

XXIV.—THE PROPAGATION AND DISTRIBUTION OF SHAD IN 1878.

BY JAMES W. MILNER.

A.—STATION ON ALBEMARLE SOUND.

Encouraged by the success of the apparatus devised by Mr. T. B. Ferguson, Commissioner of Fisheries of Maryland, for hatching shad in tidal waters, it was decided that a renewed experiment should be made in the waters of the Southern States with the improved method. The floating boxes had proved inadequate and unsatisfactory in waters without current.

The region of the numerous fisheries in Albemarle Sound was selected for the point of operations. These, numbering in all about forty, are located on the shores of the sound, principally in the northern and western region and the mouths of the Chowan and Roanoke Rivers, and employ seines from five hundred to twenty-five hundred yards in length. Most of these employ horse-power for hauling in the seines, although several are fitted with fine steam-engines. They are considered as an important part of the plantations and estates upon which they are situated, and a very considerable amount of capital is invested in the enterprise. The preparation of the shore alone is an expensive operation, employing many men, diving experts, and explosives, to clear off the snags, cypress knees, and stumps which are found in the shallower portions of the water.

The fishing for shad and alewives or herring ordinarily begins in March and lasts to the 1st of May, the lower fisheries cutting out several days before the upper ones. Fishing is continued from midnight Sunday evening until midnight Saturday. The fishing in this locality has hitherto been confined almost exclusively to the seines, although of late years pound-nets, or "dutch nets," as they are called in this locality, have been introduced. Pamlico Sound, which is adjacent, is also an extensive fishing region.

The nets visited by our steamers extended from Colerain, on the Chowan, to Drummond Point, on the northern side of the sound, and to Jamesville on the Roanoke, something like thirty fisheries being thus available.

The barges fitted up and used the previous year by Maryland, containing the improved machinery for shad-hatching, were, with the machinery, purchased by the United States commission from the Maryland commission and put in working order. On the 19th day of March the

revenue-steamer Thomas Ewing, Capt. Alvan A. Fengar in command, by instructions from the Secretary of the Treasury, took the fleet in tow and carried it as far as Norfolk, Va. One of the barges was left at this port to be fitted up as a second machinery-scow. A large tug was employed to tow the three barges through the canals, and they arrived on March 26 at the headwaters of Albemarle Sound, near the mouth of the Chowan River, and were anchored in a protected position adjacent to Avoca, the plantation of the Capehart family, which occupies an extent of land lying between the rivers Chowan and Roanoke.

The services of the steamer Lookout, belonging to the Maryland Fish Commission, had been obtained for the work of the season. She was sent to Norfolk in December of 1877, to secure a harbor not liable to be obstructed by ice at the time she might be needed, and by permission of the Secretary of the Navy was kept at the navy-yard. She arrived in Albemarle Sound on the 3d of April. She there rendered efficient service under the direction of Maj. T. B. Ferguson, whose hearty coöperation and assistance were of great moment to the United States Fish Commission. Several trips of the Lookout from Avoca to Washington demonstrated the practicability of carrying eggs and young fish with perfect safety, so far as the steadiness of the cones before referred to is concerned. Notwithstanding the roughness of the sea, the gimbals in which the cones are suspended insure the horizontal position of the surface at whatever angle the deck itself may stand.

Major Ferguson's appointment as one of the United States commissioners to the Paris Exhibition made it necessary for him to break up his connection with the United States Fish Commission about the time of closing the work on Albemarle Sound.

Very important assistance was also rendered in Albemarle Sound by a small open steam-launch furnished to the commission by the Secretary of the Navy; indeed, without it, very much less would have been accomplished. A second launch, derived from the same source, was in use in addition at Havre de Grace.

On the morning of the 28th about eight thousand eggs were taken and put into some Brackett boxes which we had in our outfit. The large seines in the vicinity were in full operation, the two nearest us being those of Avoca Beach and Scotch Hall. These seines were each about twenty-three or twenty-four hundred yards in length. Both of these beaches are on the great Capehart plantation. To Dr. W. R. Capehart and to his father we are indebted for continued aid and active coöperation, which were essential to the success of our work. The previous year, at an outlay of nearly \$650, Dr. Capehart made an experiment with the floating boxes, but because of the lack of current no adequate results were obtained. This year he had a large tank erected, and using one of our pumps with his steam-engine hatched a large number of shad.

Up the Chowan, within a distance of twelve miles, were three or four large seines, and along the northern shore of the sound, in the vicinity

of Edenton, N. C., and Drum Point, were some eight or ten more. At several of these fisheries steam-engines are used in drawing the seine to shore. The catch of shad was quite limited, thirty to one hundred being near an average haul, while the alewives were very numerous.

On April 1, a general move was made for obtaining shad ova. On this day two hundred thousand eggs were taken, and from this time on a considerable number of eggs were obtained up to the 1st of May, the number reaching 10,387,000. The largest number of eggs taken in any one night was on the 15th of April, when eighty-two shad were stripped, affording what were estimated at 1,605,000 eggs. On the 17th fifty-nine ripe shad were stripped, and on the 18th, seventy-six.

A singular fact attending the work of gathering spawn was the concentration of the spawning fish upon the Avoca Beach, the one nearest to our station; so constant was this that fully four-fifths of the eggs taken were obtained at this one point, although the fisheries for twelve miles up the Chowan, and for fifteen miles along the northern shore, and five or six miles up the Roanoke River, were visited. As usual the bulk of the spawn was taken at night, the largest amount being brought from the seines coming to shore about an hour after dark; a few are taken in the morning, but it seems to be the uniform law that scarcely any are taken after broad daylight. Albemarle Sound proves to be one of the best localities for shad production that has been tried, as the numerous large seines are continuously hauled from Monday morning (midnight) to Saturday midnight of each week. There is no tide in the vicinity, and the hauling is not delayed at any time, as all hours of the day and night are favorable.

The shipment of fish to remoter points began April 11. Correspondence and a conference with the commissioner of Virginia, Col. Marshall McDonal, and of North Carolina, Col. L. L. Polk, had resulted in their assuming the distribution of young fishes to the waters of their States at a distance from the vicinity. The first shipment was made to Nottaway Mills, Va., into the Nottaway, tributary to the Chowan River, at that date. From that time to May 2, when this work closed, 4,926,500 young fish were distributed; of these, 2,145,500 were put into the immediate waters; 1,039,000 were distributed in other waters within the State, making 3,184,500 young put into the waters of North Carolina; 1,142,000 were sent into Virginia, while in other States 600,000 were planted. The accompanying tables will show the details of the gathering of eggs and of the distribution of the fish from the Avoca station.

Although in every respect the region of operations was most admirably adapted to furnishing a large number of young shad, it proved to be rather inaccessible for railroad travel in the distribution of fish. Two steamboats connect it with Franklin, a point on the Seaboard and Roanoke Railroad, within the Virginia line, and about seventy miles distant from our station; but in shipping fish it was necessary to send them by the steam-launch to an outside pier where they remained in

charge of the attendants until the steamer came. No telegraph communication could be had nearer than Franklin.

As already remarked, the seine fisheries of this region are on the most extensive scale of any locality in the country; although a single seine on the Potomac exceeds any one on the Albemarle Sound in dimensions, still the average length of seines in the Albemarle Sound is greater and there are more of them. The system of fishing is a very good one, most of the seine proprietors finding it possible to employ the same gang of hands each succeeding year. This, of course, affords them the advantage of a trained and experienced force, which is a matter of much consequence.

At the Scotch Hall fishery on the Capehart plantation, where steam-engines are used, a system of signals is employed with the steam-whistle, through which the men are called to any point necessary, and the position of the seine can be known by the proprietor, while in his office or at his home, by the special signals given at different intervals.

Where the outlay is large and the labor bill great, as it is at these steam-fisheries, it is found essential to have the material in the outfit of superior quality, so that there may be little liability of delay through breakage or accident. A peculiar line is used at these fisheries, imported from Russia, made expressly for the Russian navy, and said to be used only in two or three industries in the United States, one the Albemarle Sound fisheries and another in oil-well drilling.

Some of these fisheries have proved very profitable to their owners. One is referred to, the sum of the profits from which for nine years was \$55,000. A table showing the catch at Scotch Hall fishery for a series of years is appended.

Large shoals of rock-fish or striped bass visit the shores later in the year. A remarkable haul made on one of Dr. Capehart's shores in 1876 yielded 35,000 fish. Many of these weighed 80 and 90 pounds, and 365 of them had a total weight of 23,785 pounds, an average of 65 pounds. This year the run of shad into the sound was very light; only one haul of consequence was heard of, this being when 998 were taken at Avoca Beach on the 17th of April.

It may not be generally known that the waters of Albemarle Sound are entirely fresh from Roanoke Island to the head of the sound, the inlets from the sea being so small that very little salt water is introduced; the large rivers emptying into it also prevent the tides from having much effect upon the water; Pamlico Sound has a larger area of salt water.

Early in April it was announced that large hauls of herring were being made in Pamlico Sound; about the middle of April large catches were made at the lower fisheries in Albemarle Sound, and from that on till the 1st of May the nets were crowded with herring. The run was unprecedented, the older fishermen asserting that nothing equal to it had ever occurred; one of the nets of Mr. Peter Warren took at one

haul 400,000. The northern shore of the sound and the Chowan River seemed to be in the direct course of the fish; later they struck the net at Avoca Beach; the best haul made at this point was 165,000. Scotch Hall, about three miles nearer the mouth of the Roanoke River, did not seem to be in the range of the fish; they ascended the Roanoke in much more moderate numbers, though all that the fishermen desired and more could be taken. The herring crowded the waters of the sound to such an extent that they seemed to drive the shad and other fishes away, and the catch of shad became even smaller than it had been. The steamers from Franklin came daily freighted with salt and went back loaded heavily with salted herring; the prices dropped very rapidly until they were offered in some instances at 50 cents a thousand at the beach. The women employed to dress the salted herring worked night and day, and a large increase of the force was made at most fisheries. It was impossible in these immense hauls to take care of all of the fish, and frequently a large surplus was carted away from the beach to spread on the fields as manure.

No satisfactory theory suggests itself for this immense increase in the herring. The seines stopped fishing eight or ten days earlier than usual because of this immense influx of herring, as the prices became lower for every additional hundred thousand salted.

A change in the run of the shoals of fish at different points, from year to year, is observed here as it is in many other places and with other species of fish. It is impossible to say whether this is owing to an alteration in the contours of the bottom from the heavy storms, or to a change in the distribution of the food of the fishes, or to a question of temperature, but it is a fact that certain shores, which in a series of years have gained notoriety for great yields of fish, subsequently diminish in value, and other stations supplant them in this respect.

The facilities for hatching fish which were at our command were, first, the apparatus first used in the season of 1877, namely, a barge, on the outside of which levers protruded from air-ports; from the bows were suspended buckets, an up-and-down movement being afforded these by means of eccentrics, which from their irregular form, with one long side and one short side, produced a sudden drop and a slow rise; this apparatus is the well-known invention of Major Ferguson. Cones were arranged along the sides of the housing which covered the scow; two large casks were raised on a platform to an elevation higher than the top of the cones, and were filled by a pump run by the same engine which propelled the shafting. An improvement was made on the cones at the suggestion of Mr. F. N. Clark, which obviated the continual attention required in skimming off foul matter, shells of eggs, and the like, which continually clogged the perforations in the inner rim, and produced an overflow of eggs and fishes from the cones. By means of Mr. Clark's contrivance the specific gravity of sound eggs, at a properly regulated pressure, caused them to remain some distance be-

low the surface; the refuse matter, including the *Saprolegnia*, constantly flowed off. The engine was worked night and day. When the stock on hand was small the engineers also attended at night to the cylinders and cones, but during the height of the season, when everything was filled, night and day attendants were required. Some little difficulty was at first experienced with the cylinders in time of storm, a very little increase in wind or wave occasioning too much agitation of the water and eggs within the cylinders, and our first warning of this danger was the loss of over 300,000 eggs, by a strong wind and sea setting against the cylinders containing them on one side of the barge. This we were afterward able to prevent in part by stopping the machinery and allowing the wave alone to give the movement to the eggs within the cylinders. A screen or breakwater might, however, easily be devised by placing a frame work outside the cylinders, reaching a little below the water, and nailing or fastening to it either canvas or thin boards; not being prepared with this device during the present season, it was thought best to use the cones to the largest extent before utilizing the cylinders, and sometimes, when bad weather threatened, we took the precaution to remove the eggs and fish from the cylinders to the cones inside the building, if any of them happened at the time to be empty, as was explained in my report of 1877. Very much less loss was experienced by this apparatus than could be expected from any form of floating box where only side currents are to be depended on.

Where a continual river current is found, the cheaper floating boxes may be used quite as efficiently, except for the greater area required; but the larger portion of the shad-spawning grounds being within tide-water and where currents are very slight, the great advantage of this certain and constant agitation of the water is readily appreciated.

As in all artificial propagation of fishes the presence of a skillful expert is necessary; trusting the work to beginners and those who have little experience and ability in fish-hatching will afford as small results as it does with any other apparatus.

A small experiment was made with the Chase jar. This Mr. Oren M. Chase has used at Detroit for the past four years in hatching white-fish. It was found to work with quite as much efficiency in hatching shad, and it is quite probable that with some modifications to suit the different conditions of shad-hatching it would be found to excel everything else in the concentration of space and hatching a very large quantity of eggs in masses contained in quite small vessels.

A device invented by one of the working members of the corps, Mr. W. T. Wroten, also deserves notice. It embodies the principle of the Chase jar, except that instead of applying the current through a rubber tube and diffusing it from the center of the vessel it is applied through vertical funnels or channels on the sides of the vessel, forcing the water in through a narrow space or slot extending round the bottom. This is an advantage in the fact that the vessel being made sufficiently small—

to contain about fifteen or eighteen quarts—can be carried out in the boats, and the spawn as soon as it is impregnated and “rises” can be immediately turned into this bucket, where it can receive much better care before reaching the hatching station, and the vessel can then be placed where a stream of water can be introduced, and the entire operation, from the time the eggs are impregnated to the time the fish are taken out, can be carried on in the vessel without transferring or moving the eggs.

The experimental device of Mr. Wroten is a little crude in its construction, but with another year's use, and the improvements which will be suggested, it is quite likely to be considered as a valuable acquisition to the apparatus for fish-hatching.

The Maryland yacht Lookout, which was at the station, had also, on its forward decks, six cones which were employed in hatching eggs and in two efforts to transport large quantities of fish to the waters of the Potomac and streams in Virginia and Maryland.

At Avoca station a few experiments were made in taking herring-spawn, with very good success; the variety was the so-called glut or small-eyed herring, which here runs high up the streams; the larger-eyed herring remaining down the bay—an instance of opposed habits in the same species in different regions, as in the Potomac the so-called branch herring runs up the streams, and the glut remains in the open waters. The eggs were handled in precisely the same manner as those of the shad; they had rather a tendency to adhere to the sides of the pan or whatever they touched, but still with a little pains were washed free, and were put into the buckets to hatch the same way as the shad. The young were very minute, and it was impossible to keep them in the vessels, because they were small enough to slip through; the wire-cloth that we had in use being only twenty-four meshes to the inch.

About the end of April the large seines began to cut out, the great flood of herring making it unprofitable to continue fishing, as the shad all abandoned the shores.

On the 29th of April, the revenue-cutter E. A. Stevens reported for duty in affording facilities for our work. As the last seine, the one at Avoca Beach, which had proved so profitable to our work, was to cut out on the 1st of May, and the steamer Lookout was at hand expecting to carry back a large stock of fish and eggs to the Potomac River, it was determined to get rid of all the young fish on hand and have the Stevens tow the barges as far as Norfolk, if not farther. On the morning of the 2d of May the barges were tied behind the steamer, and we started down the Sound, lying over at night in the narrow cut south of the entrance to the Albemarle and Chesapeake Canal. On the morning of the 4th we reached the navy-yard at Norfolk, having had some trouble in getting through the shoal passages and cuts with the long string of barges. We were tied to the anchor-buoys at the navy-yard, and the steamer returned to Albemarle Sound. About four o'clock the same afternoon the revenue-

utter Thomas Ewing arrived with instructions to take one of the barges and a steam-launch to Havre de Grace. Captain Fengar, however, obligingly consented to take two barges instead of one. The wind rising to a gale he put off starting until the next morning; but at an early hour on the 5th the cutter got under way with the two barges and one launch in tow; the remaining barge was taken into the dock and tied in one of the slips at the navy-yard.

On the 7th the steam-launch of the Franklin was sent alongside, Mr. Kullman, a machinist from the steamer, coming with it to act as engineer; on the evening of this day I came on to Washington, leaving the two barges and the steam-launch to be towed up to Havre de Grace on the return of the revenue-cutter Ewing. On her second trip this steamer left Norfolk on the 9th of May and took the remaining barges and the launch in tow for Havre de Grace. Going up the bay they encountered a strong wind and sea, and were for a time in considerable danger; at about midnight the wind rose to quite a gale and the steamer ran into the Great Wicomico River for harbor; the launch, however, parted her hawsers and went adrift; as it was impracticable to turn around with the two scows, she had to drift along until they were anchored, when the steamer went out and found her after some search and took her into the harbor.

B.—STATION NEAR HAVRE DE GRACE, MARYLAND.

The barges arrived on the 11th of May at Havre de Grace. I had been for twenty-four hours awaiting them. They were anchored in the Narrows in about the same place they were last year.

As we were well supplied with steam-launches and facilities for obtaining spawn from the different seines and nets, I concluded that the steamer Lookout could be best utilized by being sent to the Potomac to work the fisheries of that river, as she possessed considerable capacity in the cones on her forward deck for the care of eggs. Captain Chester accordingly left with the Lookout on the morning of the 15th of May.

The first eggs were taken on the 17th of May, the number being 25,000; the total number from that day until the 11th of June obtained at this station was 12,730,000. The greatest number gathered in one day was 1,940,000, on the 29th of May, from 97 spawners. On the 27th 65 good spawners, and on the 28th 71 were taken, this period seeming to be the climax of the spawning season.

The first shipment to a distant stream was made on the 15th of May—150,000 shad—to the Tombigbee River in Mississippi. The total number shipped to other States from this point was 2,535,000; the number put in at this station and in immediate waters, 5,105,000; and the number put in other streams of Maryland and in the Potomac River, 1,705,000, making a total of 9,345,000 fishes.

Mr. Thomas Hughtlett, of Easton, Md., State Commissioner of Fish-

eries, took the responsibility of a considerable portion of the State distribution and afforded efficient aid to our work.

C.—POTOMAC RIVER STATION.

Captain Chester succeeded in obtaining 1,430,000 eggs on the Potomac River, a portion of which were put in the river and two shipments made to other waters of Virginia. The results of his work are shown in the tables.

D.—GENERAL RESULTS.

The total number of eggs taken for the year at Avoca and Havre de Grace stations, and the Potomac River was 24,547,000; from these about 14,521,000 fishes were distributed, or about 60 per cent., which is of course small, the losses before the machinery was complete accounting for most of it.

The success of the work was, however, great enough to meet all special requisitions, and it was deemed unnecessary to establish a station at any point further north. A shipment of 150,000 shad was sent on the 11th of June to Sacramento River, California, going through with great success. This is the fourth shipment made to that river by the United States Commission in co-operation with the State, a previous one in 1871 having been made under the auspices of the State alone.

The results from placing shad into the Sacramento River, where they had no previous existence, are of the most encouraging character, as the number of shad taken has increased yearly, so that in the present year it makes a considerable item in the Sacramento fish market.

The news of continued captures has also been heard from Louisville, Ky., and a few points on the Mississippi River. Shad were taken in the month of March at Wetumpka, on the Coosa River. The run of shad at Louisville began about the 1st of May, and closed about the 20th; the greatest number being taken between the 10th and 18th, as near as could be learned by the Fish Commissioner.

TABLES OF SHAD PROPAGATION AND DISTRIBUTION IN 1878.

Record of shad-hatching operations conducted at Avoca, N. C., on Albemarle Sound, from March 28, 1878, to May 1, 1878, on account of the United States and Maryland Fish Commissions.

Date.	Hour.	Temperature of—			Wind.		Condition of—		Rip o fish.		Eggs obtained.
		Air.	Surface water.	Bottom.	Direction.	Intensity.	Sky.	Water.	Males.	Females.	
March 28	12 m.	60	60	60	SW.		Cloudy.	Muddy.	2	2	10,000
29	12 m.	60	60	60	NE.		Fair	do			
30	12 m.	60	60	60	NE.		Cloudy.	do			
31	12 m.	75	62	63	SW.		Fair	do			
April 1	12 m.	62	63	63	NY.		do	do	20	12	225,000
2	12 m.	74	61	61	NEE		do	do	12	14	183,000
3	12 m.	65	61	61	ENE.		Cloudy.	do	30	18	238,000
4	12 m.	53	60	58	NE.		do	do	2	1	20,000

620 REPORT OF COMMISSIONER OF FISH AND FISHERIES.

Record of shad-hatching operations conducted at Avoca, N. C., on Albemarle Sound, from March 23, 1878, to May 1, 1878—Continued.

Date.	Hour.	Temperature of—			Wind.		Condition of—		Rise of fish.		Eggs obtained.
		Air.	Surface water.	Bottom.	Direction.	Intensity.	Sky.	Water.	Males.	Females.	
April	5.....	12 m.	63	58	57	NNW.	Clear	Muddy.	2	1	20,000
	6.....	12 m.	56	57½	57	NW.	Cloudy.	do	0	6	120,000
7.....	12 m.	64	58½	57	W.	Clear	do			185,000	
8.....	12 m.	62	61	58	ENE.	do	Clear	16	11	240,000	
9.....	12 m.	67	61	58½	SEE.	Cloudy.	do		18	320,000	
10.....	12 m.	64	60	58	.....	Rainy.	do		16	
11.....	7 a.m.	63	61	58	W.	Misty	do				
	12 m.	68	64	58	NE.	Clear	do				
12.....	7 p.m.	65	63	58	SW.	Cloudy.	do		5	100,000	
	7 a.m.	54	59	58	WSW.	Fair	do				
13.....	12 m.	77	63	60	W.	Clear	do				
	7 p.m.	64	61	59	Calm.	do	do		8	140,000	
14.....	7 a.m.	69	62½	59	WSW.	do	do				
	12 m.	79	64	60	.....	do	do			
15.....	7 p.m.	60	64	63	W.	do	do		19	380,000	
	7 a.m.	64	62	61	NEE.	Hazy	do				
16.....	12 m.	68	66	63½	E.	do	do				
	7 p.m.	60½	65½	63	E.	do	do				
17.....	7 a.m.	60½	65	63	NE.	Cloudy.	do				
	12 m.	66½	66	62½	.....	do	do			
18.....	7 p.m.	60½	65½	62	.....	do	do	83		1,605,000
	7 a.m.	56	64	61	NNW.	do	do				
19.....	12 m.	56	60½	60	NNW.	Strong	do				
	7 p.m.	53	59	59½	NNW.	do	do		59	1,160,000	
20.....	7 a.m.	56	59	56	NW.	do	do				
	12 m.	64	60½	57	NW.	do	do				
21.....	7 p.m.	53	63	58	.....	do	do			
	7 a.m.	51	61	58	.....	do	do			
22.....	12 m.	55	63	60	.....	do	do			
	7 p.m.	55	64	60½	.....	do	do		76	1,405,000
23.....	7 a.m.	58	62	59	.....	do	do			
	12 m.	72	64	60	.....	Fair	Clear			
24.....	7 p.m.	61	66	60	.....	do	do		27	540,000
	7 a.m.	60	61	60½	.....	do	do			
25.....	12 m.	78	64	63	.....	Cloudy.	do			
	7 p.m.	65	64	61½	.....	do	do		11	190,000
26.....	7 a.m.	69	64	62½	.....	Clear	Clear			
	12 m.	78	71	60½	.....	do	do			
27.....	7 p.m.	68	70	61	.....	do	do			
	7 a.m.	65	65	62½	.....	Calm	do			
28.....	12 m.	77	71	62½	.....	do	do			
	7 p.m.	75	72	63	.....	Fresh	do		27	540,000
29.....	7 a.m.	70	66	62	.....	Light.	Cloudy.			
	12 m.	79	70	66	.....	Brisk.	do			
30.....	7 p.m.	75	67	65	.....	Light.	Fair		81	610,000
	7 a.m.	72	66	62½	.....	do	Cloudy			
31.....	12 m.	76	67	60	.....	Brisk.	do			
	7 p.m.	64	66	65	.....	do	do		1	20,000
April	1.....	12 m.	78	67	65	Light.	Cloudy			
	2.....	12 m.	78	67	65	Brisk.	do		22	440,000
2.....	7 p.m.	64	67	64½	.....	Calm	Clear			
	7 a.m.	64	65	64½	.....	do	do			
3.....	12 m.	80	71	65½	.....	Light.	Fair		4	80,000
	7 p.m.	67	67	65	.....	.....	.....	
4.....	12 m.	85	76	65½	.....	.....	.....	
	7 p.m.	77	70	68	.....	.....	.....		20	400,000
5.....	7 a.m.	65	70	67	.....	.....	.....	
	12 m.	80	76	68	.....	.....	.....	
6.....	7 p.m.	68	70½	67½	.....	Slight	Fair			
	7 a.m.	59	67	67½	.....	Calm	do			
7.....	12 m.	71	70	68½	.....	Slight	do			
	7 p.m.	60	69	69	.....	Calm	Clear		42	820,000
8.....	7 a.m.	70	70	67	.....	do	Fair			
	12 m.	81	72	67½	.....	do	do			
9.....	7 p.m.	66	72	70	.....	do	do			165,000
	7 a.m.	64	70	69	.....	do	do			
10.....	12 m.	83	76	70	.....	do	do			100,000

Record of shad-hatching operations conducted at Havre de Grace, Md., on the Susquehanna River, from May 7, 1878, to June 12, 1878, on account of the United States and Maryland Fish Commissions.

Date.	Hour.	Temperature of—			Wind.		Condition of—		Ripe fish.		Eggs obtained.
		Air.	Surface water.	Bottom.	Direction.	Intensity.	Sky.	Water.	Males.	Females.	
May 7, 8, 9, & 10		°	°	°						20	385, 000
12.....	7 a. m.										
	12 m.										
	8 p. m.	56	61½		Calm	Strong	Cloudy	Clear			
13.....	7 a. m.	50	62	57	Fresh	Fair	Fair	Roily			
	12 m.	59	62	59	Fresh	Fair	Fair	do			
	8 p. m.	53	60	58	Slight	Cloudy	Cloudy	do	3	60, 000	
14.....	7 a. m.	50	59	57½	do	do	do	do			
	12 m.	51½	59	57½	Calm	do	do	do			
	8 p. m.	50	57	57½	Fresh	do	do	do	1	20, 000	
15.....	7 a. m.	46	56	56½	do	do	do	do			
	12 m.	52	56½	55	do	do	do	do			
	8 p. m.	53½	57	55	Calm	Fair	Fair	do	3	60, 000	
16.....	7 a. m.	53	60½	55½	Fresh	do	do	do			
	12 m.	61	62	57	Slight	do	do	do			
	8 p. m.	60	59½	57	do	do	Cloudy	do			
17.....	7 a. m.	50	60	57	do	do	do	do			
	12 m.	60	61	57	do	do	do	do			
	8 p. m.	57	60	57	do	do	do	do	7	150, 000	
18.....	7 a. m.	57	59½	57½	Calm	Fair	Fair	do			
	12 m.										
	8 p. m.	62	65½	62	Slight	do	Clear	Roily	2	40, 000	
19.....	7 a. m.	61	60	59	do	do	Fair	do			
	12 m.	70	64	63	do	do	Clear	do			
	8 p. m.	60	63½	63	do	do	Fair	do	3	60, 000	
20.....	7 a. m.	60	63½	63	do	do	Cloudy	Clear			
	12 m.	65½	64	63	do	do	do	do			
	8 p. m.	64	64½	63	Strong	do	do	do	26	520, 000	
21.....	7 a. m.	66	64½	63	Fresh	do	do	do			
	12 m.	73	68	63½	Calm	Fair	Fair	do			
	8 p. m.								29	580, 000	
22.....	7 a. m.	57	63	62½	Fresh	do	Fair	Clear			
	12 m.	64	65	65	do	do	Clear	Roily			
	8 p. m.	66½	67½	65	Slight	do	do	do	31	620, 000	
23.....	7 a. m.										
	12 m.										
	8 p. m.								23	470, 000	
24.....	7 a. m.	70	67½	65	Calm	do	Cloudy	Clear			
	12 m.	73	70	66	do	do	do	do			
	8 p. m.	66½	68	66	do	do	do	do	44	880, 000	
25.....	7 a. m.	65	68	65½	do	do	do	do			
	12 m.	74	70½	67	do	do	do	do			
	8 p. m.								27	540, 000	
26.....	7 a. m.										
	12 m.										
	8 p. m.								38	760, 000	
27.....	7 a. m.										
	12 m.										
	8 p. m.										
28.....	7 a. m.								05	1, 300, 000	
	12 m.								71	1, 430, 000	
	8 p. m.								97	1, 940, 000	
29.....	7 a. m.										
June 1.....	7 a. m.				Gale	do	Cloudy	Roily			
	12 m.				do	do	do	do			
	8 p. m.				do	do	do	do			
2.....	7 a. m.	70	66	63	Strong	do	do	do			
	12 m.	72	66	63	Fresh	do	do	do			
	8 p. m.	70	65½	63	Slight	do	do	do	4	80, 000	
3.....	7 a. m.	69	65	63	do	do	do	do			
	12 m.	70½	67½	65	do	do	Fair	Clearing			
	8 p. m.	68	71	67	Calm	do	Clear	Clear	53	1, 060, 000	
4.....	7 a. m.	71	69	66	Slight	do	Cloudy	do			
	12 m.	70	69	66½	do	do	Fair	do			
	8 p. m.	74	72	68	Fresh	do	Cloudy	do	40	750, 000	
5.....	7 a. m.	72	71	68	do	do	Fair	do			
	12 m.	77	72	69½	do	do	Cloudy	do			
	8 p. m.	66	72	69	Strong	do	Clear	do			
6.....	7 a. m.	62	68½	66	do	do	Hazy	do			
	12 m.	66	74	71	Fresh	do	do	Roily			
	8 p. m.	65	74	71	Calm	do	Clear	do	20	300, 000	
7.....	7 a. m.	66	72	69	Slight	do	do	do			
	12 m.	73	74	72	do	do	Fair	do			

622 REPORT OF COMMISSIONER OF FISH AND FISHERIES.

Record of shad-hatching operations conducted at Havre de Grace, Md., &c.—Continued.

Date.	Hour.	Temperature of—			Wind.		Condition of—		Ripe fish.		Eggs obtained.
		Air.	Surface water.	Bottom.	Direction.	Intensity.	Sky.	Water.	Males.	Females.	
June 7	8 p. m.	69	72	70		Fresh	Hazy	Clear			
	11 a. m.	70	71	68		Slight	Cloudy	do			200,000
9	12 m.										
	8 p. m.	72	70½	68		Slight	Cloudy	Roily		8	120,000
	7 a. m.	68	70	67		Fresh	Cloudy	Clear			
10	12 m.	72	72	70		Slight	Fair	do			
	8 p. m.	65	73	70		Calm	Cloudy	do		12	200,000
	7 a. m.	65	71	68		do	do	do			
11	12 m.	69	72	69		Slight	do	do			
	8 p. m.									7	125,000
12	7 a. m.										
	12 m.										
	8 p. m.	66	70	68½		Fresh	Fair	Clear		5	80,000
	7 a. m.	63½	68½	66		Slight	Hazy	do			

Record of ahad-hatching operations on the Potomac River, from May 16, 1878, to June 3, 1878, on account of the United States and Maryland Fish Commissions.

Date.	Hour.	Temperature of—		Wind.		Condition of—		Seine hauled.	Fish taken.		Ripe fish.		Eggs obtained.	Remarks.
		Air.	Surface water.	Direction.	Intensity.	Sky.	Water.		Males.	Females.	Males.	Females.		
May	6 p.m.	49	61	NW.	Fresh	Clear	Roily	4 p. m.	120					
	7 a.m.	59	55½	SSW.	do	Cloudy								
	7 a.m.	60	59	SSW.	Light	Clear	Clear							Four hauls a day, averaging 100 ahad, but none ripe.
	7 a.m.	59½	60	SW.	do	do	do	10 a. m.	160	40				
	12 m.	61	61½	S.	Fresh	Cloudy	do	5 p. m.	60	30		2	45,000	
	6 p.m.	60½	62	SE.	Light	do	Roily	11 p. m.	70	30		1	5,000	
	7 a.m.	60½	62	S.	do	do	Rain, fog	11 a. m.	150	75				
	12 m.	62	62½	S.	do	do	Roily							
	6 p.m.	65	63½	S.	do	Clear	Clear	6.30 p. m.	100	65		1	10,000	
	7 a.m.	66½	64	NW.	do	do	do	May 20, 11 p. m.	160			3	60,000	
	12 m.	68	69	S.	do	do	do	6 a. m.	110	40				
	7 p.m.			W.	do	do	do	11.40 a. m.	175	45		1	20,000	
22	7 a.m.	64	66	NW.	Fresh	do		7 p. m.	80	6				Seine broke and fish escaped.
	12 m.	69	67	NW.	do	do		7 a. m.	7		1	20,000		Put 50,000 young ahad in Neapoco Creek.
	6 p.m.	65	72	NNW.	Light	do		1 p. m.	110	40		1	20,000	
23	7 a.m.	64	66	NW.	do	do		7 a. m.	40	10				Left Keystone Point in steamer at 10 a. m.; went up to Chapman's fishery; found they were not fishing; returned and anchored near Indian Head.
	6 p.m.	67	69		Calm	do	Clear	5.36 p. m.	787		19	400,000		
24	7 a.m.	68	66½		do	Cloudy	do							
	12 m.	73	66½	SE.	Fresh	do	do							
	7 p.m.	68	66		Calm	do	do	6.30 p. m.	600		29	500,000		
25	7 a.m.	67	66	NW.	Light	do	do	8 p. m.	200		11	220,000		Moved to Washington, D. C., and anchored off Eighth street wharf.
29	6 p.m.	63	72	W.	do	Clear	do	10.30 p. m.			3	50,000		Taken at Glymont.
												60,000		Taken from gillern.
														Heavy squalls from north and northwest; over 100,000 eggs lost from wooden boxes.
30	7 a.m.	66	70	SSW.	Fresh	Clear	Clear							
	12 m.	65	72	SSW.	do	do	do							
	7 p.m.	69	73	N.	Strong	Rain								
31	7 a.m.	63	70	NW.	Fresh	Cloudy		1 a. m.	240					
	12 m.	67	71	NW.	do	do		11.40 a. m.	350					Heavy squall on the river from northwest at 4 p. m.
	6 p.m.	60	71	NW.	do	do	Roily							Last haul of the season.
June	7 a.m.	62	70	NW.	do	do		1 a. m.	100					
	12 m.	65	69	N.	Gale	do								
2	6 p.m.	64	69	N.	Fresh	do								
	7 a.m.	64	68	NNE.	do	do								
	12 m.	65	68	NNE.	do	do								
3	6 p.m.	66	68	NNE.	do	do						20,000		Taken from gillern.
	7 a.m.	67	67	NE.	Light	do								
	6 p.m.	72	70	E.	do	Clear								

624 REPORT OF COMMISSIONER OF FISH AND FISHERIES.

Statistics of fisheries at Avoca, N. C.

Date.	Number days fished.	Shad.			Rock.		
		Number taken.	Best day's work.	Best haul.	Number taken.	Best day's work.	Best haul.
1869.							
March	26	9,084	March 30, 3,290	March 30, 1,218			
April	26	85,556					
May	12	6,238					
Total	64	50,828					
1870.							
March	25	6,907	2,163	787			
April	26	22,082					
May	9	7,590					
Total	60	36,579					
1871.							
March	20	9,509	April 11, 2,239	April 12, 1,241			
April	26	19,693					
May	6	1,677					
Total	52	30,879					
1872.							
March	20	2,940	April 11, 7,857	April 10, 3,289	1,073	May 1, 700	
April	26	40,488					
May	7	4,916					
Total	53	48,344					
1873.							
March	21	8,793	April 5, 7,640	April 5, 2,550	1,955	April 8, 2,800	800
April	26	40,670					
May	11	7,814					
Total	58	57,277					
1874.							
March	23	23,604	April 9, 6,243	April 4, 3,210			
April	26	40,842					
May	10	8,650					
Total	59	79,096					
1875.							
March	22	16,171	2,561	1,224			
April	25	34,485					
May		10,827					
Total		61,483					
1876.							
March	26	6,068	April 28, 1,010	April 28, 505	3,875	May 6, 48,100	35,000
April	26	22,356					
May	10	7,831					
Total	62	37,155			85,782		
1877.							
March	18	7,499	April 21, 1,365	April 21, 524	1,318	March 26, 1,175	700
April	20	12,950					
May	15	3,791					
Total	50	24,240					
1878.							
March		4,744	March 10, 830	March 10, 363	3,018	March 30, 800	
April		5,543			7,973		
Total		10,287					

* Many of this catch weighed 80 to 90 pounds; 365 of them weighed 23,725 pounds.

Number of hauls made during one week, 1868, and number of shad caught.

Date.	First haul.	Second haul.	Third haul.	Fourth haul.	Fifth haul.	Total.
1868.						
April 6.....	920	1,330	550	693	520	4,013
7.....	352	384	860	940	1,377	3,913
8.....	1,341	1,329	1,200	1,941	.....	5,811
9.....	1,078	2,215	1,704	.....	.....	5,597
10.....	1,600	2,722	1,850	760	376	7,317
11.....	1,052	2,900	4,777	1,850	.....	10,579
Total shad caught one week.....	.....	.....	.....	.....	.....	37,230

Record of distribution of young shad made from April 11, 1878, to June 14, 1878, by United States and Maryland Commissions on Fish and Fisheries.

Date of transfer.	Place whence taken.	Number of fish.		Introduction of fish.				Transfer in charge of-
		Originally taken.	Actually planted.	State.	Town or place.	Stream.	Tributary of-	
1878								
April 11	Salmon Creek, near Avoca, Albemarle Sound, North Carolina (at mouth of Chowan River).	2,500	2,500	North Carolina	Avoca	Salmon Creek	Chowan River	U. S. F. C.
April 11		111,000	111,000	Virginia	Nottoway Mills	Nottoway River	do	W. G. Williamson.
April 11		139,000	139,000	North Carolina	Weldon	Roanoke River	Albemarle Sound	Do.
April 12		100,000	100,000	do	Neuse Station	Neuse River	Pamlico Sound	S. G. Worth.
April 12		150,000	150,000	do	Railroad crossing	Meherrin River	Chowan River	W. G. Williamson.
April 13		144,000	144,000	Mississippi	Vaughn Station	Big Black River	Mississippi River	C. W. Schuermann.
April 13		116,000	116,000	Alabama	Demopolis	Tombigby River	Mobile River	J. F. Ellis.
April 13		115,000	115,000	Virginia	Richmond	James River	Chesapeake Bay	H. B. Nicholas.
April 15		120,000	120,000	North Carolina	The Mill	Salmon Creek	Chowan River	U. S. F. C.
April 20		100,000	50,000	do	Raleigh	Neuse River	Pamlico Sound	H. E. Quinn.
April 21		700,000	100,000	Maryland	Several points	Potomac River	Chesapeake Bay	William Hamlen.
April 22		50,000	40,000	Virginia	Railroad crossing Seaboard and Roanoke Railroad.	South branch Nausemond River.	James River	H. B. Nicholas.
April 22		do	100,000	North Carolina		Tar River	Pamlico Sound	Thomas Taylor.
April 23		do	100,000	Mississippi	Friar's Point	Sunflower River	Yazoo River	J. F. Ellis.
April 23	do	40,000	do	Holly Springs	Cold Water River	do	C. W. Schuermann.	
April 23	do	40,000	do	Railroad crossing	Tallahatchie River	do	Do.	
April 23	do	40,000	do	Grenada	Yalabusha River	do	Do.	
April 24	do	100,000	Virginia	Salem	Roanoke River	Albemarle Sound	W. F. Page.	
April 24	do	800,000	North Carolina	Avoca	Salmon Creek	Chowan River	U. S. F. C.	
April 24	do	100,000	do	Lockville	Cape Fear River	Atlantic Ocean	Col. L. L. Polk.	
April 25	do	60,000	Georgia	Macon	Ocmulgee River	Altamaha River	H. E. Quinn.	
April 25	do	60,000	do	Albany	Flint River	Appalachicola River	Do.	
April 25	do	200,000	North Carolina	Avoca	Salmon Creek	Chowan River	U. S. F. C.	
April 25	do	200,000	do	Coleraine	Chowan River	Albemarle Sound	Do.	
April 26	do	115,000	do	Scotch Hall	Albemarle Sound	Atlantic Ocean	Do.	
April 25	do	85,000	Virginia	Petersburg	Appomattox River	James River	H. B. Nicholas.	
April 26	do	250,000	North Carolina	Plymouth	Roanoke River	Albemarle Sound	U. S. F. C.	
April 26	do	25,000	do	Avoca	Chowan River	do	Do.	
April 26	do	70,000	do	Scotch Hall	Albemarle Sound	Atlantic Ocean	Do.	
April 26	do	200,000	do	Franklin	Blackwater River	Chowan River	Thomas Taylor.	
April 28	do	300,000	do	Avoca	Salmon Creek	do	U. S. F. C.	
April 29	do	18,000	do	do	do	do	Do.	
April 30	do	100,000	Virginia	Milford Station	Mattapony River	York River	H. B. Nicholas.	
May 1	do	100,000	do	do	do	do	H. D. Johnson.	
May 1	do	100,000	do	Taylorsville	Little River	South Anna River	W. F. Page.	
May 1	do	45,000	North Carolina	Avoca	Salmon Creek	Chowan River	U. S. F. C.	
May 1	do	335,000	Maryland	Potomac Point	Potomac River	Chesapeake Bay	William Hamlen.	

May 2	do	150,000	150,000	North Carolina	Franklin	Blackwater River	Chowan River	Thomas Taylor.
May 2	do	100,000	100,000	do	do	do	do	Do.
May 2	do	200,000	200,000	do	do	do	do	U. S. F. C.
May 3	do	50,000	50,000	Virginia	Seaboard and Roanoke Railroad crossing.	South branch Nansmond River.	James River	Page and Johnson.
May 15	Havre de Grace	90,000	90,000	Mississippi	Fullon	Tombigby River	Mobile River	J. F. Ellis.
May 15	do	60,000	60,000	do	Aberdeen	do	do	Do.
May 17	do	100,000	100,000	Maryland	Greensborough	Choptank River	Chesapeake Bay	Thomas Hughlett.
May 18	do	50,000	50,000	Tennessee	Humboldt	Middle Fork of Forked Deer.	Forked Deer River	H. E. Quinn.
May 18	do	50,000	50,000	do	Huntingdon	South Fork of Obton River	Mississippi River	Do.
May 20	do	120,000	120,000	Missouri	Neosho	Shoal Creek	Arkansas River	C. W. Schuermann.
May 23	do	100,000	100,000	Mississippi	Meridian	Okatiebe Creek	Chickasawha River	R. E. Earl.
May 23	Steamer Lookout (Potomac River).	50,000	50,000	Maryland	Neapaico Creek	Potomac River	Chesapeake Bay	U. S. F. C.
May 23	do	50,000	50,000	Virginia	Freestone	do	do	Do.
May 24	Havre de Grace	100,000	100,000	Maryland	Federalsburg	Nanticoke River	do	Thomas Hughlett.
May 24	do	100,000	100,000	Alabama	Pollard	Escambia River	Pensacola Bay	F. A. Ingalls.
May 24	Steamer Lookout	75,000	75,000	Maryland	Glymont	Potomac River	Chesapeake Bay	U. S. F. C.
May 25	Havre de Grace	150,000	150,000	do	Havre de Grace	Susquehanna River	do	Do.
May 25	do	150,000	150,000	Georgia	Montezuma	Flint River	Appalachicola River	J. F. Ellis.
May 26	do	350,000	350,000	Maryland	Bull's Mountain	Northeast River	Chesapeake Bay	U. S. F. C.
May 26	do	60,000	60,000	Kentucky	Somerset	Cumberland River	Ohio River	H. E. Quinn.
May 26	do	60,000	60,000	do	McKinney's Station	Green River	do	Do.
May 26	do	100,000	100,000	Maryland	Havre de Grace	Susquehanna River	Chesapeake Bay	U. S. F. C.
May 27	do	100,000	100,000	Louisiana	Ticketaw	Amite River	Lake Pontchartrain	W. M. Russ.
May 27	do	100,000	100,000	Illinois	Farlow	Kaskaskia River	Mississippi River	C. W. Schuermann.
May 27	do	200,000	200,000	Maryland	Havre de Grace	Spoutie Narrows	Chesapeake Bay	U. S. F. C.
May 27	do	400,000	400,000	District of Columbia.	Washington	Potomac River	do	Do.
May 28	do	400,000	400,000	Maryland	Havre de Grace	Spoutie Narrows	do	Do.
May 28	do	200,000	200,000	Virginia	Riverton	Shenandoah River	Potomac River	W. F. Page.
May 28	Steamer Lookout.	100,000	100,000	Maryland	Fort Washington	Potomac River	Chesapeake Bay	U. S. F. C.
May 28	do	300,000	300,000	do	Glymont	do	do	Do.
May 29	Havre de Grace	175,000	175,000	do	Salisbury	Wicomico River	do	Thomas Hughlett.
May 29	do	75,000	75,000	do	Princess Anne	Manokin River	Tangier Sound	Do.
May 29	do	1,500,000	1,500,000	do	Havre de Grace	Spoutie Narrows	Chesapeake Bay	U. S. F. C.
May 30	do	500,000	500,000	do	do	do	do	Do.
May 31	do	250,000	250,000	do	Millington	Chester River	do	Thomas Hughlett.
June 1	do	175,000	175,000	Kentucky	High Bridge	do	do	F. A. Ingalls.
June 1	do	50,000	50,000	South Carolina.	Railroad crossing	Great Pee Dee River.	Winyaw Bay	S. G. Worth.
June 1	do	50,000	50,000	do	Columbia	Broad River	Santee River	Do.
June 1	do	100,000	100,000	Indiana	Elkhart	Elkhart River	Lake Michigan	J. F. Ellis.
June 1	do	50,000	50,000	Arkansas	Benton	Sabine River	Wabasha River	H. E. Quinn.
June 1	do	50,000	50,000	do	Arkadelphia	Caddo Creek	do	Do.
June 1	do	175,000	175,000	Virginia	Shadwell	Rivanna River	James River	W. F. Page.
June 1	do	50,000	50,000	Maryland	Easton	Tread Haven	Choptank River	S. M. Rixey.
June 1	do	75,000	75,000	do	Near Easton	Miles River	Eastern Bay	Do.
June 1	do	500,000	500,000	do	Havre de Grace	Spoutie Narrows	Chesapeake Bay	U. S. F. C.
June 2	do	100,000	100,000	Illinois	Rickford	Rock River	Mississippi River	C. W. Schuermann.
June 3	do	500,000	500,000	Maryland	Havre de Grace	Spoutie Narrows	Chesapeake Bay	U. S. F. C.
June 3	do	100,000	100,000	do	Greensborough	Choptank River	do	S. M. Rixey.

Record of distribution of young shad, &c.—Continued.

Date of transfer.	Place whence taken.	Number of fish.		Introduction of fish.				Transfer in charge of—
		Originally taken.	Actually planted.	State.	Town or place.	Stream.	Tributary of—	
1878								
June 3	Havre de Grace...	50,000	50,000	Maryland	Hillsborough	Tuckahoe River	Choptank River	S. M. Rixey.
June 3	...do	100,000	100,000	Kentucky	Bowling Green	Green River	Ohio River	William Russ.
June 4	Steamer Lookout.	150,000	150,000	Virginia	Waynesboro	South River	Shenandoah River	W. F. Page.
June 5	Havre de Grace...	150,000	150,000	Maryland	Laurel	Patuxent River	Chesapeake Bay	J. M. Donaldson.
June 6	...do	150,000	150,000	...do	...do	...do	...do	David Scott.
June 6	...do	500,000	500,000	...do	Havre de Grace	Speontie Narrows	...do	U. S. F. C.
June 7	...do	50,000	50,000	North Carolina	Salisbury	Yadkin River	Great Pee Dee River	S. G. Worth.
June 7	...do	50,000	50,000	...do	Catawba Station	Catawba River	Santee River	Do.
June 8	...do	100,000	24,000	Iowa	Cedar Rapids	Des Moines River	Mississippi River	B. F. Shaw.
June 8	...do		36,000	Iowa	Logan	Boyer River	...do	Do.
June 8	...do	100,000	100,000	Missouri	Saint Louis	Mississippi River	Gulf of Mexico	F. A. Ingalls.
June 9	...do	125,000	60,000	Ohio	Fremont	Sandusky River	Lake Erie	H. E. Quinn.
June 9	...do		65,000	Indiana	Terre Haute	Wabash River	Ohio River	Do.
June 9	...do	100,000	50,000	Illinois	Charleston	Embarras River	Wabash River	W. H. Hines.
June 9	...do		50,000	...do	Marion	Mississinowa River	...do	Do.
June 9	...do	100,000	50,000	Georgia	Cartersville	Etowah River	Coosa River	J. M. Donaldson.
June 9	...do		50,000	Alabama	Salisbury	Tallahassee River	Alabama River	Do.
June 10	...do	150,000	150,000	Maryland	Snow Hill	Pocomoke River	Chesapeake Bay	S. M. Rixey.
June 10	...do	150,000	150,000	...do	Railroad crossing	Brush River	...do	W. F. Page.
June 10	...do	100,000	100,000	...do	Havre de Grace	Speontie Narrows	...do	U. S. F. C.
June 11	...do	185,000	185,000	...do	...do	...do	...do	Do.
June 11	...do	150,000	150,000	California	Tehama	Sacramento River	Pacific Ocean	T. N. Clark.
June 14	...do	80,000	80,000	Maryland	Cockeyville	Gunpowder River	Chesapeake Bay	N. Simmons.
June 14	...do	120,000	120,000	...do	Havre de Grace	Speontie Narrows	...do	U. S. F. C.
		16,680,500	15,700,500					