

III.—REPORT OF OPERATIONS AT THE SHAD-HATCHING STATION ON BATTERY ISLAND, NEAR HAVRE DE GRACE, MD., DURING THE SEASON OF 1886.

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[Abstract.]

The first run of shad was perceived on April 18, and 35 ripe shad were taken on April 19. This run continued for a week, and was larger in number than had been known for 20 years. Both shad and herring came in enormous quantities. It was impossible to obtain the catch of shad at the seines during this run. The catch of Mr. Osmond's seine in shad for one day alone was more than 5,000.

The collection of spawn for the station was done by men and boys hired temporarily for the purpose. As many as 40 men and boys in addition to the station's ordinary force were employed. These were paid monthly wages, each being allowed \$10 a month for subsistence. It was endeavored to station men permanently at all the seines, and to attend to as many gill-nets as possible. The men were graded as first and second class spawn-takers, and apprentices. Besides these, boys were used merely as oarsmen.

Experience shows, however, that it will be better in the future to employ 3 men to every boat, 2 of whom are apprentices; these 2 to take nightly turns at receiving instruction. Boys, unless quite large and strong, cannot care for boats in a squall. Large as was the collecting force it could not attend to more than one-half of the gilling boats on nights when all of the fishermen were out. As a rule it was found more profitable to attend gill-nets than seines.

Collection was continued from April 19 to June 10, the total number of eggs collected being 60,766,000. Of this number there were received from the steamer Fish Hawk 2,099,000, and from the steamer Lookout 2,433,000, the total received from other sources thus being 4,532,000.

The Commission's gill-nets were put in use during the latter part of the season, there being no scarcity of male fish during the first part. Notwithstanding the smaller mesh of the net, it was not noticed that there was a large difference from other nets in the proportion of male fish caught. The largest roe fish seen during the season was caught in one of the Commission's small-mesh gill-nets. On a few occasions these nets served a good purpose in supplying male fish for impregnating eggs, but they did not supply these male fish nearly so often as they were supplied from ordinary nets near at hand. The Commission's gill-nets, being fished by expert fishermen, caught about as many fish, both male and female, as most of the gill-nets fishing in the same locality.

At the beginning of the season the hatching department was not prepared to do the work that was forced upon it by the early and immense

run of shad. The connections for the hatching apparatus and for the water supply were inadequate to the demand, and the supply of hatching apparatus on hand was insufficient. To increase the hatching room an addition, covered with canvas, was made, accommodating 2 tables additional with 50 McDonald jars. The store-room used for the seine was furnished with sky-lights, and 28 hatching cones were placed in it, and about 30 cones in all conditions of repair were hastily fitted up outside of all shelter. Notwithstanding the increase thus made, the cones and jars constantly carried twice as many eggs as they should have done, and much loss was the result. But by far the greater loss was caused by being obliged to allow eggs brought in to stand in buckets, &c., until room could be made for them. In many cases eggs nearly hatched were compelled to be placed in the river to make room for new ones. About 170 McDonald jars and 58 cones were in constant use, supplemented by wire-gauze cylinders, buckets, pans, and all kinds of arrangements for hatching.

Three experts were employed during most of the season in the hatching-house. Three apprentices were also employed most of the time as assistants. These men received and cared for all eggs, cared for the fish when hatched, filled the cans for shipment, and loaded them in the launch or scow.

Notwithstanding the losses, the number of shad fry hatched was 45,231,000. These numbers are based on the measurement of the perfectly cleaned eggs in the jars just before hatching in every case, and are as nearly accurate as these figures can be made. It is believed that this is rather under than over the actual result. The percentage of hatching during the season was 74.4. The total number of fry shipped and receipted for by messengers was 43,776,000. The total loss of fish was 1,455,000. Three tables are appended to this report, which give details concerning the collection of the eggs, the shipments of the fry, and meteorological observations during most of the season.

The collecting force was entirely disbanded after June 10, when gilling is no longer permitted by Maryland laws. On June 13 all the eggs on hand had hatched, and the hatching department was then closed. But few eggs, however, were taken after June 1, the date on which the greater part of the force was discharged. After the close of the hatching season the time of the small number remaining was given to storing the equipment, and in work upon a drive-well, which was begun with the hope of finding an artesian water supply. This well was carried to a depth of about 150 feet by July 1.

There is little doubt but that the area of 4 or 5 square miles immediately surrounding Battery Station is as large as any, if not the largest, spawning ground for shad on the coast. The station is well located for reaching every part of this ground. The possibilities of the station are almost unlimited. Fishermen and fishing boats cover the bay during the season, and every ripe egg taken in fish in the nets would be

lost if it was not taken by the collectors of the station, impregnated, and hatched. One need only to see the bay studded with the lights of the fishing boats on a night in May to convince him that but for the Commission's work very few fish could come from eggs naturally deposited. But, large as was the Commission's force last year, I am satisfied that not over one-half of the ripe fish taken in the bay by fishermen were stripped by its collectors, as they could not possibly attend to all.

It is fairly demonstrated by this season's work that collecting from gilliers produces a better result than hauling the Commission's seine. Two or 3 men can secure as many ripe fish from gilliers in a day as 30 men would secure if employed in hauling the seine. Moreover, hauling the seine by the employees of the station necessarily involves the Fish Commission in the care and disposal of the fish taken, while it seems to antagonize the fishermen, and is an unnecessary cost. With a good run of fish in the coming year, if the collecting force is doubled and their work thoroughly systematized, perhaps double the number of eggs secured last season can be obtained during 1887. The collection of eggs in 1886 was stimulated also by giving small rewards to those gathering the greatest amount of good spawn.

PENNING SHAD.—Out of a large number of shad full of roe, but not ripe at the time of introduction, which were placed in the pool and kept for a space of time ranging from a few days to 2 weeks, not one ever produced eggs that would hatch, though apparently ripe when stripped. It would seem that possibly the fright at being taken in the net, or of confinement in the pool, prevents the eggs from further development. All of the fish placed in the pool become more or less diseased after a short time, which may be due partly to the muddy bottom. This interesting experiment has hitherto met with such small success as to warrant its being dropped hereafter.

HERRING.—Herring were taken continually and sometimes in such quantities as to retard the hauling of the seines. No account was kept of them, as they were considered valueless in most cases, and they were shoveled back dead into the river or allowed to escape through the large meshes before completely hauling in the seine.

ROCKFISH OR STRIPED BASS.—Experiments were made in hatching the eggs of the rockfish, the greatest success being obtained by swinging a cylinder with gauze ends in a sluice-way through which a current, caused by the tide, constantly flowed. It appears, however, that even with very fine gauze the eggs in a certain state are forced through. Owing to want of time, caused by pressure of other matters, sufficient attention could not be devoted to these experiments, and most of the eggs taken were lost. In all, 600,000 rockfish eggs were taken, and 75,000 fry were shipped to Lake Ontario, near Oswego, N. Y.*

WASHINGTON, D. C., *December 20, 1886.*

* For notice of their successful planting, see F. C. Bulletin for 1886, p. 137.

TABLE I.—Record of the shad-hatching operations conducted at Battery Station, Maryland, from April 19 to June 13, 1886, under direction of L. R. Grabill, superintendent.

Date.		Fish obtained from—		Taken by haul-seines.†		Taken by gill-nets.	Ripe shad.		Eggs obtained.	Loss.		Fish hatched.‡	Fish deposited in local waters.	Fish deposited in other waters.
Day of week.	Day of month.	Length of haul-seines visited.*	Length of gill-nets visited.	Shad.	Rockfish.	Shad.	Males.	Females.		Eggs.	Fish.			
		Fathoms.	Fathoms.	Pounds.										
Monday	Apr. 19	2,500	2,190	3,587		816	20	39	1,782,000	170,000				
Tuesday	Apr. 20	2,200	1,955	2,188		620	35	71	3,112,000					
Wednesday	Apr. 21	2,700	3,200	2,600		1,389	45	91	3,899,000					
Thursday	Apr. 22	2,700	6,425	1,700		2,009	90	145	4,859,000					
Friday	Apr. 23	2,500	4,582	1,500	400	1,144	56	119	3,780,000	763,000				
Saturday	Apr. 24	1,800	1,625	1,000		244	10	17	467,000	375,000				
Sunday	Apr. 25		4,150			767	20	36	785,000	422,000		1,327,000	25,000	
Monday	Apr. 26	800	5,725	484		521	20	28	1,228,000	338,000		2,119,000	1,421,000	
Tuesday	Apr. 27	800	5,420	168		588	35	50	1,475,000			2,431,000	2,431,000	
Wednesday	Apr. 28	1,500	5,505	191	300	693	30	47	1,541,000			3,064,000	860,000	71,500,000
Thursday	Apr. 29	1,900	4,870	1,056		306	20	30	1,040,000		\$169,000	1,000,000	1,053,000	
Friday	Apr. 30	2,000	5,430	1,199	500	405	20	23	1,013,000		\$277,000	1,177,000	50,000	101,430,000
Saturday	May 1	1,500	2,875	175		324		22	1,179,000			200,000		1,200,000
Sunday	May 2		4,150			398		19	13,070,000	150,000	150,000	771,000		
Monday	May 3	1,700	11,390	2,437	800	2,314		123	3,594,000			1,500,000	121,952,000	1,621,000
Tuesday	May 4	2,300	8,625	1,315	500	2,311		210	5,648,000			20,000		
Wednesday	May 5	2,600	8,550	1,850		1,954		110	4,046,000			10,000	804,000	1,500,000
Thursday	May 6	1,800	9,510	1,325	300	894		108	3,295,000			10,000	1,103,000	503,000
Friday	May 7	1,800	2,700	450	200	104		31	944,000				742,000	
Saturday	May 8											1,000,000		500,000
Sunday	May 9	1,100	2,250	200		60		4	112,000			10,000	2,156,000	141,650,000
Monday	May 10	2,600	1,850	334	200	40		3	192,000	66,000		50,000	2,000,000	2,000,000
Tuesday	May 11	2,600	4,200	413	600	41		4	127,000			40,000	3,000,000	2,400,000
Wednesday	May 12	1,800	4,550	135	50	99		5	193,000			30,000	1,593,000	1,500,000
Thursday	May 13	2,500	1,525	243	100	21		1	248,000			6,000	1,300,000	1,900,000
Friday	May 14	2,800	9,100	333	150	238		26	828,000			20,000	1,700,000	172,350,000
Saturday	May 15	1,600	600	230	100	12		6	265,000	33,000		1,370,000	370,000	
Sunday	May 16											20,000	300,000	450,000
Monday	May 17	2,800	5,850	300	250	148		10	305,000	50,000		20,000	414,000	300,000
Tuesday	May 18	3,600	7,150	502	75	152		43	1,469,000	138,000		30,000	130,000	1,050,000
Wednesday	May 19	2,900	11,785	400	100	377		61	1,710,000	482,000		30,000		990,000
Thursday	May 20	1,100	8,425			240		50	1,544,000	295,000			200,000	
Friday	May 21	2,300	6,400	40	25	198		41	1,317,000	269,000		10,000	300,000	300,000
Saturday	May 22	1,100	4,035	266		211		40	1,070,000	196,000			700,000	
Sunday	May 23		1,650			48		9	265,300				245,000	

Monday	May 24	1,300	3,150	50	¹⁸ 150	211	25	622,000	123,000	30,000	1,500,000	895,000		
Tuesday	May 25		750			24	4	60,000	45,000		1,255,000			
Wednesday	May 26		600			20				60,000	1,000,000	2,336,000		
Thursday	May 27		600			4				30,000	1,013,000	977,000		
Friday	May 28	1,300	780	60	¹⁹ 150	16	4	158,000	31,000	20,000	1,000,000	1,500,000		
Saturday	May 29	1,300	1,100	23	¹⁹ 100					30,000		1,100,000		
Sunday	May 30					35	5	112,000	21,000	10,000	200,000	200,000		
Monday	May 31		1,850			134	22	508,000	96,000	20,000	499,000	550,000		
Tuesday	June 1		1,750			99	14	259,000		20,000	45,000	500,000		
Wednesday	June 2		1,100			61	22	545,000	²⁰ 134,000		100,000			
Thursday	June 3		1,150			31	8	189,000			124,000			
Friday	June 4		1,250			18	6	64,000			100,000			
Saturday	June 5		700			28	3	82,000		10,000	177,000	²¹ 228,000		
Sunday	June 6		200			5	3	78,000			416,000			
Monday	June 7		1,100			123	19	476,000		20,000	312,000	²¹ 429,000		
Tuesday	June 8		1,750			111	16	371,000			151,000			
Wednesday	June 9		400			3				20,000	147,000	²¹ 472,000		
Thursday	June 10		200			2				10,000	78,000	²¹ 298,000		
Friday	June 11										403,000			
Saturday	June 12									20,000	256,000	²¹ 481,000		
Sunday	June 13									10,000		²¹ 256,000		
										²² 343,000				
Total		65,800	185,777	26,754	5,050	20,611	401	1,783	60,766,000	3,888,000	1,455,000	45,231,000	14,727,000	29,049,000

* Records for the haul-seines are very incomplete. No hauling of seines is allowed by Maryland law after June 1.

† Herring were taken in great numbers, but no account of them was kept.

¹74.4 per cent of all eggs taken were hatched.

²Kept too long in buckets.

³No room for them in hatching-house.

⁴Kept on shore all night.

⁵Not good.

⁶Put on trays in refrigerator because hatching-house was full.

⁶Fifty thousand eggs sent to H. C. Mercer, to be put into Danube River.

⁷Sent to car No. 1.

⁸Eighty thousand hatched from 200,000 eggs in refrigerator, and died in a few hours; 89,000 lost by overflow of aquariums.

⁹Lost by overflow of aquariums.

¹⁰Shipped by car No. 1.

¹¹From steamer Fish Hawk, 2,099,000.

¹²On account of lack of water.

¹³Eggs nearly hatched and put overboard to make room.

¹⁴Also 585,000 eggs in best condition received this day.

¹⁵Also received 600,000 rockfish eggs.

¹⁶From steamer Lookout, 992,000.

¹⁷Also shipped 73,000 rockfish to Oswego, N. Y.

¹⁸Two hundred pounds of other fish taken.

¹⁹Five hundred pounds of other fish taken.

²⁰Over mature

²¹Deposited in Susquehanna River, for want of means of removal.

²²Not assignable to particular date or dates.

TABLE II.—Record of meteorological observations made at Battery Station, Maryland, from May 1 to June 12, 1886, by William P. Sauerhoff and D. W. Kenly.

Date.	Temperature of air.			Temperature of surface water.			Temperature of bottom.			Direction of wind.			Intensity of wind.			Condition of sky.			Condition of water.	State of tide.		
	7 a. m.	4 p. m.	11 p. m.	7 a. m.	4 p. m.	11 p. m.	7 a. m.	4 p. m.	11 p. m.	7 a. m.	4 p. m.	11 p. m.	7 a. m.	4 p. m.	11 p. m.	7 a. m.	4 p. m.	11 p. m.		7 a. m.	4 p. m.	11 p. m.
May 1.....	56	59	59	61	60	59	61	60	59	NE.	NE.	N.	Strong	Strong	Fresh	Cloudy	Cloudy	Cloudy	Clear	High	Ebb	Ebb.
21.....	57	66	61	57	62	60	57	62	60	N.	E.	SE.	Fresh	Light	Light	do	do	do	do	Flood	Flood	Do.
3.....	60	66	66	60	64	64	60	64	64	SW.	SW.	SW.	Light	do	do	Clear	Clear	Clear	do	do	do	Do.
4.....	67	67	65	64	64	64	64	64	64	SW.	SW.	SW.	do	do	do	do	do	do	do	do	do	Do.
5.....	62	70	67	64	65	64	64	65	64	S.	NW.	W.	do	Fresh	do	do	do	Cloudy	Muddy	do	Ebb	Do.
6 ²	65	68	64	64	65	64	64	65	64	SE.	SW.	S.	Fresh	Light	do	Cloudy	do	Clear	Clear	do	do	Do.
7 ³	63	63	60	63	65	62	63	65	62	E.	E.	E.	Light	Strong	Strong	do	Cloudy	Cloudy	Muddy	Ebb	do	Flood.
8 ⁴	59	59	58	62	60	62	60	60	60	NE.	N.	NW.	Strong	do	Light	do	do	Clear	do	do	do	Do.
9 ⁵	55	62	62	56	60	60	56	60	60	NW.	NW.	NW.	Fresh	Calm	Calm	Clear	Clear	Cloudy	do	do	do	Do.
10 ⁶	60	62	63	60	60	60	60	60	60	NE.	N.	SE.	Light	Light	Light	do	Cloudy	do	do	do	do	Do.
11.....	59	62	60	59	60	60	59	60	60	NE.	N.	SE.	do	do	Strong	Cloudy	do	do	do	do	do	Do.
12.....	59	62	60	59	62	61	59	62	61	SE.	SE.	SE.	do	Calm	Light	do	do	do	do	do	do	Do.
13 ⁷	58	57	58	58	58	58	58	58	58	NE.	NE.	NE.	do	Fresh	do	do	do	Clear	do	do	do	Low.
14 ⁸	57	57	58	58	58	58	58	58	58	SE.	SE.	SE.	do	Light	Fresh	do	do	Cloudy	do	do	Flood	Ebb.
15 ⁸	57	59	60	58	59	60	58	59	60	SE.	SE.	SE.	Fresh	Calm	Calm	do	do	do	do	do	do	Do.
16 ⁹	58	59	57	58	60	58	58	60	58	NW.	NW.	NW.	Strong	Strong	Light	Clear	Clear	do	Flood	do	Flood.	
17 ¹⁰	54	59	57	57	60	58	57	60	58	NW.	N.	SE.	Light	Light	do	Clear	do	do	do	Ebb	Flood.	
18 ¹¹	55	60	58	57	61	61	57	61	61	S.	SW.	S.	do	Brisk	Fresh	do	do	do	do	Flood	Ebb.	
19 ¹²	59	63	60	59	61 ¹	60 ¹	59	61 ¹	60 ¹	S.	S.	S.	do	do	Light	Cloudy	do	Clear	do	do	Do.	
20 ¹³	58	74	68	60	62 ¹	61 ¹	60	62 ¹	61 ¹	SE.	SW.	NW.	do	do	do	do	do	do	do	Ebb	Do.	
21.....	63	72	64	60 ¹	64	62	60 ¹	64	62	S.	S.	S.	do	do	do	do	do	do	do	do	do	Do.
22.....	65	74	70	62	66	66	62	66	66	NW.	E.	E.	do	do	Calm	Clear	Clear	do	do	do	Flood.	
23.....	67	74	71	65	69	69	65	69	69	SW.	SW.	SW.	do	do	Strong	do	do	Cloudy	do	Ebb	do	Do.
23 ¹⁴	68	66	68	68 ¹	68	69	68 ¹	68	69	SW.	NW.	NE.	do	do	Light	do	Cloudy	do	do	do	do	Do.
24 ¹⁵	68	66	68	68 ¹	68	69	68 ¹	68	69	SW.	NW.	NE.	do	do	do	do	do	do	do	do	do	Do.
25.....	68	59	59	68	68	65	68	68	65	N.	NW.	NW.	do	Fresh	Strong	Cloudy	do	Clear	do	do	do	Do.
26.....	54	59	59	65	64	62	65	64	62	NW.	NW.	NW.	Fresh	do	Light	Clear	Clear	do	Muddy	do	do	Do.
27 ¹⁶	58	62	64	60	64	63	60	64	63	S.	S.	S.	NW.	Light	Light	do	Cloudy	do	do	do	do	Ebb.
28.....	60	67	64	60	65	64	60	65	64	N.	N.	N.	do	do	do	Clear	do	do	Clear	do	do	Flood.
29.....	63	71	67	63	68	65	63	67	64	NW.	SW.	SW.	Calm	do	do	do	do	do	do	do	Flood	Ebb.
30.....	65	72	72	64	69	66	64	69	66	S.	S.	NE.	do	do	do	do	do	do	do	do	Flood	Flood.
31.....	69			66			66			NE.			Light			Cloudy						Flood.
June 1.....	61	70	65	65	66	65	64	66	65	NW.	NW.	NW.	Calm	Light	Light	Clear	Clear	Clear	do	do	Ebb	Ebb.
2 ¹⁷	60	78	71	65	70	70	65	70	70	NE.	SW.	SW.	Light	Brisk	do	Cloudy	Cloudy	do	do	do	do	Do.
3 ¹⁸	71	68	65	69	70	68	69	70	68	SW.	NW.	NW.	Brisk	Light	Brisk	do	Clear	do	do	do	do	Do.
4 ¹⁹	63	70	65	65	70	68	65	70	68	NW.	W.	W.	do	Very lt.	do	Clear	do	do	do	do	do	Do.

5	65	77	66	68	68	68	68	68	E.	E.	SE.	Very l't.	do	Light	do	do	do	do	do	Flood.
6	68	77	65	68	69	68	68	69	S.	S.	do	do	do	do	do	do	do	do	Ebb	Do.
7 ²⁰	65	70 1/2	70	69	71	70	69	71	70	SE.	SE.	Light	Light	do	do	do	do	do	do	Do.
8	73	75	72	71	74	73	71	74	73	N.	N.	do	do	do	do	do	do	do	do	Do.
9 ²¹	69	71	72	73	73	73	73	73	73	S.	SE.	SW.	do	Fresh	do	do	Cloudy	Cloudy	do	Do.
10 ²²	71	76	77	72	76	75	72	76	75	NW.	SW.	N.	do	Light	do	Cloudy	Clear	do	do	Flood.
11	77	76	78	78	76	75	78	76	75	N.	NW.	N.	do	do	do	Clear	do	do	do	Ebb.
12	71	78	71	76	76	75	76	76	75	NE.	N.	SE.	do	do	do	do	do	do	do	Do.

- ¹ Tide very low; no water in tank from 2 a. m. to 3.18 a. m.
- ² Rain from 4 a. m. to 6.30 a. m.
- ³ Rain at 11 a. m.
- ⁴ Rain; stopped at 4 p. m.
- ⁵ Water very muddy.
- ⁶ Rain from 10.20 p. m. to 11 p. m.
- ⁷ Rain from 6.30 a. m. to 9.15 p. m.
- ⁸ Rain from 6.30 p. m. to 11 p. m.

- ⁹ Strong wind and current, making ebb run over its time.
- ¹⁰ Water began to clear at 4 p. m.; current falling fast.
- ¹¹ Rain at 11 p. m.
- ¹² Stopped raining at 9 a. m.
- ¹³ Rain from 4 a. m. to 2.45 p. m.
- ¹⁴ Rain from 1.15 a. m. to 3.45 a. m.
- ¹⁵ Rain from 11.50 a. m. to 2 p. m.
- ¹⁶ Rain from 8.45 a. m. to 11.45 a. m.

- ¹⁷ Day rather warm; light drizzle in early morning.
- ¹⁸ West wind making very high tides.
- ¹⁹ Wind blowing northwest for several days kept tide back.
- ²⁰ Rain from 1 p. m. to 2 p. m.
- ²¹ Rain from 12.50 p. m. to 5 p. m.
- ²² Began raining at 7 p. m.

TABLE III.—Statement of shipments of shad fry made from Battery Station, Havre de Grace, Md., in April, May, and June, 1886.

State.	Place of deposit.	Stream.	Date.	Number sent.
Maryland.....	Near Battery Station ¹	Susquehanna River.....	Apr. 25	25,000
Do.....	do ¹	do.....	Apr. 26	1,421,000
Do.....	Below Port Deposit ¹	do.....	Apr. 27	2,431,000
Do.....	do.....	do.....	Apr. 27	(³)
Maryland.....	Near Battery Station ¹	Susquehanna River.....	Apr. 28	860,000
Do.....	do.....	Northeast, Gunpowder, and Bush Rivers. ⁴	Apr. 28	1,500,000
Do.....	Above Havre de Grace ¹	do.....	Apr. 29	1,055,000
Do.....	Near Battery Station ¹	do.....	Apr. 30	50,000
Do.....	do.....	Gunpowder, Northeast, and Patapsco Rivers. ⁴	Apr. 30	1,430,000
Do.....	do.....	Bush and Elk Rivers ⁴	May 1	1,200,000
Pennsylvania.....	Harrisburg ⁴	Susquehanna River.....	May 3	1,021,000
Maryland.....	Near Battery Station ¹	do.....	May 3	51,952,000
Rhode Island.....	Providence ⁴	Narragansett Bay.....	May 5	1,500,000
Maryland.....	Near Battery Station ¹	do.....	May 5	804,000
Do.....	Below Port Deposit ¹	do.....	May 6	1,245,000
Do.....	do.....	do.....	May 7	
Do.....	do.....	Chester River ⁶	May 8	500,000
Do.....	do.....	Patuxent River ⁶	May 9	650,000
Oregon.....	do.....	Columbia River. ⁷	May 9	1,000,000
Do.....	do.....	do ⁷	May 9	(⁸)
Maryland.....	do.....	Northeast River ⁶	May 10	500,000
South Carolina.....	Columbia ⁴	Broad and Saluda Rivers.....	May 10	1,500,000
Maryland.....	do.....	Gunpowder River ⁶	May 11	600,000
Do.....	do.....	Bush River ⁶	May 11	300,000
Do.....	do.....	Northeast River ⁶	May 11	1,500,000
Do.....	do.....	Northeast and Elk Rivers ⁶	May 12	600,000
Do.....	do.....	Northeast River and flats off Locust Point. ¹⁰	May 12	1,500,000
West Virginia.....	Grafton ¹¹	Monongahela River.....	May 12	250,000
Maryland.....	do.....	Brandywine and Nanticoke Rivers. ⁶	May 13	900,000
Do.....	Off Ordinary Point ⁹	Sassafras River.....	May 13	1,000,000
Georgia.....	do.....	Withlacoochee and Ocklockonee Rivers. ⁴	May 14	1,500,000
Virginia.....	Clifton Forge ¹¹	James River.....	May 14	250,000
New York.....	Near Oswego ⁶	Lake Ontario.....	May 14	(¹²)
Maryland.....	do.....	Chester River ³	May 14	600,000
Do.....	Below Port Deposit ¹	Susquehanna River.....	May 15	370,000
Delaware.....	do.....	Brandywine River ³	May 16	450,000
West Virginia.....	Rowlesburgh ¹¹	Cheat River.....	May 17	300,000
Maryland.....	Millington ⁶	Chester River.....	May 18	600,000
Delaware.....	Seaford ⁶	Nanticoke River.....	May 18	450,000
Maryland.....	Salisbury ⁶	Wicomico River.....	May 19	450,000
Do.....	do.....	Patuxent River ³	May 19	540,000
West Virginia.....	do.....	Monongahela River ¹¹	May 21	300,000
Pennsylvania.....	Near Columbia ⁶	Susquehanna River.....	May 24	895,000
Maryland.....	Above Port Deposit ⁶	do.....	May 25	750,000
Pennsylvania.....	Peach Bottom ⁶	do.....	May 20	836,000
Do.....	Marietta ⁴	do.....	May 26	1,500,000
Delaware.....	Seaford ⁷	Nanticoke River.....	May 27	977,000
Maryland.....	Conowingo ⁶	do.....	May 28	500,000
North Carolina.....	Fayetteville ⁴	Cape Fear River.....	May 29	1,100,000
West Virginia.....	Fairmont ¹¹	Monongahela River.....	May 30	200,000
Pennsylvania.....	Safe Harbor ⁶	Susquehanna River.....	May 31	550,000
Do.....	Tides Eddy ⁶	do.....	June 1	500,000
Maryland.....	Above Havre de Grace ³	do.....	June 2	100,000
Do.....	Below Havre de Grace ¹	do.....	June 5	228,000
Do.....	do ¹	do.....	June 7	429,000
Do.....	Near Battery Station ¹	do.....	June 9	472,000
Do.....	do ¹	do.....	June 10	298,000
Do.....	do ¹	do.....	June 12	481,000
Do.....	do ¹	do.....	June 13	250,000
Total.....				43,776,000

¹ By employees of station.² Fifty thousand eggs on trays shipped to H. C. Mercer, by steamship Elder, for Danube River.³ By R. H. Dana.⁴ By N. Simmons, car No. 1.⁵ Eggs almost hatched when put into river.⁶ By F. L. Donnelly.⁷ By J. F. Ellis, car No. 3.⁸ Delivered 585,000 eggs in good order.⁹ By steamer Lookout.¹⁰ By launches Nos. 68 and 82.¹¹ By H. E. Quinn.¹² Seventy-five thousand rockfish.