Catalogue of the collection to illustrate the animal resources and the fisheries of the United States, exhibited at Philadelphia in 1876 by the Smithsonian Institution and the United States Fish Commission, and forming a part of the United States National Museum

Washington, Govt. Print. Off, 1879
https://www.biodiversitylibrary.org/bibliography/15755

no.14 (1879): https://www.biodiversitylibrary.org/item/53225

Article/Chapter Title: Protection and Culture
Author(s): Goode, G. Brown
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SECTION E.

PROTECTION AND CULTURE.

I. INVESTIGATION.

1. METHODS OF THE UNITED STATES FISH COMMISSION.

Methods of work.

Apparatus for collecting specimens. (See under B.)

Apparatus for physical research.

Appliances for working up results.

This should include a model of coast laboratory with all its fittings.

Photographs.[1]

401. Headquarters of the United States Fish Commission, Wood's Holl, Mass.

400. Little Harbor of Wood's Holl, Mass., with headquarters of U. S. Fish Commission.

399. Harbor of Wood's Hole, Mass., from the wharf of the Fish Commission laboratory.

398. Harbor of Wood's Holl, Mass., with U. S. Fish Commission fleet for 1871.

397. Village of Wood's Holl, Mass., with the Pacific Soluble Guano Company's Works.

404. Yacht "Mazeppa," employed in the service of the U. S. Fish Commission.

403. U. S. steamer "Blue Light" at the wharf of the U. S. Fish Commission, Wood's Holl, Mass.

402. Village of Wood's Holl, Mass., showing laboratory of U. S. Fish Commission.

Results of work.

1. Reports of the Commission.

(UNITED STATES COMMISSION OF FISH AND FISHERIES. PART I.—REPORT ON THE CONDITION OF THE SEA-FISHERIES OF THE SOUTH COAST OF NEW ENGLAND IN 1871 AND 1872. By Spencer F. Baird, Commissioner. With supplementary papers. Washington: Government Printing-Office. 1873. 8vo, xlvii, 852 pp., 40 pl., with 38 explanatory (to pl. 1–38). 1 folded map.)

I. REPORT OF THE COMMISSIONER (S. F. Baird). pp. vii–xlvii.[2]

II. GENERAL PLAN OF INQUIRIES PROSECUTED. (1. MEMORANDA OF INQUIRY RELATIVE TO THE FOOD-FISHES OF THE UNITED STATES. 2. QUESTIONS RELATIVE TO THE FOOD-FISHES OF THE UNITED STATES.) pp. 1–6.

[1] The photographs here enumerated were on exhibition. Many others are in the possession of the Commission.

[2] This portion, with general title-page (pp. i–xlvii), was issued in advance separately.

Results of work.

1. Reports of the Commission.

(UNITED STATES COMMISSION OF FISH AND FISHERIES. PART I.)

III. TESTIMONY IN REGARD TO THE PRESENT CONDITION OF THE FISHERIES, TAKEN IN 1871. pp. 7–72.

IV. SPECIAL ARGUMENTS IN REGARD TO REGULATING THE SEA-FISHERIES BY LAW. pp. 73–103.

V. REPORTS OF STATE COMMISSIONS IN REGARD TO REGULATING THE SEA-FISHERIES. pp. 104–124.

VI. REPORT OF CONFERENCE OF THE UNITED STATES COMMISSIONER WITH THE COMMISSIONERS OF RHODE ISLAND AND MASSACHUSETTS, held October 5, 1871. pp. 125–131.

VII. DRAUGHT OF LAW PROPOSED FOR THE CONSIDERATION OF, AND ENACTMENT BY, THE LEGISLATURES OF MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT. pp. 132–134.

VIII. MISCELLANEOUS CORRESPONDENCE AND COMMUNICATIONS ON THE SUBJECT OF THE SEA-FISHERIES. pp. 134–138.

IX. EUROPEAN AUTHORITIES ON THE SUBJECT OF REGULATING THE FISHERIES BY LAW. pp. 139–148.

X. NOTICES IN REGARD TO THE ABUNDANCE OF FISH ON THE NEW ENGLAND COAST IN FORMER TIMES. pp. 149–172.

XI. STATISTICS OF FISH AND FISHERIES ON THE SOUTH SHORE OF NEW ENGLAND. pp. 173–181.

XII. SUPPLEMENTARY TESTIMONY AND INFORMATION RELATIVE TO THE CONDITION OF THE FISHERIES OF THE SOUTH SIDE OF NEW ENGLAND, TAKEN IN 1872. pp. 182–195.

XIII. PLEADINGS BEFORE THE SENATE COMMITTEE ON FISHERIES OF THE RHODE ISLAND LEGISLATURE, AT ITS JANUARY SESSION OF 1872. pp. 196–227.

XIV. NATURAL HISTORY OF SOME OF THE MORE IMPORTANT FOOD-FISHES OF THE SOUTH SHORE OF NEW ENGLAND, (viz: the Scup (*Stenotomus argyrops*), and the Blue-fish (*Pomatomus saltatrix*). pp. 228–252.

XV. DESCRIPTION OF APPARATUS USED IN CAPTURING FISH ON THE SEA-COAST AND LAKES OF THE UNITED STATES. pp. 253–274, with 19 (1–19) figs., and pl. (maps) xxxix and xl, and large folded map.

XVI. LIST OF PATENTS GRANTED BY THE UNITED STATES TO THE END OF 1872 FOR INVENTIONS CONNECTED WITH THE CAPTURE, UTILIZATION, OR CULTIVATION OF FISH AND MARINE ANIMALS. pp. 275–280.

XVII. LIST OF THE SEA-WEEDS OR MARINE ALGÆ OF THE SOUTH COAST OF NEW ENGLAND. By W. G. Farlow, M. D. pp. 281–294.

XVIII. REPORT UPON THE INVERTEBRATE ANIMALS OF VINEYARD SOUND AND THE ADJACENT WATERS, WITH AN ACCOUNT OF THE PHYSICAL CHARACTER OF THE REGION. By A. E. Verrill. pp. 295–778, with pl. i–xxxviii.

Results of work.

1. Reports of the Commission.

(UNITED STATES COMMISSION OF FISH AND FISHERIES. PART I.)

XIX. CATALOGUE OF THE FISHES OF THE EAST COAST OF NORTH AMERICA. By Theodore Gill. pp. 779–822.

XX. LIST OF FISHES COLLECTED AT WOOD'S HOLL (between June 20 and October 4). By S. F. Baird. pp. 823–827.

XXI. TABLE OF TEMPERATURES OF THE LITTLE HARBOR, WOOD'S HOLL, MASS., FROM JANUARY 1, 1873, TO DECEMBER 31, 1873. pp. 828–831.

XXII. LIST OF ILLUSTRATIONS. p. 833.

XXIII. GENERAL INDEX. pp. 835–852.

UNITED STATES COMMISSION OF FISH AND FISHERIES. PART II.—REPORT OF THE COMMISSIONER FOR 1872 AND 1873. A.—INQUIRY INTO THE DECREASE OF FOOD-FISHES. B.—THE PROPAGATION OF FOOD-FISHES IN THE WATERS OF THE UNITED STATES. By Spencer F. Baird, Commissioner. With supplementary papers. Washington: Government Printing-Office. 1874.

REPORT OF THE COMMISSIONER. (Table of contents precedes report.)

APPENDIX A.—THE FISHERIES OF THE GREAT LAKES AND THE SPECIES OF COREGONUS OR WHITEFISH.

I. REPORTS ON THE FISHERIES OF THE GREAT LAKES; THE RESULT OF INQUIRIES PROSECUTED IN 1871 AND 1872. By James W. Milner. (Table of contents on p. 77.)

II. MISCELLANEOUS NOTES AND CORRESPONDENCE RELATIVE TO THE WHITEFISH. pp. 79–88.

APPENDIX B.—THE SALMON AND THE TROUT (species of the *Salmo*). p. 89.

III. ON THE NORTH AMERICAN SPECIES OF SALMON AND TROUT. By George Suckley, Surgeon United States Army (written in 1861). p. 91. Tabulated list of species, pp. 92–159.

IV. THE SALMON OF THE DANUBE, OR THE HUCHO (*Salmo hucho*), AND ITS INTRODUCTION INTO AMERICAN WATERS. By Rudolph Hessel. p. 161.

V. IMPROVEMENT IN THE SALMON-FISHERIES OF SWEDEN. (Extract from the report of the Royal Swedish Intendant of Fisheries, 1868.) p. 166.

VI. REPORT OF OPERATIONS DURING 1872 AT THE UNITED STATES HATCHING ESTABLISHMENT ON MCCLOUD RIVER, AND ON THE CALIFORNIA SALMONIDÆ GENERALLY, WITH A LIST OF SPECIMENS COLLECTED. By Livingston Stone.

A. Introductory remarks. pp. 168–174.

B. The Salmonidæ of the Sacramento River. pp. 175–197.

C. Catalogue of natural-history specimens collected on the Pacific slope in 1872, by Livingston Stone, for the United States Fish Commission.

VII. NOTES ON THE SALMON OF THE MIRAMICHI RIVER. By Livingston Stone; p. 216. Fragmentary notes. p. 217.

VIII. THE SALMONIDÆ OF EASTERN MAINE, NEW BRUNSWICK, AND NOVA SCOTIA. By Charles Lanman. pp. 219–225.

IX. ON THE SALMON OF EASTERN NORTH AMERICA, AND ITS ARTIFICIAL CULTURE. By Charles G. Atkins. (Table of contents on p. 336.) p. 226.

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(UNITED STATES COMMISSION OF FISH AND FISHERIES. PART II.)

X. ON THE SALMON OF MAINE. By A. C. Hamlin. pp. 338–356.

XI. THE LAKE TROUTS. By A. Leith Adams, M. A., &c. p. 357.

XII. ON THE SPECKLED TROUT OF UTAH LAKE. By Dr. H. C. Yarrow, U. S. A., Surgeon and Naturalist, &c. pp. 358–363.

XIII. MISCELLANEOUS NOTES AND CORRESPONDENCE RELATIVE TO SALMON AND TROUT. pp. 364–378.

XIV. ADDITIONAL REPORTS RELATIVE TO THE HATCHING AND PLANTING OF THE PENOBSCOT SALMON. p. 380.

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B. New Jersey. p. 381.

C. Pennsylvania. p. 382.

D. Ohio. p. 382.

E. Wisconsin. p. 383.

APPENDIX C.—THE SHAD AND ALEWIFE (species of *Clupeidæ*). p. 385.

XV. LETTERS REFERRING TO EXPERIMENTS OF W. C. DANIELL, M. D., IN INTRODUCING SHAD INTO THE ALABAMA RIVER. pp. 386, 387.

XVI. LETTERS REFERRING TO SHAD IN THE RIVERS TRIBUTARY TO THE GULF OF MEXICO. pp. 388–391.

XVII. REPORT OF A RECONNAISSANCE OF THE SHAD-RIVERS SOUTH OF THE POTOMAC. By H. C. Yarrow, M. D. pp. 396–401.

XVIII. REPORT ON SHAD-HATCHING OPERATIONS. pp. 403–417.

XIX. REPORT ON THE PROPAGATION OF THE SHAD (*Alosa Sapidissma*), AND ITS INTRODUCTION INTO NEW WATERS BY THE UNITED STATES COMMISSIONER, IN 1873. By James W. Milner. pp. 419–450.

XX. NOTES ON THE NATURAL HISTORY OF THE SHAD AND ALEWIFE. pp. 452–462.

APPENDIX D.—FISH CULTURE (THE HISTORY, THEORY, AND PRACTICE OF FISH-CULTURE). pp. 463, 464.

XXI. THE HISTORY OF FISH-CULTURE. p. 465.

A. The history of fish-culture in Europe, from its earlier record to 1854. By Jules Haime. pp. 465–492.

B. Report on the progress of pisciculture in Russia. By Theodore Soudakèvicz. pp. 493–512.

C. Report on the state of pisciculture in France and the neighboring countries. By M. Bouchon-Brandley, assistant secretary of the College of France. pp. 513–522.

D. The progress of fish-culture in the United States. By James W. Milner. pp. 523–558.

E. Alphabetical list of American fish-culturists and of persons known as being interested in fish-culture. pp. 558–566.

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1. Reports of the Commission.

(UNITED STATES COMMISSION OF FISH AND FISHERIES. PART II.)

XXII. PAPERS RELATING TO PRACTICAL FISH-CULTURE.

A. Method of treating adhesive eggs of certain fishes, especially of the Cyprinidæ, in artificial propagation. By Rudolph Hessel. pp. 567–570.

B. On the so-called "dry" method of impregnating spawn. By Alexander Stenzel, inspector of fisheries in Silesia, Germany. pp. 571–574.

C. Fish-culture in salt or brackish waters. By Theodore Lyman, Fish Commissioner of Massachusetts. pp. 575–577.

D. Descriptions of improved apparatus in fish-hatching. pp. 578–587.

APPENDIX E.—OBSTRUCTIONS TO THE UPWARD MOVEMENT OF FISHES IN STREAMS, AND THE REMEDY. pp. 588, 589.

XXIII. ON FISH-WAYS. By Charles G. Atkins. pp. 591–615.

XXIV. ON OBSTRUCTIONS TO THE ASCENT OF FISH IN CERTAIN RIVERS. p. 617.

A. Obstructions in the rivers of Maine. By E. M. Stillwell. pp. 617–621.

B. Obstructions in the tributaries of Lake Champlain. By M. C. Edmunds. pp. 622–627.

C. Obstructions in some of the rivers of Virginia. By M. McKennie. pp. 628–629.

D. Character of the streams on the northern shore of Lake Michigan. By J. F. Ingalls. pp. 630–632.

E. Characters of some of the northern tributaries of Lake Michigan. By James W. Milner. pp. 632–634.

APPENDIX F.—NATURAL HISTORY. pp. 635–636.

XXV. THE CRUSTACEA OF THE FRESH WATERS OF THE UNITED STATES. By Sidney I. Smith.

A. Synopsis of the higher fresh-water Crustacea of the Northern United States. pp. 637–657.

B. The crustacean parasites of the fresh-water fishes of the United States. pp. 661–665.

XXVI. SYNOPSIS OF THE NORTH AMERICAN FRESH-WATER LEECHES. By A. E. Verrill. pp. 666–689.

XXVII. SKETCH OP THE INVERTEBRATE FAUNA OF LAKE SUPERIOR. By Sidney I. Smith. pp. 690–706.

XXVIII. FOOD OF FRESH-WATER FISHES. By Sidney I. Smith. pp. 708–709.

XXIX. NATURAL AND ECONOMICAL HISTORY OF THE GOURAMI (Osphromenus goramy). By Theodore Gill. p. 710.

A. Natural history. pp. 710–717.

B. The introduction and attempts to introduce the gourami into foreign countries. pp. 718–726.

C. Rules for transportation and introduction. p. 727.

XXX. NOTES ON THE GRAYLING (*Thymallus*) OF NORTH AMERICA. By James W. Milner. pp. 729–742

APPENDIX G.—MISCELLANEOUS PAPERS. p. 743.

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XXXI. TEMPERATURE IN THE GULF OF MEXICO, FROM RECORDS OF THE UNITED STATES COAST SURVEY. pp. 745–748.

XXXII. CORRESPONDENCE WITH COMPANIES RELATIVE TO FACILITIES IN TRANSPORTATION, ETC. pp. 749–756.

XXXIII. REPORTS OF SPECIAL CONFERENCES WITH AMERICAN FISH-CULTURISTS' ASSOCIATION AND STATE COMMISSIONERS OF FISHERIES. p. 757.

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B. Meeting at New York, October 17, 1872. pp. 763–773.

XXXIV. BIBLIOGRAPHY OF REPORTS OF FISHERY COMMISSIONS. By Theodore Gill. pp. 764–773.

A. Names of Commissioners. p. 774.

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APPENDIX A.—SEA-FISHERIES AND THE FISHES AND INVERTEBRATES USED AS FOOD.

I. HISTORICAL OBSERVATIONS ON THE CONDITION OF THE FISHERIES AMONG THE ANCIENT GREEKS AND ROMANS AND THEIR MODE OF SALTING AND PACKING FISH. By J. K. Smidlo. pp. 1, 2.

II. STATISTICS OF THE MOST IMPORTANT FISHERIES OF THE NORTH ATLANTIC. By Carl Dambeck. pp. 3–24.

III. ON THE FISHERIES OF NORWAY. pp. 24–30.

IV. STATISTICAL DATA REGARDING THE SWEDISH FISHERIES. pp. 31–34.

V. ACCOUNT OF THE FISHERIES AND SEAL-HUNTING IN THE WHITE SEA, THE ARCTIC OCEAN, AND THE CASPIAN SEA. By Alexander Schultz. pp. 35, 96.

VI. THE NORWEGIAN HERRING-FISHERIES. By A. J. Breck and A. Fadderdin. pp. 97–122.

VII. PRELIMINARY REPORT FOR 1873–'74 ON THE HERRING AND THE HERRING-FISHERIES ON THE WEST COAST OF SWEDEN. By Axel Vilhelm Springman. pp. 123–168.

VIII. THE HALIBUT FISHERIES OF THE UNITED STATES. By Lieut. P. De Broca. pp. 169–172.

IX. THE FISHING VILLAGES SNIKKERSTUN AND SKOLTERUP, AND THE COLLECTION OF FISHING IMPLEMENTS EXHIBITED BY THEM AT ELSINORE, DENMARK, DURING THE SUMMER OF 1872. pp. 173–182.

X. ON THE HERRING AND ITS PREPARATION AS AN ARTICLE OF TRADE. By Hyalmar Widigner. pp. 183–192.

XI. NEW CONTRIBUTIONS TO THE HERRING QUESTION—THE DISPUTE BETWEEN AXEL BŒCK AND OSSIAN SARS REGARDING THE NORWEGIAN SUMMER HERRING—SARS' RECENT OBSERVATIONS AND HIS NEW THEORY ON THE MIGRATION OF THE HERRING. pp. 193–194.

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XIII. THE NORWEGIAN LOBSTER FISHERY AND ITS HISTORY. By Axel Broeck. pp. 223–252.

XIV. TRANSPORTATION OF LOBSTERS TO CALIFORNIA. pp. 253–257.

XV. ON THE ARTIFICIAL PROPAGATION OF THE LOBSTER. pp. 258–266.

XVI. ON THE OYSTER INDUSTRIES OF THE UNITED STATES. By Lieut. P. De Broca. pp. 267–320.

APPENDIX B.—THE RIVER FISHERIES. pp. 321–322.

XVII. THE PROPAGATION AND DISTRIBUTION OF THE SHAD. pp. 323–350.

XVIII. REPORT OF THE TRIANA TRIP. By J. W. Milner. pp. 351–362.

XIX. ON THE TRANSPORTATION OF SHAD FOR LONG DISTANCES. pp. 363–371.

XX. REPORT OF OPERATIONS IN CALIFORNIA IN 1873. By Livingston Stone. pp. 372–427.

XXI. HATCHING AND DISTRIBUTION OF CALIFORNIA SALMON. pp. 428–436.

XXII. REPORT OF OPERATIONS DURING 1874 AT THE UNITED STATES SALMON-HATCHING ESTABLISHMENT ON THE MCCLOUD RIVER, CALIFORNIA. By Livingston Stone. pp. 437–476.

XXIII. CORRESPONDENCE RELATING TO THE SAN JOAQUIN RIVER AND ITS FISHES. pp. 477–484.

XXIV. THE ATLANTIC SALMON (*Salmo Salar*). By A. G. Atkins. pp. 485–539.

APPENDIX C.—FISH-CULTURE, RELATING MORE ESPECIALLY TO SPECIES OF (*Cyprinidæ*). pp. 540.

XXV. NOTES ON PISCICULTURE IN KIANG SI. By H. Kopsch. pp. 543–548.

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XXVII. THE GOLD ORFE (*Cyprinus orfus*). pp. 559–562.

XXVIII. DIRECTIONS FOR USING TABLES FOR RECORDING THE PROPAGATION AND DISTRIBUTION OF FISH. pp. 563–568.

APPENDIX D.—THE RESTORATION OF THE INLAND FISHERIES. pp. 569–570.

XXIX. FISHERIES AND FISHING LAWS IN AUSTRIA AND THE WORLD IN GENERAL. By Carl Peyrer. pp. 571–680.

XXX. HOW CAN OUR LAKES AND PONDS BE STOCKED WITH FISH IN THE SHORTEST POSSIBLE TIME? By Mr. Von dem Borne. pp. 681-684.

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XXXI. PRELIMINARY REPORT ON A SERIES OF DREDGINGS MADE ON THE UNITED STATES COAST SURVEY STEAMER BACHE IN THE GULF OF MAINE. By A. S. Packard, jr., M. D. pp. 687–690.

XXXII. LIST OF THE MARINE ALGÆ OF THE UNITED STATES. By W. G. Farlow. pp. 691–718.

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1. Reports of the Commission.

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XXXIII. SECTION ON THE ORGANS OF REPRODUCTION AND THE FECUNDATION OF FISHES AND ESPECIALLY OF EELS. By Dr. Syvski. pp. 719–734.

XXXIV. THE FOOD AND MODE OF LIVING OF THE SALMON, THE TROUT, AND THE SHAD. By D. Barfurth. pp. 735–758.

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I. REPORT OF THE COMMISSIONER.

A.—GENERAL CONSIDERATIONS.

1. INTRODUCTORY REMARKS. p. 1.

B.—INQUIRY INTO THE DECREASE OF FOOD-FISHES.

2. INVESTIGATIONS AND OPERATIONS OF 1875. p. 4.

3. INVESTIGATIONS AND OPERATIONS OF 1876. p. 7.

C.—THE PROPAGATION OF FOOD-FISHES.

4. GENERAL CONSIDERATIONS. p. 8.

5. ACTUAL WORK OF PROPAGATION OF FOOD-FISHES IN 1875 AND 1876. p. 20.

The shad. p. 20.

The California salmon. p. 21.

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APPENDIX A.—THE SEA FISHERIES.

I. HISTORY OF THE AMERICAN WHALE FISHERY FROM ITS EARLIEST INCEPTION TO THE YEAR 1876. By Alexander Starbuck.

APPENDIX B.—THE INLAND FISHERIES.

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III. THE SALMON FISHERIES OF THE COLUMBIA RIVER. By Livingston Stone. p. 801.

IV. NOTES ON SOME FISHERIES OF THE DELAWARE RIVER. By Dr. C. C. Abbott. p. 825.

V. METHOD OF PURIFYING THE RESIDUUM OF GAS-WORKS BEFORE ALLOWING IT TO PASS OFF INTO THE WATER. By J. R. Shotwell. p. 847.

VI. TABLES OF TEMPERATURES OF AIR AND WATER AT SUNDRY STATIONS OF THE UNITED STATES SIGNAL OFFICE, FROM MARCH, 1874, TO FEBRUARY, 1875, AND FROM MARCH, 1876, TO FEBRUARY, 1877, INCLUSIVE. p. 851.

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APPENDIX C.—THE PROPAGATION OF FOOD-FISHES.

VII. THE CARP AND ITS CULTURE IN RIVERS AND LAKES, AND ITS INTRODUCTION INTO AMERICA. By Rudolph Hessel. p. 865.

VIII. THE PROPAGATION AND DISTRIBUTION OF SHAD. Jas. W. Milner. p. 901.

IX. ON THE COLLECTION OF EGGS OF SCHOODIC SALMON IN 1875 AND 1876. By Charles G. Atkins. p. 910.

X. OPERATIONS ON THE MCCLOUD RIVER IN SALMON-BREEDING IN 1875. By Livingston Stone. p. 921.

XI. OPERATIONS ON THE MCCLOUD RIVER IN SALMON-BREEDING IN 1876. By Livingston Stone. p. 935.

XII. CORRESPONDENCE RELATING TO THE EXPORTATION OF FISH-HATCHING APPARATUS TO NEW ZEALAND, GERMANY, &C. p. 959.

ALPHABETICAL INDEX. p. 1025.

2. COLLECTIONS. (See under A, V to VIII.)

Photographs.

See series of photographs and color-sketches of North American fishes.

Upwards of four hundred casts of coast and fresh-water species.

(See under A, V to VIII.)

II. PROTECTION.

2. PRESERVATION OF GAME, FISH, ETC.

* *From man.*

Game laws.

** *From artificial obstructions.*

Fish-ways.

Gap fish-ways.
French, ditch, or "Cape Cod" fish-ways.
Oblique groove fish-ways.
Single groove.

15355. Model of fish-way. James D. Brewer, inventor, Muncy, Lycoming County, Pa.

15356. Model of fish-way. James D. Brewer, Muncy, Pa.

Fish-ways.

Step fish-ways.

Box or pool fish-ways.

26108. Model of fish-way. Jas. D. Brewer, Muncy, Pa. Patented by Daniel Steck.

Steps contrived by arrangement of rocks and bowlders.

25701. Model of Duncanson fish way. J. T. Rothe.

Inclined plane without steps.

29283. Model of old Pennsylvania fish-way. Built at Columbia, on the Susquehanna River, in 1866. Designed by James Worral. Scale, $\frac{1}{8}$ inch to the foot. C. G. Atkins, Bucksport, Me.

29284. Model of old Pennsylvania fish-way. Built at Columbia, on the Susquehanna River, in 1873. Designed by James Worral. Scale, $\frac{1}{8}$ inch to the foot. C. G. Atkins, Bucksport, Me.

With partitions at right angles.

29291. Model of rectangular return fish-way. Scale, $\frac{1}{4}$ inch to the foot. C. G. Atkins, Bucksport, Me.

Brackett's patent fish-way.

29285. Brackett's patent fish-way. Scale, $\frac{1}{4}$ inch to the foot. C. G. Atkins, Bucksport, Me.

26937. Model of the fish-way at Holyoke, Mass., on the Connecticut River. Scale, $\frac{1}{8}$ of an inch to the foot ($\frac{1}{96}$). C. G. Atkins.

This fish-way is on the Brackett plan. A submerged piece of cob-work surmounted by a grating serves to turn the fish into the fish-way. It carries a column of water 2 feet wide and 2 feet deep which reaches the bottom with no perceptible increase in velocity, the current being less than 2 miles an hour. Height of the dam, 30 feet; length of the fish-way, 440 feet; the incline, 1 in 15.

With oblique partitions.

29287. An adaptation of Foster's fish-way. Designed by C. G. Atkins, and built at Pembroke, Me. Scale, $\frac{1}{4}$ inch to the foot. C. G. Atkins, Bucksport, Me.

29286. Model of Foster's fish-way. Invented by H. H. Foster, E. Machias, Me. Scale, $\frac{1}{4}$ inch to the foot. C. G. Atkins, Bucksport, Me.

29288. Model of oblique fish-way. Invented by Alfred Swazey, Bucksport, Me., in 1876. Scale, $\frac{1}{4}$ inch to the foot. C. G. Atkins, Bucksport, Me.

29289. Swazey's oblique fish-way. Invented by Alfred Swazey, Bucksport, Me., in 1874. Scale, $\frac{1}{4}$ inch to the foot. C. G. Atkins, Bucksport, Me.

29290. Model of Swazey & Atkins's fish-way. Invented by Alfred Swazey and C. G. Atkins, Bucksport, Me., in 1874. Scale, $\frac{1}{4}$ inch to the foot. C. G. Atkins, Bucksport, Me.

——. Model of the McDonald fish-way. M. McDonald, Lexington, Va.

26939. No. 15. Model of the fish-way at Lawrence, Mass., on the Merrimack River. Scale, $\frac{1}{8}$ inch to the foot ($\frac{1}{96}$). C. G. Atkins.

Fish-ways.

With rectangular compartments.

26937. Model of rectangular compartment fish-way on the inclined-plane system, in an extended arrangement. Scale, ½ inch to the foot ($\frac{1}{24}$). C. G. Atkins.

Spiral fish-ways.

26949. No. 11. Model of rectangular compartment fish-way on the inclined-plane system, in spiral arrangement, devised by Charles G. Atkins, of Bucksport, Me., in imitation of Pike's spiral fish-way. Scale, ½ inch to the foot ($\frac{1}{24}$). C. G. Atkins.

This model represents a fish-way precisely the same capacity and slope, and adapted to a dam of the same height as No. 10, showing the great economy of space and material effected by the spiral arrangement. Further advantages of the spiral arrangement are the facility with which water can be admitted at different heights of the river, and contiguity of the outlet to the dam secured, so that the fish will readily find it.

26931. Model of Pike's spiral fish-way, devised by Hon. R. G. Pike, of Connecticut. Sale, ½ inch to the foot ($\frac{1}{24}$). C. G. Atkins.

The advantages of this, the first spiral arrangement invented in America, are the same as those claimed for that arrangement in Pike's spiral fish-way.

Moving float fish-ways.

26930. Model of Everleth's fish-way, devised by F. M. Everleth, M. D., of Waldorboro', Me. Scale, ¼ inch to the foot ($\frac{1}{48}$). C. G. Atkins.

The peculiarity of this fish-way is the movable attachment at the upper end, which, by its own buoyancy, rises and falls with the fluctuations of the river, thus insuring that the entrance shall always be at the right height to admit the requisite quantity of water.

****From natural enemies.*

Apparatus for destroying injurious species.

Oyster-bed tangles. (See under B, 12.)

Tethers and hopples.

Cages and pens.

Kennels for dogs, &c.
Cages for animals.
Cages for birds.
Cages for insects.

5631. Cages for fire-flies. West Indies. Miss Septimia Randolph.

Fish-cars and other floating cages for aquatic animals.

29539. Model of fish-marketman's car. For preservation of living fish. J. M. K. Southwick, Newport, R. I.

22221. Model of Providence River fish-car. These are towed by the smack, and as fast as fish are caught they are put into it, and so kept for Providence market. D. D. Almy.

29397. Model of Noank lobster-car. Capt. H. C. Chester.

29538. Model of fisherman's car for transporting living fish to market. J. M. K. Southwick, Newport, R. I.

26933. Model of a boat used in transporting living salmon at the United States salmon-breeding station at Bucksport, Me. Scale, 1 inch to the foot ($\frac{1}{12}$). C. G. Atkins.

When in use the boat is depressed until full of water, a number of salmon, sometimes as many as 30, are placed in it, and it is then towed after another boat, the motion insuring a constant change of water, which passes in at the forward ports and out at the after ports. The net and grating prevent the escape of the salmon, and the cloth shuts out the sight of anything that might frighten them.

Aquaria.

Globes.

Aquaria.

Hives and other cages for insects.

Live-boxes, troughs, &c., for microscopists' use.

Fish-ponds, fish-farms (models).

29278. Parlor trout-brook. Stone & Hooper, Charlestown, N. H.

29380. Rearing-box. Stone & Hooper, Charlestown, N. H.

4. Enemies of useful animals.

Intestinal worms and other internal parasites.[1]

Fish-lice, barnacles, and other external parasites.[1]

Predatory animals not elsewhere exhibited.

III. PROPAGATION.

5. Propagation of mammals.

Methods of mink culture.

Methods of culture of domesticated animals.

6. Propagation of birds.

Methods of ostrich culture.

Methods of culture of domesticated birds, fowls, &c.

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[1] See in Part II of the present catalogue.

7. PROPAGATION OF REPTILES.

Methods of terrapin culture.

8. PROPAGATION OF AMPHIBIANS.

Methods of frog culture.

9. PROPAGATION AND CULTURE OF FISHES.[1]

Accessories of obtaining and impregnating ova.

Pans, pails, &c.
Strait-jackets used in spawning salmon.
Spawning-race (Ainsworth).
Roller spawning-screen (Collins).
Spawning-vat (Bond).

Hatching-apparatus.

26940. No. 19. Model of hatching-house at United States salmon-breeding station at Bucksport, Me. Scale, $\frac{1}{4}$ inch to the foot ($\frac{1}{48}$). C. G. Atkins.

The hatching-troughs are arranged in sets of four across the building, and fitted with Brackett trays. The water enters them from a feed-trough along the side of the room and escapes by pipes through the floor.

Troughs:
Plain.
Gravel-bottomed.
With sieve-bottom trays.

26933. No. 20. Model of hatching-troughs and trays in use at the United States salmon-breeding stations at Bucksport and Grand Lake Stream, Me. Scale, full size. C. G. Atkins.

The eggs to be hatched are placed on the wire-cloth trays.

26935. Model of hatching-frame in use at Grand Lake Stream, adapted to use in a trough or in an open stream. Devised by C. G. Atkins. Scale, full size. C. G. Atkins.

The eggs are placed on all of the trays except the upper one. The interstices, though too small for the escape of the eggs, permit a change of water, and when the frame is shut it confines the trays securely in place.

26970. Model of hatching-apparatus for black-bass. John Roth, Duncannon, Pa.

Brackett's.
Williamson's.
Clark's.
Vats or cases:
Holton's.
Roth's.

[1] Many of these articles cannot conveniently be exhibited.

Hatching-apparatus.

Glass-grilled boxes (Coste's).

26995. Coste hatching-tray. Mrs. J. H. Slack, Troutdale, N. Y.

Jars and tin vessels.

22247. Shad-hatching can. Invention of Fred. Mather. U. S. Fish Commission.
26909. Ferguson aquarium-jar. T. B. Ferguson, Baltimore, Md.
22250. Ferguson's fish-hatching can. " "
26998. Ferguson's hatching jar. " "

Hatching-boxes (floating).

26903. Shad-hatching box. Seth Green's patent. U. S. Fish Commission.
26997. Shad-hatching box. Seth Green's patent. Seth Green, Rochester, N. Y.
26904. Shad-hatching box. Brackett's patent. U. S. Fish Commission.
26962. Shad-hatching box. Brackett's patent. E. A. Brackett, Winchester, Mass.
26905. Shad-hatching box (No. 2). Brackett's patent. U. S. Fish Commission.
26906. Shad-hatching box. Bryant's patent. U. S. Fish Commission.
26907. Shad-hatching box. Stillwell & Atkins's patent. U. S. Fish Commission.
26908. Shad-hatching box. Bannister's design. U. S. Fish Commission.
26955. Hatching apparatus. N. W. Clark, Clarkston, Mich.
——. Shad hatching-box (model). J. C. House & O. A. McClain, Washington, D. C.

Adhesive eggs apparatus:

Vertical wire-cloth trays.

Hatching-basket.

26956. Salmon egg hatching-baskets. McCloud River, California. Livingston Stone.

Brook-shanty (Furman's).

(Bay or cove barriers, Professor Rasch's.)

Accessories:

Tanks.

Nests.

Trays.

Grilles.

Gravel-filters.

Flannel screens.

Shallow troughs or tables (for picking eggs).

Egg-nippers.

26915. Wooden nippers. Fred. Mather, Honeoye Falls, N. Y.
25955. Brass egg-nippers. Frank N. Clark, Northville, Mich.

Cribbles.

Pipettes.

Skimmer-nets.

Hatching-apparatus.

Accessories:

Feathering quills and brushes.
Rose-nozzles (for washing eggs).
Syringes, bulb, &c.
Shallow pans.
Aerating-pipe.

Transporting apparatus.

Apparatus for transporting eggs:

Cans.
Case of cups (Wilmot's).
Case of cups (Clark's).
Case of trays (Clark's).
Moss-crates (Stone's).

25025. Moss-crates for transportation of eggs of Sacramento salmon across the continent. Livingston Stone, Charlestown, N. H.

Apparatus for transporting fish:

Barrels.
Cans, plain.

26911. Milk-can, used in transportation. U. S. Fish Commission.
29377. Conical tank. Stone & Hooper, Charlestown, N. H.
26910. Conical can. Livingston Stone, Charlestown, N. H.

Cans with aerating accessories:

26914. Tank for ocean transportation. Invention of Fred. Mather. U. S. Fish Commission.
29379. Transporting-tank. Stone & Hooper, Charlestown, N. H.
26881. Transporting-can. C. W. Rogers, Waukegan, Ill.
26932. Model of box used in the transportation of living salmon at the United States salmon-breeding station at Bucksport, Me. Scale, 2 inches to the foot ($\frac{1}{6}$). C. G. Atkins.
When in use the box is filled with water and from 5 to 7 salmon placed in it and carted a mile.

Slack's.
Clark's.
M. A. Green's.
Tanks, with attachment of band-wheel to car-axle (Stone's).
(Tanks, with Freiburg aerating apparatus.)
Aquarium-car (Stone's).
Live-box (Atkins's).
Accessories:

Air force-pumps.
Siphon-tubes.

26912. Rubber siphon-tube. U. S. Fish Commission.
26913. Aerating-rose, with siphon. U. S. Fish Commission.

Transporting apparatus.

Accessories:

Bellows.
Dipping apparatus.

26934. Model of dipping-bag used instead of a dip-net in handling salmon at the United States salmon-breeding station at Bucksport, Me. Scale, 1 inch to the foot ($\frac{1}{12}$). C. G. Atkins.

10. PROPAGATION OF INSECTS.

Propagation of silk-worm.

Specimens of plants used for food.
Model of house and its appliances.

Propagation of cochineal insect.
Propagation of bees.

For hives see under E, 3.

11. PROPAGATION OF WORMS.

Propagation of leeches.

12. PROPAGATION OF MOLLUSKS.

Methods of oyster culture.

Stools for receiving spat, natural and artificial.
Other apparatus.

13. PROPAGATION OF CORALS.

14. PROPAGATION OF SPONGES.

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I. INVESTIGATION.

1. METHODS OF THE UNITED STATES FISH COMMISSION.
Miethods of work.

Apparatus for collecting specimens. (See under B.)
Apparatus for physical research.
Appliances for working up results.

This should include a model of coast laboratory with all its fittings.
Photographs.!

401. Headquarters of the United States Fish Commission, Wood's Holl, Mass.

400. Little Harbor of Wood's Holl, Mass., with headquarters of U.S. Fish Commission.

399. Harbor of Wood's Hole, Mass., from the wharf of the Fish Commis-

~ sion laboratory.
* 398. Harbor of Wood's Hoil, Mass., with U. S. Fish Commission fleet for

1871.

397. Village of Wood's Holl, Mass., with the Pacific Soluble Guano Company's Works.

404, Yacht ''Mazeppa," employed in the service of the U. 8. Fish Commission.

403. U.S. steamer 'Blue Light" at the wharf of the U. 8S. Fish Commission, Wood's Holl, Mass. '

402. Village of Wood's Holl, Mass., showing laboratory of U. S. Fish Commission.

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(UNITED STATES COMMISSION OF FISH AND FISHERIES. Part I.—REPORT ON THE CONDITION OF THE SEA-FISHERIES OF THE SOUTH COAST OF New ENGLAND IN 1871 AND 1872. By Spencer F. Baird, Commissioner. With supplementary papers. Washington: Government Printing-Office. 1873. 8vo, xlvii, 852 pp., 40 pl., with 38 explanatory (to pl. 1-38). 1 folded map.)

I. REPORT OF THE COMMISSIONER (S. F. Baird). pp. vii-

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'The photographs here enumerated were on exhibition. Many others are in the possession of the Commission.
2This portion, with general title-page (pp. i-xlvii), was issued in advance separately.
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V. METHOD OF PURIFYING THE RESIDUUM OF GAS-WORKS BEFORE ALLOWING IT TO PASS OFF INTO THE WATER. By J. R. Shotwell. p. 847.
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APPENDIX C.—THE PROPAGATION OF FOOD-FISHES.
VII. THE CARP AND ITS CULTURE IN RIVERS AND LAKES, AND ITS INTRODUCTION INTO AMERICA. By Rudolph Hessel. p. 865.
VIII. THE PROPAGATION AND DISTRIBUTION OF SHAD. Jas. W. Milner. p. 901.
IX. ON THE COLLECTION OF EGGS OF SCHOODIC SALMON IN 1875 anD 1876. By Charles G. Atkins. p.910.
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XI. OPERATIONS ON THE McCLouD RIVER IN SALMON-BREEDING IN 1876. By Livingston Stone. p. 935.
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ALPHABETICAL INDEX. p. 1025.

2. COLLECTIONS. (See under A, V to VIII.)

Photographs.

: See series of photographs and color-sketches of North American fishes.
Upwards of four hundred casts of coast and fresh-water species.
(See under A, V to VIII.)

II. PROTECTION.

2. PRESERVATION OF GAME, FISH, ETC.

From man.

Game laws.
xx From artificial obstructions.

Fish-ways.

, Gap fish-ways.
French, ditch, or “Cape Cod” fish-ways.
Oblique groove fish-ways.
Single groove.

15355. Model of fish-way. James D. Brewer, inventor, Muncy, Lycoming County, Pa.
15356. Model of fish-way. James D. Brewer, Muncy, Pa.

[Begin Page: Page 242]

Fish-ways.

Step fish-ways.
Box or pool fish-ways.

26108. Model of fish-way. Jas. D. Brewer, Muncy, Pa. Patented by Daniel Steck.

Steps contrived by arrangement of rocks and bowlders.
25701. Model of Duncanson fish way. J. T. Rothe.

Inclined plane without steps.

29283. Model of old Pennsylvania fish-way. Built at Columbia, on the Susquehanna River, in 1866. Designed by James Worral. Scale, 4 inch to the foot. C. G. Atkins, Bucksport, Me.

29284. Model of old Pennsylvania fish-way. Built at Columbia, on the Susquehanna River, in 1873. Designed by James Worral. Scale, 4 inch to the foot. C. G. Atkins, Bucksport, Me.

With partitions at right angles.

29291. Model of rectangular return fish-way. Scale, + inch to the foot. C. G. Atkins, Bucksport, Me.

Brackett's patent fish-way.

29285. Brackett's patent fish-way. Scale, + inch to the foot. C. G. Atkins, Bucksport, Me.

26937. Model of the fish-way at Holvoke, Mass., on the Connecticut River. Scale, 4 of an inch to the foot (3). C. G. Atkins.

This fish-way is on the Brackett plan. A submerged piece of cobwork surmounted by a grating serves to turn the fish into the fish-way. It carries a column of water 2 feet wide and 2 feet deep which reaches the bottom with no perceptible increase in velocity, the current being less than 2 milesan hour. Height of the dam, 30 feet; length of the fish-way, 440 feet; the incline, 1 in 15.

With oblique partitions.

29287. An adaptation of Foster's fish-way. Designed by C. G. Atkins, and built at Pembroke, Me. Scale, inch to the foot. C. G. Atkins, Bucksport, Me.

29286. Model of Foster's fish-way. Invented by H. H. Foster, E. Machias, Me. Seale, 4 inch to the foot. C. G. Atkins, Bucksport, Me.

29288. Model of oblique fish-way. Invented by Alfred Swazey, Bucksport, Me., in 1876. Scale, + inch to the foot. C. G. Atkins, Bueksport, Me.

29289. Swazey's oblique fish-way. Invented by Alfred Swazey, Bucksport, Me.,in 1874. Scale, + inch to the foot. C. G. Atkins, Bucksport, Me.

29290. Model of Swazey & Atkins's fish-way. Invented by Alfred Swazey and C. G. Atkins, Bucksport, Me., in 1874. Scale, } inch to the foot. C. G. Atkins, Bucksport, Me.

—. Model of the McDonald fish-way. M. McDonald, Lexington, Va.

26939. No. 15. Model of the fish-way at Lawrence, Mass., on the Merrimack River. Scale, 4 inch to the foot (¢;). C. G. Atkins.

[Begin Page: Page 243]

Fish-ways.
With rectangular compartments.

26937. Model of rectangular compartment fish-way on the inclined-plane system, in an extended arrangement. Scale, 4 inch to the foot (c4). C. G. Atkins,

Spiral fish-ways.

26949, No. 11. Model of rectangular compartment fish-way on the inclined-plane system, in spiral arrangement, devised by Charles G. Atkins, of Bucksport, Me., in imitation of Pike's spiral fish-way. Scale, + inch to the foot (34). C. G. Atkins.
This model represents a fish-way precisely the same capacity and slope, and adapted to a dam of the same height as No. 10, showing the great economy of space and material effected by the spiral arrangement. Further advantages of the spiral arrangement are the facility with which water can be admitted at different heights of the river, and contiguity of the outlet to the dam secured, so that the fish will readily find it.
26931. Model of Pike's spiral fish-way, devised by Hon. R. G. Pike, of Connecticut. Sale, $ inch to the foot (4,). C. G. Atkins.
The advantages of this, the first spiral arrangement invented in America, are the same as those claimed for that arrangement in Pike's spiral fish-way.

Moving float fish-ways.

26930, Model of Everleth's fish-way, devised by F. M. Everleth, M. D., of ' Waldorboro', Me. Scale, + inch to the foot (44). C. G. Atkins.

The peculiarity of this fish-way is the movable attachment at the upper end, which, by its own buoyancy, rises and falls with the fluctuations of the river, thus insuring that the entrance shall always be at the right height to admit the requisite quantity of water. :

xxx rom natural enemies.

Apparatus for destroying imjurious species.
Oyster-bed tangles. (See under B, 12.)

Tethers and hopples.
Cages and pens.

Kennels for dogs, &e.
Cages for animals.
Cages for birds.
Cages for insects.

5631. Cages for fire-flies. West Indies. « Miss Septimia Randolph,

[Begin Page: Page 244]

Fish-cars and other floating cages for aquatic ani-)

mais.

29539. Model of fish-marketman's car, For preservation of living fish. J. M. K. Southwick, Newport, R. I. :

22221. Model of Providence River fish-car. These are towed by the smack, and as fast as fish are caught they are put into it, and so kept for Providence market. D. D. Almy.

29397. Model of Noank lobster-car. Capt. H. C. Chester.

29538. Model of fisherman's car for transporting living fish to market. J. M. K. Southwick, Newport, R. I.

26933. Model of a boat used in transporting living salmon at the United States salmon-breeding station at Bucksport, Me. Scale, 1 inch to the foot (72). C. G. Atkins.

When in use the boat is depressed until full of water, a number of salmon, sometimes as many as 30, are placed in it, and it is then towed after another boat, the motion insuring a constant change of water, which passes in at the forward ports and out at the after ports. The net and grating prevent the escape of the salmon, and the cloth shuts out the sight of anything that might frighten them.

Aquaria.

Globes.

Aquaria.

Hives and other cages for insects.
Live-boxes, troughs, &c., for microscopists' use.
Fish-ponds, fish-farmes (models).

29278. Parlor trout-brook. Stone & Hooper, Charlestown, N.H.
29380. Rearing-box. Stone & Hooper, Charlestown, N. H.

4, ENEMIES OF USEFUL ANIMALS.

Intestinal worms and other internal parasites.'
Fish-lice, barmacies, and other extermal parasites.'
Predatory animals mot elsewhere exhibited.

III. PROPAGATION.

5. PROPAGATION OF MAMMALS.

Methods of mink culture.
Methods of culture of domesticated animals.

6. PROPAGATION OF BIRDS.

Methods of ostrich culture.
Methods of culture of domesticated birds, fowls, &c.

1See in Part II of the present catalogue.

[Begin Page: Page 245]

7. PROPAGATION OF REPTILES.

Methods of terrapin culture.

8. PROPAGATION OF AMPHIBIANS.

Methods of frog culture. —

9. PROPAGATION AND CULTURE OF FISHES.!

Accessories of obtaining and impregnating ova.

Pans, pails, &c.

Strait-jackets used in spawning salmon.
Spawning-race (Ainsworth).

Roller spawning-screen (Collins).
Spawning-vat (Bond).

Hatching-apparatus.

26940. No. 19. Model of hatching-house at United States salmon-breeding station at Bucksport, Me. Scale, }inch to the foot (4). C. G. Atkins.

The hatching-troughs are arranged in sets of four across the building, and fitted with Brackett trays. The water enters them from a feed-trough along the side of the room and escapes by pipes through the floor.

Troughs:
Plain.
Gravel-bottomed.
With sieve-bottom trays.

26935. No. 20. Model of hatching-troughs and trays in use at the United States salmon-breeding stations at Bucksport and Grand Lake Stream, Me. Scale, full size. C.G. Atkins.
The eggs to be hatched are placed on the wire-cloth trays.
26935. Model of hatching-frame in use at Grand Lake Stream, adapted to use in a trough or in an open stream. Devised by C. G. Atkins. Scale, full size. C. G. Atkins.
The eggs are placed on all of the trays except the upper one. The interstices, though too small for the escape of the eggs, permit a change of water, and when the frame is shut it confines the trays securely in place.
26970. Model of hatching-apparatus for black-bass. John Roth, Duncannon, Pa.

Brackett's.
Williamson's.
Clark's.

' Vats or cases:
Holton's.

Roth's.

1 Many of these articles cannot conveniently be exhibited.

[Begin Page: Page 246]

Hatching-apparatus.

Glass-grilled boxes (Coste's).

26995. Coste hatching-tray.

Jars and tin vessels.

22250
26998

. Shad-hatching can.

Hatching-boxes (floating).

26203.
26997.

26904,
20962.

25905.

25906.
26907.

26908.

Shad-hatching box.
Shad-hatching box.

INI:

Shad-hatching box.
Shad-hatching box.

Mass.

Shad-hatching box (No. 2).

mission.

Shad-hatehing box.
Shad-hatching box.

mission.

Shad-hatching box.
26955. Hatching apparatus.
. Shad hatching-box (model).

ton, D.C.

Mrs. J. H. Slack, Troutdale, N. Y.

Invention of Fred. Mather. U.S. Fish Com-

mission.
9, Fereuson aquarium-jar. T. B. Ferguson, Baltimore, Md.
s i : $ ’ ’
. Ferguson’s fish-hatching can. “ s
. Ferguson’s hatching jar. ee o

U.S. Fish Commission. -
Seth Green, Rochester,

Seth Green's patent.
Seth Green's patent.

Brackett's patent. U.S. Fish Commission.
Brackett's patent. E. A. Brackett, Winchester,
Brackett#'s patent. U. 8. Fish Com-

Bryant's patent. U.S. Fish Commission.
Stillwell & Atkins's patent. U.S. Fish Com-

Bannister's design. U. 8. Fish Commission.
N. W. Clark, Clarkston, Mich.
J.C. House & O. A. McClain, Washing-

Adhesive eggs apparatus:
Vertieal wire-cloth trays.
Hatching-basket.

26956. Salnon egg hatching-baskets. McCloud River, California. Living-

ston Stone.

Brook-shanty (Iurman's).
(Bay or cove barriers, Professor Rasch's.)
Accessories :
Tanks.
Nests.
Trays.
Grilles.
Gravel-filters.
Flannel screens.
Shallow troughs or tables (for picking eggs).
Egeg-nippers.

26015,

Wooden nippers.

25955. Brass egg-nippers.

Cribbles.
Pipettes.
Skimmer-nets.

Fred. Mather, Honeoye Ialls, N. Y.
Frank N. Clark, Northville, Mich.

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Hatchimg-apparatus.

Accessories:

Feathering quills and brushes.
Rose-nozzles (for washing eggs).
Syringes, bulb, &c.

Shallow pans.

Aerating-pipe.

Transporting apparatus.

Apparatus for transporting eggs:

Cans.

Case of cups (Wilmot's).
Case of cups (Clark's).
Case of trays (Clark's).
Moss-crates (Stone's).

25025. Moss-crates for transportation of eggs of Sacramento salmon across the continent. Livingston Stone, Charlestown, N. H.

Apparatus for transporting fish:

Barrels.
Cans, plain.

26911. Milk-can, used in transportation. U.S. Fish Commission,
29377. Conical tank. Stone & Hooper, Charlestown, N. H.
26910. Conical can. Livingston Stone, Charlestown, N. H.

Cans with aerating accessories:

26914. Tank for ocean transportation. Invention of Fred. Mather. U.S. Fish Commission,

29379. Transporting-tank. Stone & Hooper, Charlestown, N. H.

26881. Transporting-can. C. W. Rogers, Waukegan, III.

26932. Model of box used in the transportation of living salmon at the

United States salmon-breeding station at Bucksport, Me. Scale, 2 inches to the foot (}). C. G. Atkins.
When in use the box is filled with water and from 5 to 7 salmon placed in it and carted a mile.

Slack's.
Clark's.
M. A. Green's.

Tanks, with attachment of band-wheel to car-axle (Stone's).
(Tanks, with Freiburg aerating apparatus.)

Aquarium-car (Stone's)-

Live-box (Atkins's).

Accessories:

Air force-pumps.
Siphon-tubes.

26912. Rubber siphon-tube. U.S. Fish Commission.
26913. Aerating-rose, with siphon. U.S. Fish Commission.

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Transporting apparatus. 4
Accessories :

Bellows.
Dipping apparatus.
26934. Model of dipping-bag used instead of a dip-net in handling salmon at the United States salmon-breeding station at Bucksport, Me.
Scale, 1 inch to the foot (;,). C. G. Atkins.
10. PROPAGATION OF INSECTS.
Propagation of silk-worm.

Specimens of plants used for food.
Model of house and its appliances.

Propagation of cochineal insect.
Propagation of bees.

For hives see under E, 3.
11. PROPAGATION OF WORMS.
Propagation of leeches.
12. PROPAGATION OF MOLLUSKS.
Methods of oyster culture.

Stools for receiving spat, natural and artificial.
Other apparatus.

13. PROPAGATION OF CORALS.
14. PROPAGATION OF SPONGES.