

## XXVII.—REPORT ON THE PROPAGATION OF SCHOODIC SALMON IN 1883-'84.

By CHARLES G. ATKINS.

The season opened with the promise of an average run of fish. The early spring fishing with hook and line had been very good. The late spring fishing (in June with fly) had been unusually poor, but this was in part attributable to the stage of the lake, which was high and rising all the season. Young salmon were quite plenty; those too small to take a fly were constantly jumping at it. October 27, the date of my arrival on the ground for the work of the spawning season, there appeared to be plenty of fish above the nets. They were often seen jumping, and had at that date already begun to dig the gravel.

The nets were put in position for fishing October 29, and during the following night 113 salmon came in. On the night of the 30th, 50 salmon were taken, and the two succeeding nights yielded 75 each. The males were at first, as usual, in excess, but the relative numbers of the sexes were reversed after the first two nights, and from that time to the close of the season the females were in excess every night. In ordinary seasons, when the aggregate numbers caught of the two sexes are equal, it is customary to infer that we are at the height of the run, and that about half the fish have already come in. This year this conjunction of affairs was reached at the early date of November 4, when only 427 salmon had been captured. I then conceived a hope that this might prove to be an exceptional season, when the females might exceed the males in a much greater ratio than usual. Such proved to be the case. Of the total catch of 1,005, there were 719 females (71 per cent.) and 295 males (29 per cent.). This is a greater disparity than has ever before occurred here.

The fish proved large and prolific. There were 661 gravid females, and they yielded 1,070,500 eggs, an average of 1,623 to each female. This is not quite equal to the yield of the previous season, which was 1,779, but is 98 in excess of that of 1881 (1,525 per fish).

The males averaged 3.2 pounds in weight; the largest one weighed 5.4 pounds, and the smallest (adult) 1.1 pounds. The heaviest female was one of 4.8 pounds, the lightest weighed 1.8 pounds, and the gravid ones averaged 3 pounds. Ovarian disease, which has been mentioned in previous reports as prevalent among the Schoodic salmon, was found

to affect 119 females out of 604 which were examined. This is a percentage of near 20. In 1882 the percentage affected was but 7; in 1881 it is recorded as 17, but I doubt whether the scrutiny of the workmen was as close that year as this. This disease was recognized by defects in the eggs, and may have extended no further. In most cases but a very few eggs were affected.

The eggs were divided between the two hatcheries, those intended for early shipment being placed in No. 3, which is fed by spring water, and the remainder in No. 2, which is fed by lake water. The aggregate losses from the regular pickings up to February 28 were 38,135, and 72,365 unfertilized were removed after concussion. The stock of good eggs was thus reduced to 960,000, of which 240,000 were set aside for the reserve, and 720,000 were available for division among the subscribers.

The following statement shows the details of the division:

Party.	Contribution.	Ratio.	Quota of eggs.
United States.....	\$1,400	$\frac{1}{4}$	373,000
Maine.....	500	$\frac{1}{4}$	133,500
Massachusetts.....	500	$\frac{1}{4}$	133,500
New Hampshire.....	300	$\frac{3}{4}$	80,000
	2,700		720,000

The share of the United States was allotted and forwarded as follows:

Party.	Allotment.	Where sent.
Michigan Commission.....	10,000	Paris, Mich.
Nebraska Commission.....	20,000	South Bend, Nebr.
A. R. Fuller, Meacham Lake, N. Y.....	2,000	Duane, N. Y.
H. H. Sneed, Chattanooga, Tenn.....	10,000	Wytheville, Va.
Vermont Commission.....	10,000	Plymouth, N. H.
Wisconsin Commission.....	10,000	Madison, Wis.
Sir James Gibson Maitland, Scotland.....	5,000	Stirling, Scotland.
New Hampshire Commission.....	40,000	Plymouth, N. H.
Dr. C. H. Barber, Rutland, Vt.....	5,000	Rutland, Vt.
United States Commission.....	45,000	Wytheville, Va.
Massachusetts Commission.....	40,000	Winchester, Mass.
Iowa Commission.....	10,000	Anamosa, Iowa.
Maryland Commission.....	5,000	Baltimore, Md.
Cold Spring Harbor Hatchery, New York.....	40,000	Cold Spring Harbor.
Thomas D. Sayles, Mechanicsville, Conn.....	10,000	Poquonock, Conn.
Maine Commission.....	50,000	Enfield and Weld, Me.
California Commission.....	30,000	Sacramento, Cal.
	342,000	

The number actually shipped to fill these allotments was 346,000. There remained 27,000 of the share falling to the United States Commission that were unassigned. These were retained at the station, hatched with the reserve, and turned into Grand Lake. Those belonging to the States were all transported. The transfer was accomplished in the usual manner between February 25 and March 26, and with entire success. Details will be given below in Table II. The only lot calling for special mention was that shipped to Sir James Maitland, Stirling, Scotland. These eggs were packed as usual for a few days'

journey in wet moss with a protective covering of dry moss, and sent to Mr. Mather in New York, with the expectation that he would unpack them and repack in another manner. They were, however, sent aboard the steamer Baltic without opening. They reached their destination and were unpacked fifteen days and twenty one hours from the time they were packed up at Grand Lake Stream, and, with the exception of bare twenty-five eggs, they were all in perfect condition.

The completion of the incubation of these eggs was generally attended with good success. The exceptions are those sent to Wytheville, Va., and Madison, Wis., and possibly the shipment to Iowa, from which nothing definite has been heard. The Wisconsin lot hatched successfully, but "on about the seventh day after hatching," writes Mr. Nevin, the superintendent, "a white speck began to form on the sack (and, as you know, that is a sure sign of death), and a week after they commenced to die there was not a live fish left in the trough." The death of all those sent to Wytheville also occurred after hatching.

The details of the planting of the young fish so far as they have been received will be found below, in Table III.

TABLE I.—Fishing record, Grand Lake Stream.

Date.	Nightly catch.				Summaries.				Temperature of water.	Height of Grand Lake.	
	Males.	Females.	Of doubtful sex.	Total.	Males.	Females.	Of doubtful sex.	Total.			
1883.										<i>Pt.</i>	<i>Ins.</i>
Oct. 29-30	80	33		113					47		
30-31	30	20		50					47	2	1½
Oct. 31-Nov. 1	31	44		75					46½		
Nov. 1-2	30	45		75	171	142		313	46½		
2-3	22	37		59	193	179		372	46		
3-4	17	38		55	210	217		427	45½		
4-5	14	62		76	224	279		503	45	2	1½
5-6	11	54		65	235	303		538	45½		
6-7	4	55		59	239	388		627	46½		
7-8	15	107		122	254	495		749	45		
8-9	6	50		56	260	545		805	44		
9-10	9	33		42	269	578		847	46	2	2
10-11	3	47		49	272	615		887	45		
11-12	7	27		34	279	662		941	45½		
12-13	5	26		31	284	688		972	41½		
13-14	5	11		16	289	690		978	38½		
14-15	3	13	1	17	292	712	1	995	37½		
15-16	1	3		4	293	715	1	999	36		
16-17	1	1		2	294	716	1	1001	35½		
18-19	1	2		3	295	718	1	1004	37½		
19-20	0	1		1	295	719	1	1005	37½	2	1½

TABLE II.—Statement of the transfer of Seboidic salmon from Grand Lake Stream in February and March, 1884.

Date of shipment.	Consignee.	Address.	Final destination.	Number of cases.	Weight.	Number of eggs.			Distance trans- ported.	Time en route.*	Condition on un- packing.	Dead on un- pack- ing.
						Belonging to States.	Belonging to United States.	Total				
1884.												
Feb. 25	U. S. Fish Commission	Washington, D. C.	Wytheville, Va.	1	117	42,000	42,000	11,150	389	94	Good	50
25	G. W. Delawder	Druid Hill Park, Baltimore	Baltimore, Md.	1	33	5,000	5,000	805	568	52	do	25
25	U. S. Fish Commission	Washington, D. C.	Washington, D. C.	1	33	5,000	5,000	848	360	70	do	30
25	H. J. Fenton	Windsor Conn.	Pouquock Conn.	1	48	10,500	10,500	389	1,925	121	do	20
26	F. Mather	Cold Spring Harbor, New York	Cold Spring Harbor and Bisby Lake, N. Y.	1	111	41,500	41,500	640	1,607	104	do	4
26	E. A. Brackett	Winchester, Mass	Winchester, Mass	1	159	52,000	52,000	389	1,431	123	do	10
26	E. B. Hodge	Plymouth, N. H.	Plymouth, N. H.	1	118	41,500	41,500	568	583	265	do	1
27	E. A. Brackett	Winchester, Mass	Winchester, Mass	1	85	33,000	33,000	360	1,425	122	do	25
28	Marin E. O'Brien	South Bend, Nebr.	South Bend, Nebr.	1	70	20,000	20,000	360	1,500	69	do	47
28	B. E. Shaw	Anamosa, Iowa	Anamosa, Iowa	1	47	10,000	10,000	369	505	52	do	28
28	Philo Drumming	Madison, Wis.	Madison, Wis.	1	49	10,000	10,000	1,536	360	70	do	30
28	W. D. Starks	Paris, Mich.	Paris, Mich.	1	48	10,000	10,000	1,431	360	70	do	4
Mar. 3	A. R. Fuller	Malone, N. Y.	Mencham Lake, New York	1	19	2,000	2,000	583	265	10	do	10
3	Dr. C. H. Barber	Rutland, Vt.	Rutland, Vt.	1	31	5,000	5,000	122	381	25	do	1
3	F. Mather	Care F. G. Blackford, Fulton Market, New York	Stirling, Scotland	1	32	5,000	5,000	12,800	381	25	do	25
3	U. S. Fish Commission	Washington, D. C.	Wytheville, Va.	1	46	10,000	10,000	1,150	369	69	do	47
3	E. A. Brackett	Winchester, Mass	Winchester, Mass	1	221	46,500	20,000	65,500	505	52	do	28
4	E. B. Hodge	Plymouth, N. H.	Plymouth, N. H.	1	198	38,500	30,000	68,500	505	52	do	28
4	F. C. Hewey	Rangely, Me.	Rangely, Me.	1	145	55,000	55,000	1300	262	262	do	50
5	David Masterman	Weld, Me.	Weld, Me.	1	141	55,000	55,000	1257	70	70	do	150
6	R. H. Buckingham	Sacramento, Cal	Sacramento, Cal	1	97	39,000	30,600	43,700	264	264	do	150
25	A. J. Darling	Enfield, Me.	Enfield, Me.	1	140	23,500	30,000	53,500	103	46	do	49
26	E. A. Brackett	Winchester, Mass	Winchester, Mass	1	67	20,000	20,000	389	71	71	do	13
26	D. Masterman	Weld, Me.	Weld, Me.	1	66	20,000	20,000	1257	72	72	do	21
26	E. B. Hodge	Plymouth, N. H.	Plymouth, N. H.	1	66	20,000	20,000	568	93	93	do	26
						347,000	346,000	693,000				

\* The figures in the table refer to the transfer to Cold Spring Harbor only; 31,000 of the eggs were repacked and sent to Bisby Lake with considerable loss.

\* The time is reckoned to the unpacking of the eggs.  
† Approximate.

TABLE III.—Statement of the planting of Schoolic salmon fry in 1884.

State.	Where hatched.	Waters stocked.	Tributary to—	Locality of deposit.	Date of deposit.	Number of fish.
California.	Sacramento.	Donner Lake		Nevada County	1884.	12,000
		Lake Bigler		do	May	14,000
Connecticut	Poquonock	Readsville Pond	Thames River	Thompson, Windham County	June	9,666
Maine	Endell	Nicotans Lake	Mattawakeg River	Island Falls, Aroostook County	Apr. 22	38,000
		Cold Stream Pond	Penobscot River	Enfield	June	15,000
	Rangely	Streams leading into Rangely, Moosehmagantic and Cnpsup-tic Lakes.	Androscoggin River	Franklin County, near Rangely	July	52,000
	Weld	Brooks tributary to Wilton Pond	Sandy and Kennebec Rivers	Wilton, Franklin County	June	5,000
	Grand Lake Stream	Brooks tributary to Weld Pond	Swift and Androscoggin Rivers	Weld, Franklin County	June	65,000
	Baltimore.	Grand Lake	Schoolic and Saint Croix Rivers	Hinkley, Washington County	June	261,704
Maryland.	Winchester	Returns deficient	Returns deficient	Garrett County	June	3,900
Massachusetts*		do	do	Returns deficient		Returns deficient.
Michigan	Paris	Torch Lake	Rapid River	Kalkaska, Kalkaska County	June 6	9,739
Nebraska	South Bend	Spring Brook	Running Water River	Fort Niobrara	Apr. 11	4,950
New Hampshire	Plymouth	Newfound Lake	Pemigewasset River	Hebron, Grafton County	June 7	10,000
		Squam Lake	do	Holderness, Grafton County	June 9	10,000
		Sinapsee Lake	Merrimac River	Newbury, Sullivan County	June 16	10,000
		Pleasant Pond	do	Deerfield	June 14	5,000
		Tarleton Lake	Connecticut River	Piermont	June 17	5,000
		Welsh Lake	Merrimac River	Franklin	June 19	5,000
		Pratt's Pond	do	New Ipswich	June 19	5,000
		Polcy Pond	do	Berry	June 19	5,000
		North Pond	do	Harrisville	June 20	5,000
		Humphrey's Pond	Connecticut River	Winchester	June 20	3,000
		Umberg Lake	Androscoggin River	Cambridge	June 23	10,000
		Dan & Holo Pond	Saco River	Tuftonboro	June 28	15,000
		Echo Lake	Connecticut Lake	Franconia	June 28	5,000
		Musshelic Lake	Merrimac River	Manchester	June 30	5,000
New York	Biaby Lake	Woodhull Lake	Black River	Wilmut, Herkimer County	May 20	10,000
Vermont.	Rutland	Spring Lake (= Shrewsbury Pond)	Otter Creek and Lake Champlain.	Shrewsbury, Rutland County	June 1	4,700
	Plymouth, N. H.	No returns				

\* From the Massachusetts commissioners I have received the following statement: "Distribution of Schoolic salmon from hatching-house, Winchester, Mass., for the great ponds throughout the State, delivered during the last of May and first of June, 1884, as follows: Thomas Lawrence, Falmouth, 6 cans; Hon. Charles G. Reed, Worcester, 7 cans; J. B. Hall, Stockbridge, 3 cans; H. R. Boyden, Sharon, 2 cans; C. E. Peck, Willsburgh, 2 cans; M. Gifford, Falmouth (Wiquoit), 4 cans; J. T. Hinds, Webster, 2 cans; E. S. Thayer, Siskim, 3 cans; W. A. Ballard, Natick, 6 cans; A. H. Manning, Pittsfield, 3 cans; E. Howes, Gloucester, 2 cans; S. P. Keyes, New Marlboro, 4 cans; J. O. Parker, Methuen, 2 cans; Spencer Water Company, Spencer, 2 cans; B. P. Chadwick, Bradford, 1 can; H. H. Wyman, Winchendon, 4 cans; C. E. Gould, Lecomister, 2 cans; Moses Palmer, Groton, 1 can. The remainder, together with the 30,000 (really 40,000) donated by the U. S. Commission, were put into Myatic Pond, in Winchester and Alford.