900. It would appear that this fish will become more and more an important factor in the food-fish supply of the country.

As it was not practicable for an agent of the Commission to visit Alaska during the summer of 1899, the customary records of the fur-seal herds were made up from data furnished by the courtesy of the resident Treasury agents. The American herd continues to decrease in numbers through the continuance of pelagic sealing, and the recent counts show that fewer pups are born each year.

STEAMER ALBATROSS.

During the spring of 1899 it was determined to undertake an investigation among the islands of the southern Pacific Ocean, as it was believed important additions to knowledge could be made in regions where comparatively little work had been done. The scientific work was placed in charge of Mr. Alexander Agassiz, who was accompanied by a staff of assistants.

At the beginning of the fiscal year the *Albatross* was prepared for the expedition, and on August 23 she sailed from San Francisco under the command of Commander Jefferson F. Moser, U. S. N., and until early in the spring, when she reached Yokohama, she was engaged in the work of exploration and biological investigation. The Marquesas, Paumotu, Society, Cook, Tonga, Fiji, Ellice, Gilbert, Marshall, Caroline, and Ladrone archipelagoes were visited, and at the various ports every facility and courtesy were extended by the local authorities, and thanks are due to the governments of Great Britain, France, and Germany, which at the request of the Department of State had directed their representatives in their respective possessions to afford any assistance in their power.

These islands were studied in relation to their geological and biological features, and collections were made in the fields of zoology, botany, ethnology, and geology. The director devoted his attention to the study of coral formations and the biological and dynamic factors which have resulted in the production of coral islands; the civilian staff were engaged in biological research, and the naval officers, besides their duties in navigating the ship, in making surveys, soundings, and observations of value to mariners. Collections of the fauna of the deeper waters of the Pacific were made by means of the beam trawl and dredge, and the pelagic life at the surface and intermediate depths was studied. During the cruise about 250 soundings were made, with numerous temperature and density observations. The *Albatross* arrived at Yokohama March 4, and after she was refitted, some collections were made on the coast of Japan, within the

100-fathom line and along the edge of the Black Current, until June 12, when the vessel left for Alaska to continue the commercial investigation of the salmon fisheries, on which she was engaged in 1897.

The full reports of this expedition are not yet ready for publication, but a narrative of the voyage will be found on pp. 137–161 of this volume.

STEAMER FISH HAWK.

During July and August this vessel, under the command of Mate James A. Smith, U. S. N., was employed in making collections of marine fauna off the southern coast of New England in connection with the biological work of the station at Woods Hole, Mass., and in September she was sent to Beaufort, N. C., to assist in the topographic and hydrographic surveys incident to an inquiry into the cause of the failure of the various attempts at oyster-culture which had been made in that State.

As the time during which the vessel could be available was limited, and as it was desired to make the investigation with some degree of thoroughness, it was considered advisable to limit the field of operations, and the regions examined were selected upon the suggestion of Prof. J. A. Holmes, director of the North Carolina geological and natural history survey, who took keen interest in the subject. At first the work was carried on in the vicinity of Beaufort and Morehead, but in December the *Fish Hawk* proceeded to Pamlico Sound, where Swan Quarter Bay and other productive oyster-grounds were examined. Reports upon the work are in course of preparation and will be published.

On March 25 the vessel was detached from this duty in order to prepare for taking up the customary shad work in the Delaware River. Some time was spent in making necessary repairs at Baltimore, and on April 25 she reached her usual anchorage off Gloucester City, N. J., where shad hatching was successfully carried on until the middle of June, when she was ordered to proceed to Woods Hole. The work above referred to is described in detail in the accompanying reports of the divisions of Scientific Inquiry and of Fish-Culture.

NEW STATIONS.

The development of Cold Spring station, near Bullochville, Ga., and of the stations at Edenton, N. C., and Nashua, N. H., has been carried on during the year, and has been sufficient to permit the beginning of fish-cultural operations.

The water supply at Cold Spring is derived from three springs with an aggregate flow estimated at 2,800 gallons per minute and having a temperature of 62° to 64°. The principal spring has been surrounded with a substantial retaining-wall, a distributing-tank and conduits built, and five ponds finished with their supply and outlet pipes. Four of the ponds contain from 6,000 to 12,000 square feet each, and

all aggregate a little over an acre. A large portion of the property has been fenced in, roads built, and the grounds, which were rough and uneven, have been cleared and graded, marshy places filled, and a system of drainage laid out and completed. In the spring plans for a superintendent's dwelling were prepared, which will be a frame building of two stories, 48 by 52 feet, with wide halls and porches and containing seven rooms. Its construction is now in progress.

At Edenton, N. C., five artesian wells with 2-inch pipes were driven, ranging from 50 to 200 feet in depth, which furnished an average flow of about 3 gallons each per minute, the temperature of the water being 64° F. A two-story frame dwelling, 46 by 63 feet, containing eight rooms, has been completed for the superintendent, certain improvements have been made in the hatchery supply system, a supply ditch leading from Pembroke Creek to the boiler house has been completed, and the construction of six bass ponds has been begun.

At Nashua, N. H., a two-story frame residence, 30 by 50 feet, containing eight rooms, a cellar, and attic, has been erected for the superintendent, and additional drainage pipes laid.

MISCELLANEOUS.

For several years it has been very desirable that the Commission should have another steamer of sufficient size and seaworthiness for cruising at considerable distances offshore, in connection with the scientific and fish-cultural work of the New England stations. Accordingly, under authority of an act of Congress approved March 3, 1899, a steamer of 55 tons displacement, 82 feet long, and 16 feet beam was purchased November 23, 1899, and named *Phalarope*. In May she was put in commission, and has given satisfactory service.

There have been added to the library during the year 130 books and 318 pamphlets. The Bulletin for 1898 and the following pamphlet extracts from the Bulletins for 1898 and 1899, and from the Report for 1899, have been issued:

The salmon and salmon fisheries of Alaska. Report of the operations of the U. S. Fish Commission steamer Albatross for the year ending June 30, 1898, by Jefferson F. Moser. Bulletin for 1898, pp. 1-178.

List of fishes known to inhabit the waters of the District of Columbia and vicinity, by Hugh M. Smith and Barton A. Bean. Bulletin for 1898, pp. 179-188.

Notes on the collection of tide-pool fishes from Kadiak Island, Alaska, by Cloudsley Rutter. Bulletin for 1898, pp. 189-192.

The southern spring mackerel fishery of the United States, by Hugh M. Smith. Bulletin for 1898, pp. 193-271.

Notice of file-fish new to the fauna of the United States, by Hugh M. Smith. Bulletin for 1898, pp. 273-278.

The pearly fresh-water mussels of the United States; their habits, enemies, and diseases, with suggestions for their protection, by Charles T. Simpson. Bulletin for 1898, pp. 279-288.

The mussel fishery and pearl-button industry of the Mississippi River, by Hugh M. Smith. Bulletin for 1898, pp. 289-314.

The peripheral nervous system of the bony fishes, by C. Judson Herrick. Bulletin for 1898, pp. 315-320.

The reappearance of the tile-fish, by Hermon C. Bumpus. Bulletin for 1898, pp. 321-333.

The preservation of fishery products for food, by Charles H. Stevenson. Bulletin for 1898, pp. 335-563.

Notes on the foreign fishery trade and local fisheries of Porto Rico, by W. A. Wilcox. Report for 1899, pp. 1-34.
Check-list of the fishes of Florida, by B. W. Evermann and W. C. Kendall. Report for 1899, pp. 35-103.
Statistics of the fisheries of the Gulf States, Division of Statistics, C. H. Townsend, assistant in charge. Report for 1899, pp. 105-169.
Statistics of the fisheries of the South Atlantic States, Division of Statistics, C. H. Townsend, assistant in charge. Report for 1899, pp. 171-227.
An inquiry into the feasibility of introducing useful marine animals into the waters of Great Salt Lake, by H. F. Moore. Report for 1899, pp. 229-250.
A review of the fisheries in the contiguous waters of the State of Washington and British Columbia, by Richard Rathbun. Report for 1899, pp. 251-350.
Experiments in photography of live fishes, by R. W. Shufeldt. Bulletin for 1899, pp. 1-5.
Notes on the tide-pool fishes of California, with a description of four new species, by Arthur White Greeley. Bulletin for 1899, pp. 7-20.
The synaptas of the New England coast, by Hubert Lyman Clark. Bulletin for 1899, pp. 21-31.
Descriptions of new genera and species of fishes from Porto Rico, by B. W. Evermann and M. C. Marsh. Report for 1899, pp. 351-362.

There have been distributed during the year 1,429 bound and 12,394 pamphlet copies of the publications of the Commission.

The Museum of Comparative Zoology at Cambridge, Mass., has published the following additional papers based on the investigations of the steamer *Albatross* in 1891:

Bulletin, vol. XXXV, No. 1, XXVII. Preliminary account of Planktonemertes agassizii, a new pelagic nemertean, by W. McM. Woodworth.
Memoirs, vol. XXIII, No. 2, XXV. The Ophiuridæ, by C. F. Lutken and Th. Mortensen.
Memoirs, vol. XXIV, No. XXVI. The Fishes, by S. Garman.

Appropriations were made by Congress for conducting the operations of the Commission for the year ending June 30, 1900, as follows:

Salaries	$218,000
Miscellaneous expenses:	
Administration	10,000
Propagation of food-fishes	150,000
Inquiry respecting food-fishes	15,000
Statistical inquiry	5,000
Maintenance of vessels	30,500
For improvement of stations at—	
Leadville, Colo	4,000
Woods Hole, Mass.	5,000
For construction of a wharf at Gloucester (Mass.) station	2,500
For purchase of a steam launch for use at New England stations	7,000
For continuing investigations regarding lobsters and clams	7,500

A report of the expenditure of these amounts will be made to Congress, in accordance with law.

GEORGE M. BOWERS, *Commissioner.*