

U. S. COMMISSION OF FISH AND FISHERIES,

JOHN J. BRICE, Commissioner.

PUBLICATIONS

OF THE

UNITED STATES COMMISSION OF FISH AND FISHERIES AVAILABLE FOR DISTRIBUTION ON JUNE 30, 1897.

Extracted from U. S. Fish Commission Report for 1896. Appendix 7, Pages 343 to 356.

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ON JUNE 30, 1897.

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PAMPHLET PUBLICATIONS.

Each pamphlet has a serial number, which appears on the left in the accompanying list. The missing numbers are out of print and can not be supplied.

Serial
No.

3. Report on the condition of the sea fisheries of the south coast of New England in 1871 and 1872, by Spencer F. Baird. Report for 1871-72, I, pp. I-XII, 1893.
4. Report of the Commissioner for 1872 and 1873.—A. Inquiry into the decrease of the food-fishes.—B. The propagation of food-fishes in the waters of the United States, by Spencer F. Baird. Report for 1872-73, II, pp. I-III. 1874.
15. Report of the Commissioner for 1873-74 and 1874-75.—A. Inquiry into the decrease of the food-fishes.—B. The propagation of food-fishes in the waters of the United States, by Spencer F. Baird. Report for 1873-74 and 1874-75, III, pp. VII-LI. 1876.
17. Report of the Commissioner for 1875-76.—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. Report for 1875-76, IV, pp. 1*-50*. 1878.
21. Cheap fixtures for hatching of salmon, by Charles G. Atkins. Report for 1878, VI, pp. 945-966 (including 15 figs.). 1880.
25. Report of the Commissioner for 1877.—A. Inquiry into the decrease of food-fishes.—B. Propagation of food-fishes in the waters of the United States, by Spencer F. Baird. Report for 1877, V, pp. 1*-48*. 1879.
27. The carp and its culture in rivers and lakes, and its introduction into America, by Rudolph Hessel. Report for 1875-76, IV, pp. 865-900 (including 6 figs.). 1878.
28. Report of the Commissioner for 1878.—A. Inquiry into the decrease of food-fishes. B. Propagation of food-fishes in the waters of the United States, by Spencer F. Baird. Report for 1878, VI, pp. XV-LXIV. 1880.
31. The winter haddock fishery of New England, by G. Brown Goode and J. W. Collins. Bulletin for 1881, I, pp. 226-235. 1882.
32. Report on the marine Isopoda of New England and adjacent waters, by Oscar Harger. Report for 1878, VI, pp. 297-462, plates I-XIII. 1880.
37. Gill nets in the cod fishery; a description of the Norwegian cod nets, with directions for their use, and a history of their introduction into the United States, by J. W. Collins. Bulletin for 1881, I, pp. 1-17, plates I-XII. 1881.
40. Popular extracts from the investigation of the Commission for the scientific examination of the German Seas, by H. A. Meyer et al. Report for 1879, VII, pp. 525-557 (including 17 figs.). 1882.
41. List of dredging stations of the U. S. Fish Commission from 1871 to 1879, inclusive, with temperature and other observations, by Sanderson Smith and Richard Rathbun. Report for 1879, VII, pp. 559-601. 1882.
42. Report on the cephalopods of the northeastern coast of America, by A. E. Verrill. Report for 1879, VII, pp. 211-455, plates I-XLVI. 1882.
46. Report of the Commissioner for 1879.—A. Inquiry into the decrease of the food-fishes.—B. The propagation of food-fishes in the waters of the United States, by Spencer F. Baird. Report for 1879, VII, pp. XI-LI. 1882.
51. Materials for the history of the swordfishes, by G. Brown Goode. Report for 1880, VIII, pp. 287-294, plates I-XXIV. 1883.
60. The Spanish mackerel, *Cybium maculatum* (Mitch.) Ag.; its natural history and artificial propagation, with an account of the origin and development of the fishery, by R. E. Earll. Report for 1880, VIII, pp. 395-426, plates I-III. 1883.
62. Report of the Commissioner for 1880.—A. Inquiry into the decrease of food-fishes.—B. Propagation of food-fishes in the waters of the United States, by Spencer F. Baird. Report for 1880, VIII, pp. XVII-XLVI. 1893.
65. Report of the Commissioner for 1881, by Spencer F. Baird. Report for 1881, IX, pp. XIII-LXXI. 1881.
68. The Annelida *Chaetopoda* from Provincetown and Wellfleet, Mass., by H. E. Webster and James E. Benedict. Report for 1881, IX, pp. 639-747, plates I-VIII. 1884.
70. Report on the construction and work in 1880 of the Fish Commission steamer *Fish Hawk*, by Z. L. Tanner. Report for 1881, IX, pp. 3-53, plates I-XVIII (including 3 figs.). 1884.
71. A contribution to the embryography of osseous fishes, with special reference to the development of the cod (*Gadus morhua*), by John A. Ryder. Report for 1882, X, pp. 455-605 (including 11 figs.), plates I-XII. 1881.
73. Annual report on the electric lighting of the U. S. F. C. steamer *Albatross*, December 31, 1883, by G. W. Baird. Bulletin for 1884, IV, pp. 153-158 (including 8 figs.). 1884.
75. The status of the U. S. Fish Commission in 1884, by G. Brown Goode. Report for 1884, XII, pp. 1139-1184. 1886.
77. Report of the Commissioner for 1882, by Spencer F. Baird. Report for 1882, X, pp. XVII-XCII. 1884.
89. Suggestions to the keepers of the United States life-saving stations, light-houses and light-ships, and to other observers, relative to the best means of collecting and preserving specimens of whales and porpoises, by Frederick W. True. Report for 1883, XI, pp. 1157-1182 (including 5 figs.), plates I-XI. 1885.

- Serial
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90. The osteology of *Amia calva*, including certain special refernces to the skele-ton of teleosteans, by R. W. Shufeldt. Report for 1883, xi, pp. 747-878, plates I-XIV. 1885.
 92. The first decade of the U. S. Fish Commission; its plan of work and accom-plished results, scientific and economical, by G. Brown Goode. Report for 1880, viii, pp. 53-62, 1883; also in Bulletin for 1882, ii, pp. 169-178. 1883.
 94. A catalogue of the fishes known to inhabit the waters of North America north of the Tropic of Cancer, with notes on the species discovered in 1883 and 1884, by David S. Jordan. Report for 1885, xiii, pp. 789-973. 1887.
 95. Report of the Commissioner for 1883, by Spencer F. Baird. Report for 1883, xi, pp. xvii-xcv. 1885.
 96. Report on the work of the U. S. Fish Commission steamer *Albatross* for the year ending December 31, 1883, by Z. L. Tanner. Report for 1883, xi, pp. 117-236, plates I-III. 1885.
 100. List of deep-water mollusca dredged by the U. S. Fish Commission steamer *Fish Hawk* in 1880, 1881, 1882, with their range in depth, by Katharine J. Bush. Report for 1883, xi, pp. 701-727. 1885.
 103. Utilizing water by fish-culture, by Berthold Bencke. Report for 1883, xi, pp. 1101-1131, plates I-V. 1885.
 104. An exposition of the principles of a rational system of oyster culture, together with an account of a new and practical method of obtaining oyster spat on a scale of commercial importance, by John A. Ryder. Report for 1885, xiii, pp. 381-423, plates I-IV. 1887.
 106. On the development of osseous fishes, including marine and fresh-water forms, by John A. Ryder. Report for 1885, xiii, pp. 489-604 (including 7 figs.), plates I-XXX. 1887.
 108. Report of the Commissioner for 1884, by Spencer F. Baird. Report for 1884, xii, pp. xiii-LXXI. 1886.
 110. Report on the work of the U. S. Fish Commission steamer *Albatross* for the year ending December 31, 1884, by Z. L. Tanner. Report for 1884, xii, pp. 3-116, plates I-III. 1886.
 111. Pond culture, by Carl Nicklas. Report for 1884, xii, pp. 467-655 (including 44 figs.). 1886.
 113. Report on the medusae collected by the U. S. Fish Commission steamer *Alba-tross* in the region of the Gulf Stream, 1883-84, by J. Walter Fewkes. Report for 1884, xii, pp. 927-980, plates I-X. 1886.
 114. On the origin of heterocercy and the evolution of the fins and fin rays of fishes, by John A. Ryder. Report for 1884, xii, pp. 981-1107 (including 8 figs.), plates I-XI. 1886.
 115. Report of the Commissioner for 1885, by Spencer F. Baird. Report for 1885, xiii, pp. xix-cxii. 1887.
 120. On the development of the cetacea, together with a consideration of the proba-ble homologies of the flukes of cetaceans and sirenians, by John A. Ryder. Report for 1885, xiii, pp. 427-488 (including 3 figs.), plates I-III. 1887.
 124. List of the dredging stations of the U. S. Fish Commission, the U. S. Coast Survey, and the British steamer *Challenger*, in North American waters, from 1867 to 1887, together with those of the principal European government expedi-tions in the Atlantic and Arctic oceans, by Sanderson Smith. Report for 1886, xiv, pp. 871-1017, 6 charts, 3 diagrams. 1889.
 127. A review of the *Scientia* of America and Europe, by David S. Jordan and Carl H. Eigenmann. Report for 1886, xiv, pp. 343-451, plates I-IV. 1889.
 129. Report on the medusae collected by the U. S. Fish Commission steamer *Albatross* in the region of the Gulf Stream in 1885-86, by J. Walter Fewkes. Report for 1886, xiv, pp. 513-536, plate I. 1889.
 130. Report on the work of the U. S. Fish Commission steamer *Albatross* for the year ending December 31, 1886, by Z. L. Tanner. Report for 1886, xiv, pp. 605-692, plates I-X. 1889.
 131. Report of operations at the Wytheville Station, Va., from January 1, 1885, to June 30, 1887, by Marshall McDonald. Report for 1886, xiv, pp. 793-800, plates I-VI. 1889.
 132. The beam-trawl fishery of Great Britain, with notes on beam-trawling in other European countries, by J. W. Collins. Bulletin for 1887, vii, pp. 289-407 (including 34 figs.), plates I-XXIII. 1889.
 134. Report of the Commissioner for 1886, by Spencer F. Baird. Report for 1886, xiv, pp. ix-lvii. 1889.
 137. Suggestions for the employment of improved types of vessels in the market fisheries, with notes on British fishing steamers, by J. W. Collins. Bulletin for 1888, viii, pp. 175-192, plates XVI-XXVII. 1890.

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138. Notes on the fishes collected at Cozumel, Yucatan, by the U. S. Fish Commission, with descriptions of new species, by Tarleton H. Bean. Bulletin for 1888, VIII, pp. 193-206, plates XXVIII-XXIX. 1890.
139. The most recent method of hatching fish eggs, by William F. Page. Bulletin for 1888, VIII, pp. 207-218 (including 4 figs.), plates XXX-XXXVI. 1890.
140. Review of the fisheries of the Great Lakes in 1885, with introduction and a description of fishing vessels and boats by J. W. Collins; by Hugh M. Smith and Merwin-Marie Snell. Report for 1887, XV, pp. 3-333, plates I-XIV. 1891.
141. A report upon the fishes of Kalamazoo, Calhoun, and Antrim counties, Mich., by Charles H. Bollman. Bulletin for 1888, VIII, pp. 219-225. 1891.
142. Notes on the fishes from the lowlands of Georgia, with a description of a new species (*Opaopcodus bollmani*), by Charles H. Gilbert. Bulletin for 1888, VIII, pp. 225-229. 1891.
143. The sturgeon and sturgeon industries of the eastern coast of the United States, with an account of experiments bearing upon sturgeon culture, by John A. Ryder. Bulletin for 1888, VIII, pp. 231-328, plates XXXVII-LIX. 1891.
144. A review of the genera and species of the *Serranide* found in the waters of America and Europe, by David S. Jordan and Carl H. Eigenmann. Bulletin for 1888, VIII, pp. 329-441, plates LX-LXIX. 1891.
145. Report on the proposed introduction of the Jamaica mountain mullet into the United States, by Tarleton H. Bean. Bulletin for 1888, VIII, pp. 443-451. 1891.
146. The transplanting of lobsters to the Pacific coast of the United States, by Richard Rathbun. Bulletin for 1888, VIII, pp. 453-472, plate LXXI. 1891.
147. Preliminary report on the invertebrate animals inhabiting Lakes Geneva and Mendota, Wisconsin, with an account of the fish epidemic in Lake Mendota in 1884, by S. A. Forbes. Bulletin for 1888, VIII, pp. 473-487, 1890, plates LXXII-LXXIV.
149. A reconnaissance of the streams and lakes of the Yellowstone National Park, Wyoming, in the interest of the U. S. Fish Commission, by David S. Jordan. Bulletin for 1889, IX, pp. 41-63, plates VI-XXII. 1891.
150. On two species of larval dibothria from the Yellowstone National Park, by Edwin Linton. Bulletin for 1889, IX, pp. 65-79, plates XXIII-XXVII. 1891.
151. The artificial propagation of sturgeon in Schleswig-Holstein, Germany. Bulletin for 1889, IX, pp. 81-90. 1891.
152. Report upon the pearl fishery of the Gulf of California, by Charles H. Townsend. Bulletin for 1889, IX, pp. 91-94, plates XXVIII-XXX. 1891.
154. On certain wart-like excrescences occurring on the short minnow (*Cyprinodon variegatus*) due to psorosperms, by Edwin Linton. Bulletin for 1889, IX, pp. 99-102, plate XXXV. 1891.
161. The fishing-grounds of Bristol Bay, Alaska. A preliminary report upon the investigations of the U. S. Fish Commission steamer *Albatross*, by Z. L. Tanner. Bulletin for 1889, IX, pp. 279-288, plates CVIII-CX. 1891.
162. Report upon an investigation of the fishing-grounds off the west coast of Florida, by A. C. Adams and W. C. Kendall. Bulletin for 1889, IX, pp. 289-312 (including 2 figs.), plate CXI. 1891.
163. The giant-scallop fishery of Maine, by Hugh M. Smith. Bulletin for 1889, IX, pp. 313-335, plates CXII-CXVI. 1891.
164. A contribution to the life history of *Dibothrium cordiceps* Leidy, a parasite infesting the trout of Yellowstone Lake, by Edwin Linton. Bulletin for 1889, IX, pp. 337-358, plates CXVII-CXIX. 1891.
165. Notice of the occurrence of protozoan parasites (psorosperms) on cyprinoid fishes in Ohio, by Edwin Linton. Bulletin for 1889, IX, pp. 359-361, plate CXX. 1891.
166. Notes on the king-crab fishery of Delaware Bay, by Hugh M. Smith. Bulletin for 1889, IX, pp. 363-370, plates CXXI-CXXIII. 1891.
167. Report upon a collection of fishes made in southern Florida during 1889, by James A. Henshall. Bulletin for 1889, IX, pp. 371-389. 1891.
168. Report upon a physical investigation of the waters of the southern coast of New England, made during the summer of 1889 by the U. S. Fish Commission schooner *Grampus*, by William Libbey, jr. Bulletin for 1889, IX, pp. 391-459 (including 1 fig.), plates CXXIV-CLVIII. 1891.
169. Notes on the oyster fishery of Connecticut, by J. W. Collins. Bulletin for 1889, IX, pp. 461-497, plates CLIX-CLXVI. 1891.
171. Report upon the construction and equipment of the schooner *Grampus*, by J. W. Collins. Report for 1887, XV, pp. 437-490 (including 5 figs.), plates I-XVIII. 1891.
172. Report of the operations of the U. S. Fish Commission schooner *Grampus* from March 15, 1887, to June 30, 1888, by J. W. Collins and D. E. Collins. Report for 1887, XV, pp. 491-508, plates I-XVI. 1891.
173. A review of the labroid fishes of America and Europe, by David S. Jordan. Report for 1887, XV, pp. 599-699, plates I-XI. 1891.

- Serial
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174. On some Lake Superior Entomostraca, by S. A. Forbes. Report for 1887, xv, pp. 701-718, plates I-IV. 1891.
 175. Notes on entozoa of marine fishes of New England, with description of several new species, by Edwin Linton. Part II. Report for 1887, xv, pp. 719-899, plates I-XV. 1891.
 176. Report of the Commissioner for 1887, xv, pp. I-LXIII, by Marshall McDonald. 1891.
 177. Statistical review of the coast fisheries of the United States, by J. W. Collins. Report for 1888, xvi, pp. 271-378. 1892.
 179. Report of distribution of fish and eggs from July 1, 1888, to June 30, 1889. Report for 1888, xvi, pp. 379-394. 1892.
 180. Report upon the investigations of the U. S. Fish Commission steamer *Albatross* for the year ending June 30, 1889, by Z. L. Tanner. Report for 1888, xvi, pp. 395-512, plates I-LII. 1892.
 181. Report of operations at the laboratory of the U. S. Fish Commission, Woods Hole, Mass., during the summer of 1888, by John A. Ryder. Report for 1888, xvi, pp. 513-522.
 182. Notes on entozoa of marine fishes, with description of new species, part III, by Edwin Linton. Report for 1888, xvi, pp. 523-542, plates LIII-LX. 1892.
 183. On the anatomy of *Thysanocephalum crispum* Linton, a parasite of the tiger shark, by Edwin Linton. Report for 1888, xvi, pp. 543-556, plates LXI-LXVII. 1892.
 184. A preliminary review of the apodal fishes or eels inhabiting the waters of America and Europe, by David S. Jordan and Bradley Moore Davis. Report for 1888, xvi, pp. 581-677, plates LXXXIII-LXXX. 1892.
 185. The chemical composition and nutritive values of food-fishes and aquatic invertebrates, by W. O. Atwater. Report for 1888, xvi, pp. 679-868, plates LXXXI-LXXXIX. 1892.
 186. Observations on the aquaria of the U. S. Fish Commission at Central Station, Washington, D. C., by William P. Seal. Bulletin for 1890, x, pp. 1-12 (including 2 figs.), plates I-IV. 1892.
 187. The fishing vessels and boats of the Pacific Coast, by J. W. Collins. Bulletin for 1890, x, pp. 13-48 (including 4 figs.), plates V-XVII. 1892.
 188. Observations upon fishes and fish-culture, by Tarleton H. Bean. Bulletin for 1890, x, pp. 49-61. 1892.
 189. Notes on a collection of fishes from the lower Potomac River, by Hugh M. Smith. Bulletin for 1890, x, pp. 63-72, plates XVIII-XX. 1892.
 190. A review of the *Centrarchidae* or fresh-water sunfishes of North America, by Charles H. Bollman. Report for 1888, xvi, pp. 557-579, plates LXVIII-LXXII. 1892.
 191. Report upon the participation of the U. S. Fish Commission in the Centennial Exposition held at Cincinnati, Ohio, in 1888, by J. W. Collins. Report for 1888, xvi, pp. 869-885, plate XC. 1892.
 192. Report of the Commissioner for 1888 (July 1, 1888, to June 30, 1889), including the reports on the division of fish-culture, scientific inquiry, and fisheries, by Marshall McDonald. Report for 1888, xvi, pp. IX-CXXVIII. 1892.
 194. Report on an investigation of the fisheries of Lake Ontario, by Hugh M. Smith. Bulletin for 1890, x, pp. 177-215, plates XXI-L. 1892.
 195. A report upon the fisheries of Iowa based upon observations and collections made during 1889, 1890, and 1891, by Seth E. Meek. Bulletin for 1890, x, pp. 217-248. 1892.
 196. Report of an examination of the rivers of Kentucky, with lists of the fishes obtained, by Albert J. Woolman. Bulletin for 1890, x, pp. 249-288, plate L. 1892.
 197. Notes on the streams and fishes of Clinton County, Ky., with a description of a new darter, by Philip H. Kirsch. Bulletin for 1890, x, pp. 289-292 (including 1 fig.). 1892.
 198. Report upon the rivers of central Florida tributary to the Gulf of Mexico, with lists of fishes inhabiting them, by Albert J. Woolman. Bulletin for 1890, x, pp. 293-302, plates LII-LIII. 1892.
 201. Observations on the hatching of the yellow perch, by S. G. Worth. Bulletin for 1890, x, pp. 331-334, plate LXI. 1892.
 202. The physical and biological characteristics of the natural oyster-grounds of South Carolina, by Bashford Dean. Bulletin for 1890, x, pp. 335-361, plates LXII-LXVIII. 1892.
 203. The present methods of oyster-culture in France, by Bashford Dean. Bulletin for 1890, x, pp. 363-388 (including 2 figs.), plates LXIX-LXXVIII. 1892.
 204. A contribution to our knowledge of the morphology of Lamellibranchiate Mollusks, by James L. Kellogg. Bulletin for 1890, x, pp. 389-436, plates LXXIX-XCIV. 1892.

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206. A statistical report on the fisheries of the Gulf States, by J. W. Collins and Hugh M. Smith. Bulletin for 1891, XI, pp. 93-184. 1893.
207. Description of a new sucker, *Pantosteus jordani*, from the Upper Missouri Basin, by Barton W. Evermann. Bulletin for 1892, XII, pp. 51-56 (including 1 fig.). 1893.
208. Report on a collection of fishes from the Albemarle region of North Carolina, by Hugh M. Smith. Bulletin for 1891, XI, pp. 185-200. 1893.
209. Observations on the spawning habits of the shad, by S. G. Worth. Bulletin for 1891, XI, pp. 201-206. 1893.
210. A preliminary report on the aquatic invertebrate fauna of the Yellowstone National Park, Wyoming, and of the Flathead region of Montana, by S. A. Forbes. Bulletin for 1891, XI, pp. 207-258, 1893, plates XXXVII-XLII. 1893.
211. Notes on a collection of fishes from the southern tributaries of the Cumberland River in Kentucky and Tennessee, by Philip H. Kirsch. Bulletin for 1891, XI, pp. 259-267. 1893.
212. Report on the fisheries of the South Atlantic States, by Hugh M. Smith. Bulletin for 1891, XI, pp. 271-356, plates XLIII-LXXXIV. 1893.
214. Report upon the European methods of oyster-culture, by Bashford Denn. Bulletin for 1891, XI, pp. 357-406 (including 2 figs.), plates LXXXV-LXXXVIII. 1893.
215. On the classification of the myxosporidia, a group of protozoan parasites infesting fishes, by R. R. Gurley. Bulletin for 1891, XI, pp. 407-420. 1893.
216. Report upon the investigations of the U. S. Fish Commission steamer *Albatross* from July 1, 1889, to June 30, 1891, by Z. L. Tanner. Report for 1889-91, XVII, pp. 207-241, plates I-II. 1893.
217. Report of observations respecting the oyster resources and oyster fishery of the Pacific Coast of the United States, by C. H. Townsend. Report for 1889-91, XVII, pp. 343-372, plates 3-12. 1892.
218. Report on the coast fisheries of Texas, by Charles H. Stevenson. Report for 1889-91, XVII, pp. 373-420, plates 13-27. 1893.
219. A review of the sparoid fishes of America and Europe, by David S. Jordan and Bert Fesler. Report for 1889-91, XVII, pp. 421-544, plates 28-62. 1893.
220. On fish entozoa of Yellowstone National Park, by Edwin Linton. Report for 1889-91, XVII, pp. 545-564, plates 63-67. 1893.
221. Planktonic studies: A comparative investigation of the importance and constitution of the pelagic fauna and flora, by Ernst Haeckel. Report for 1889-91, XVII, pp. 565-611. 1893.
222. Natural history of the useful aquatic reptiles and batrachians of the United States, by Frederick W. True. The Fisheries and Fishery Industries of the United States, sec. 1, pp. 141-162. 1884.
223. Natural history of mollusks in general, by Ernest Ingersoll. The Fisheries and Fishery Industries of the United States, sec. 1, pp. 687-710, plates 253-258. 1884.
224. Natural history of crustaceans, worms, radiates, and sponges, by Richard Rathbun. The Fisheries and Fishery Industries of the United States, sec. 1, pp. 763-850, plates 260-277. 1884.
225. The fishes of Texas and the Rio Grande Basin, considered chiefly with reference to their geographic distribution, by Barton W. Evermann and William C. Kendall. Bulletin for 1892, XII, pp. 57-126, plates X-L. 1894.
226. The fyke-nets and fyke-net fisheries of the United States, with notes on the fyke-nets of other countries, by Hugh M. Smith. Bulletin for 1892, XII, pp. 299-356, plates LXXXII-XCI. 1894.
227. The oyster industry of Maryland, by Charles H. Stevenson. Bulletin for 1892, XII, pp. 203-299, plates LVI-LXXI. 1894.
228. Summary of the fishery investigations conducted in the North Pacific Ocean and Bering Sea from July 1, 1888, to July 1, 1892, by the U. S. Fish Commission steamer *Albatross*, by Richard Rathbun. Bulletin for 1892, XII, pp. 127-201, plates LI-LV. 1894.
229. List of fishes collected at Sea Isle City, N. J., during the summer of 1892, by H. F. Moore. Bulletin for 1892, XII, pp. 357-380. 1894.
230. Economic and natural-history notes on fishes of the northern coast of New Jersey, by Hugh M. Smith. Bulletin for 1892, XII, pp. 365-380. 1894.
231. On the viviparous fishes of the Pacific coast of North America, by Carl H. Eigenmann. Bulletin for 1892, XII, pp. 381-478, plates XCII-CXVIII. 1894.
232. Notes on two hitherto unrecognized species of American whitefishes, by Hugh M. Smith. Bulletin for 1894, XIV, pp. 1-13, plate 1. 1894.
233. Extension of the recorded range of certain marine and fresh-water fishes of the Atlantic Coast of the United States, by W. C. Kendall and Hugh M. Smith. Bulletin for 1894, XIV, pp. 15-21. 1894.
234. Notes on fishes from the basin of the Mackenzie River, in British America. Bulletin for 1894, XIV, pp. 23-25, by Charles H. Gilbert. 1894.

- Serial
No.
231. An American fish in Finland, by Oscar Nordqvist. Bulletin for 1894, xiv, pp. 27-28. 1894.
 234. Two fertile cyprinoid hybrids, by Karl Knauthe. Bulletin for 1894, xiv, pp. 29-30. 1894.
 235. Report upon explorations made in Eel River Basin, in the northeastern part of Indiana, in the summer of 1892, by Philip H. Kirsch. Bulletin for 1891, xiv, pp. 31-41. 1894.
 236. Notes on the fresh-water fishes of Washington County, Me., by William C. Kendall. Bulletin for 1894, xiv, pp. 43-54. 1894.
 237. World's Fisheries Congress. Report of the secretary of the general committee, by Tarleton H. Bean. Bulletin for 1893, xiii, pp. 1-14. 1894.
 238. The assimilation of the fishery laws of the Great Lakes, by G. A. MacCallum. Bulletin for 1893, xiii, pp. 17-20. 1894.
 239. The decrease of food-fishes in American waters, and some of the causes, by A. M. Spangler. Bulletin for 1893, xiii, pp. 21-35. 1894.
 240. The sea and coast fisheries, by Daniel T. Church. Bulletin for 1893, xiii, pp. 37-38. 1894.
 241. Our ocean fishes and the effect of legislation upon the fisheries, by J. M. K. Southwick. Bulletin for 1893, xiii, pp. 39-45. 1894.
 242. The past, present, and future of trout culture, by W. L. Gilbert. Bulletin for 1893, xiii, pp. 47-48. 1894.
 243. The relation of scientific research to economic problems, by G. Brown Goode. Bulletin for 1893, xiii, pp. 49-58. 1894.
 244. Biological research in relation to the fisheries, by John A. Ryder. Bulletin for 1893, xiii, pp. 59-63. 1894.
 245. On the influence of light on the periodical depth migration of pelagic animals, by Jacques Loeb. Bulletin for 1893, xiii, pp. 65-68. 1894.
 246. The investigation of rivers and lakes with reference to fish environment, by B. W. Evermann. Bulletin for 1893, xiii, pp. 69-73. 1894.
 247. The habits and development of the lobster, and their bearing upon its artificial propagation, by Francis H. Herrick. Bulletin for 1893, xiii, pp. 75-86. 1894.
 248. The origin of the food of marine animals, by W. K. Brooks. Bulletin for 1893, xiii, pp. 87-92. 1894.
 249. Atmospheric and other influences on the migration of fishes, by J. J. Armistead. Bulletin for 1893, xiii, pp. 93-99. 1894.
 250. Some observations concerning fish parasites, by Edwin Linton. Bulletin for 1893, xiii, pp. 101-126, plates 1-8. 1894.
 251. On the food of the menhaden, by James I. Peck. Bulletin for 1893, xiii, pp. 113-126, plates 1-8. 1894.
 252. Some plankton studies in the Great Lakes, by Jacob E. Reighard. Bulletin for 1893, xiii, pp. 127-142, plates 9, 10. 1894.
 253. The aquarium of the U. S. Fish Commission at the World's Columbian Exposition, by S. A. Forbes. Bulletin for 1893, xiii, pp. 143-158. 1894.
 253. Description of the fresh and salt water supply and pumping plants used for the aquarium, by I. S. K. Reeves. Bulletin for 1893, xiii, pp. 159-161. 1894.
 253. Observations and experiments on saprolegnia infesting fish, by G. P. Clinton. Bulletin for 1893, xiii, pp. 163-172. 1894.
 253. Report on a parasitic protozoan observed on fish in the aquarium, by Charles Wardell Stiles. Bulletin for 1893, xiii, pp. 173-190, plates 11, 12. 1894.
 254. Statistical review of fish-culture in Europe and North America, by N. Borodino. Bulletin for 1893, xiii, pp. 193-196. 1894.
 255. Some notes about American fish-culture, by Oscar Nordqvist. Bulletin for 1893, xiii, pp. 197-200. 1894.
 256. Fish-culture in Michigan, by Hoyt Post. Bulletin for 1893, xiii, pp. 201-211. 1894.
 257. History and methods of whitefish-culture, by Frank N. Clark. Bulletin for 1893, xiii, pp. 213-220. 1894.
 258. Methods employed at Craig Brook Station in rearing young salmonoid fishes, by Charles G. Atkins. Bulletin for 1893, xiii, pp. 221-228. 1894.
 259. The propagation of black bass in ponds, by William F. Page. Bulletin for 1893, xiii, pp. 229-236. 1894.
 260. Fish and fishing in British Guiana, by J. J. Queleh. Bulletin for 1893, xiii, pp. 237-240. 1894.
 261. Fish cultural investigations at St. Andrews Marine Laboratory, Scotland, by W. C. McIntosh. Bulletin for 1893, xiii, pp. 241-256. 1894.
 261. Description of the marine hatchery at Dunbar, Scotland, by T. Wemyss Fulton. Bulletin for 1893, xiii, pp. 257-262. 1894.
 262. The past, present, and future of the oyster industry of Georgia, by A. Oemler. Bulletin for 1893, xiii, pp. 263-272. 1894.

Serial
No.

263. Deep-water oyster-culture, by Henry C. Rowe. Bulletin for 1893, XIII, pp. 273-276. 1894.
264. Breeding natural food artificially for young fish artificially hatched, by A. Nelson Cheney. Bulletin for 1893, XIII, pp. 277-279. 1894.
265. What we know of the lobster, by Fred Mather. Bulletin for 1893, XIII, pp. 281-286. 1894.
266. Remarks on the maintenance and improvement of the American fisheries, by Hugh M. Smith. Bulletin for 1893, XIII, pp. 287-292. 1894.
267. Reforms and improvements suggested for the fisheries of Great Britain and Ireland, by J. Lawrence-Hamilton. Bulletin for 1893, XIII, pp. 293-310. 1894.
268. Foul fish and filth fevers, by J. Lawrence-Hamilton. Bulletin for 1893, XIII, pp. 311-334. 1894.
269. Recent experiments in sturgeon hatching on the Delaware River, by Bashford Dean. Bulletin for 1893, XIII, pp. 335-339 (including 1 fig.). 1894.
270. The fisheries of Canada, by L. Z. Jonas. Bulletin for 1893, XIII, pp. 341-348. 1894.
271. The fishing industry of Lake Erie, past and present, by C. M. Keyes. Bulletin for 1893, XIII, pp. 349-353. 1894.
272. Notes on the Irish mackerel fisheries, by William Spotswood Green. Bulletin for 1893, XIII, pp. 357-360, plates 13-16. 1894.
273. Past and future of the fur-seal, by Joseph Stanley-Brown. Bulletin for 1893, XIII, pp. 361-370. 1894.
274. Notes on the fisheries and fishery industries of Puget Sound, by James G. Swan. Bulletin for 1893, XIII, pp. 371-380, plate 17. 1894.
275. Fish nets: Some account of their construction and the application of the various forms in American fisheries, by C. H. Augur. Bulletin for 1893, XIII, pp. 381-388. 1894.
276. Statistics of the fisheries of the United States, by Hugh M. Smith. Bulletin for 1893, XIII, pp. 389-417. 1894.
277. The fisheries of Japan, by Japanese bureau of agriculture, compiled by Hugh M. Smith. Bulletin for 1893, XIII, pp. 419-438. 1894.
278. On pearls, and the utilization and application of the shells in which they are found, in the ornamental arts, as shown at the World's Columbian Exposition, by George Frederick Kunz. Bulletin for 1893, XIII, pp. 439-457, plates 18-41. 1894.
279. Report on a collection of fishes from the rivers of central and northern Mexico, by Albert J. Woolman. Bulletin for 1894, XIV, pp. 55-66, plate 2. 1894.
280. Report of investigations respecting the fishes of Arkansas, conducted during 1891, 1892, and 1893, with a synopsis of previous explorations in the same State, by Seth E. Meek. Bulletin for 1894, XIV, pp. 67-94. 1894.
281. Notes on the capture of Atlantic salmon at sea and in the coast waters of the Eastern States, by Hugh M. Smith. Bulletin for 1894, XIV, pp. 95-100, plates 3 and 4. 1894.
282. Results of explorations in western Canada and northwestern United States, by Carl H. Eigenmann. Bulletin for 1894, XIV, pp. 101-131, plates 5-8. 1894.
283. Report of the Commissioner for the fiscal year ending June 30, 1892, including the reports on the divisions of scientific inquiry and fisheries, by Marshall McDonald. Report for 1892, XVIII, pp. VII-CCIV. 1894.
284. Report upon the investigations of the U. S. Fish Commission steamer *Albatross* for the year ending June 30, 1892, by Z. L. Tanner. Report for 1892, XVIII, pp. 1-64, plate A. 1894.
285. The myxosporidia or psorosperms of fishes, and the epidemics produced by them, by R. R. Gurley. Report for 1892, XVIII, pp. 65-304, plates 1-47. 1894.
287. The fisheries of the Great Lakes, by Hugh M. Smith. Report for 1892, XVIII, pp. 361-464. 1894.
288. Notes on the fishes of western Iowa and eastern Nebraska, by Seth E. Meek. Bulletin for 1894, XIV, pp. 133-138. 1894.
288. List of fishes inhabiting Clear Lake, California, by Charles H. Gilbert. Bulletin for 1894, XIV, pp. 139-140. 1894.
288. Notes on the fresh-water species of San Luis Obispo County, Cal., by David S. Jordan. Bulletin for 1894, XIV, pp. 141-142. 1894.
289. On the appliances for collecting pelagic organisms, with special reference to those employed by the U. S. Fish Commission, by Z. L. Tanner. Bulletin for 1894, XIV, pp. 143-151, plates 9-12. 1894.
290. The salmon fisheries of Columbia River, together with a report upon physical and natural history investigations in the region by C. H. Gilbert and B. W. Evermann, by Marshall McDonald. Bulletin for 1894, XIV, pp. 153-168, plates 13-15. 1894.
291. Notes on the oyster industry of New Jersey, by Ansley Hall. Report for 1892, XVIII, pp. 463-528. 1894.

- Serial
No.
292. Notes on fishes collected in Florida in 1892, by James A. Henshall. Bulletin for 1894, xiv, pp. 209-221. 1894.
293. Notes on a reconnaissance of the fisheries of the Pacific coast of the United States in 1894, by Hugh M. Smith. Bulletin for 1894, xiv, pp. 223-288. 1894.
294. Feeding and rearing of fishes, particularly trout, under domestication, by William F. Page. Bulletin for 1894, xiv, pp. 289-314. 1895.
295. Report upon investigations in the Maumee River Basin during the summer of 1893, by Philip H. Kirsch. Bulletin for 1894, xiv, pp. 315-337. 1895.
296. A statistical report on the fisheries of the Middle Atlantic States, by Hugh M. Smith. Bulletin for 1894, xiv, pp. 339-467. 1895.
297. The fishes of the Colorado Basin, by Barton W. Evermann and Cloud Rutter. Bulletin for 1894, xiv, pp. 473-486. 1895.
297. A list of species of fishes known from the vicinity of Neosho, Mo., by Barton W. Evermann and W. C. Kendall. Bulletin for 1894, xiv, pp. 469-472. 1895.
298. Report of the Commissioner for the fiscal year ending June 30, 1893, including the reports on divisions of fish-culture, scientific inquiry, and fisheries, by Marshall McDonald. Report for 1893, xix, pp. 1-138. 1896.
299. Fisheries of the Pacific Coast, by William A. Wilcox. Report for 1893, xix, pp. 139-304, plates 1-14. 1896.
300. The American lobster. A study of its habits and development, by Francis Hobart Herrick. Bulletin for 1895, xv, pp. 1-252, plates A-J and 1-54. 1896.
301. A preliminary report upon salmon investigations in Idaho in 1894, by Barton W. Evermann. Bulletin for 1895, xv, pp. 253-284. 1895.
302. Notes on an investigation of the menhaden fishery in 1894, with special reference to the food-fishes taken, by Hugh M. Smith. Bulletin for 1895, xv, pp. 285-302. 1896.
303. The fishes of the Neuse River Basin, by Barton W. Evermann and Ulysses O. Cox. Bulletin for 1895, xv, pp. 303-310. 1896.
304. Notes on intensive pond culture at Sandfort, by S. Jaffé. Bulletin for 1895, xv, pp. 311-316. 1896.
304. Notes on the rearing of yearling trout at Sandfort, by S. Jaffé. Bulletin for 1895, xv, pp. 317-319. 1896.
304. Fish-cultural methods at the Agricultural School at Freising. Anonymous. Bulletin for 1895, xv, pp. 320-321, plate 55. 1896.
304. The course of instruction of the Bavarian Fishery Association. Anonymous. Bulletin for 1895, xv, pp. 321-324. 1896.
305. Report on a reconnaissance of the oyster beds of Mobile Bay and Mississippi Sound, Alabama, by Homer P. Ritter. Bulletin for 1895, xv, pp. 325-339, plates 56-63. 1896.
306. A list of fishes and mollusks collected in Arkansas and Indian Territory in 1894, by Seth Eugene Meek. Bulletin for 1895, xv, pp. 341-349. 1896.
307. The sources of marine food, by James I. Peck. Bulletin for 1895, xv, pp. 351-368. 1896, plates 64-71. 1896.
308. Contributions toward the improvement of the culture of salmonoids and crawfish in small water-courses, by Karl Wozelka-Iglau. Bulletin for 1895, xv, pp. 369-378, plate 72. 1896.
309. A review of the history and results of the attempt to acclimatize fish and other water animals in the Pacific States, by Hugh M. Smith. Bulletin for 1895, xv, pp. 379-472, plates 73-83. 1896.
310. Report upon the work of the U. S. Fish Commission steamer *Albatross* for the year ending June 30, 1893, by Z. L. Tanner. Report for 1893, xix, pp. 305-341, plates 15-18. 1896.
311. Report of the representative of the U. S. Fish Commission at the World's Columbian Exposition, by Tarleton H. Bean. Report for 1894, xx, pp. 177-196, plates 1-5. 1896.
312. Report upon ichthyological investigations in western Minnesota and eastern North Dakota, by Albert J. Woolman. Report for 1893, xix, pp. 343-373, plate 19. 1896.
313. The food of the oyster, clam, and ribbed mussel, by John P. Lotsy. Report for 1893, xix, pp. 375-386 (including 4 figs.). 1896.
314. Establishment of stations for the propagation of salmon on the Pacific Coast, by John J. Brice. Report for 1893, xix, pp. 387-392. 1896.
315. Report of the Commissioner for the fiscal year ending June 30, 1894, including the report on the division of fish-culture, scientific inquiry, and fisheries, by Marshall McDonald. Report for 1894, xx, pp. 1-175. 1896.
316. The Russian fur-seal islands, by Leonard Stejneger. Bulletin for 1896, xvi, pp. 1-148, plates 1-66. 1896.
317. Remarks on the movements and breeding grounds of the fur-seal based on observations made while on the United States naval patrol of Bering Sea in 1894, by John J. Brice. Report for 1894, xx, pp. 573-577.

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318. A report upon salmon investigations in the head waters of the Columbia River, in the State of Idaho, in 1895; together with notes upon the fishes observed in that State in 1894 and 1895, by Barton W. Evermann. *Bulletin for 1896*, xvi, pp. 149-202, plates 67-72.
319. The artificial propagation of the rainbow trout, by George A. Seagle. *Bulletin for 1896*, xvi, pp. 237-256, plates 88-91. 1896.
320. The artificial propagation of salmon on the Pacific Coast of the United States, with notes on the natural history of the quinnat salmon, by Livingston Stone. *Bulletin for 1896*, xvi, pp. 203-235, plates 73-87.
321. Report upon the operations of the U. S. Fish Commission steamer *Albatross* for the year ending June 30, 1894, by Z. L. Tanner and F. J. Drake. *Report for 1894*, xx, pp. 197-278, plates 6-8. 1896.
322. Description of a closing tow net for submarine use at all depths, by C. H. Townsend. *Report for 1894*, xx, pp. 279-282, plates 9, 10. 1896.
323. The whitefishes of North America, by Barton W. Evermann and Hugh M. Smith. *Report for 1894*, xx, pp. 283-324, plates 11-28. 1896.
324. A report upon the fishes of the Missouri River Basin, by Barton W. Evermann and Ulysses O. Cox. *Report for 1894*, xx, pp. 325-429. 1896.
325. A review of the foreign fishery trade of the United States, by Charles H. Stevenson. *Report for 1894*, xx, pp. 431-571. 1896.
326. The ichthyological collections of the U. S. Fish Commission steamer *Albatross* during the years 1890 and 1891, by Charles H. Gilbert. *Report for 1893*, xix, pp. 393-476, plates 20-35. 1896.
327. An annotated catalogue of the fishes known from the State of Vermont, by Barton W. Evermann and W. C. Kendall. *Report for 1894*, xx, pp. 579-604.
328. A report upon the fishes of southwestern Minnesota, by Ulysses O. Cox. *Report for 1894*, xx, pp. 605-616. 1896.
329. List of publications of the U. S. Commission of Fish and Fisheries from its establishment, in 1871, to February, 1896, by Charles W. Scudder. *Report for 1894*, xx, pp. 617-706. 1896.
330. Deep-sea explorations: A general description of the steamer *Albatross*, her appliances and methods, by Z. L. Tanner. *Bulletin for 1896*, xvi, pp. 257-428 (including 76 figs.), pls. I-XI. 1897.
331. Report of the Commissioner for the fiscal year ending June 30, 1895, including the reports on the divisions of fish-culture, scientific inquiry, and fisheries, by Marshall McDonald. *Report for 1895*, xxi, pp. 1-123. 1896.
332. Report upon the investigations of the U. S. Fish Commission steamer *Albatross* for the year ending June 30, 1895 (abstract), by F. J. Drake. *Report for 1895*, xxi, pp. 125-168. 1896.
333. Notes on Biscayne Bay, Florida, with reference to its adaptability as the site of a marine hatching and experiment station, by Hugh M. Smith. *Report for 1895*, xxi, pp. 169-191. 1896.
334. The transplanting of eastern oysters to Willapa Bay, Washington, with notes on the native oyster industry, by C. H. Townsend. *Report for 1895*, xxi, pp. 193-202, plate 1. 1896.
335. Description of a new species of shad (*Alosa alabama*) from Alabama, by Barton W. Evermann. *Report for 1895*, xxi, pp. 203-205. 1896.
336. A check-list of the fishes and fish-like vertebrates of North and Middle America, by David Starr Jordan and Barton Warren Evermann. *Report for 1895*, xxi, pp. 207-584. 1896.
337. Report of the Commissioner for the fiscal year ending June 30, 1896, including the reports of divisions of fish-culture, scientific inquiry, and fisheries, by John J. Brice. *Report for 1896*, xxii, pp. 1-135, plates 1-10. 1897.
338. Report of the representative of the U. S. Fish Commission at the Cotton States and International Exposition at Atlanta, Ga., in 1895, by W. De C. Ravenel. *Report for 1896*, xxii, pp. 147-167 (including 3 figs.), plates 11-21. 1897.
339. Notes on the extension of the recorded range of certain fishes of the United States Coast, by Hugh M. Smith and William C. Kendall. *Report for 1896*, xxii, pp. 169-176. 1897.
340. Notes on the food of four species of the cod family, by William C. Kendall. *Report for 1896*, xxii, pp. 177-186. 1897.
341. The fisheries of Indian River, Florida, by John J. Brice et al. *Report for 1896*, xxii, pp. 223-262, plates 22-60. 1897.
342. Report on the fish and fisheries of the coastal waters of Florida, by John J. Brice. *Report for 1896*, pp. 263-312. 1897.
343. Report of a survey of the oyster regions of St. Vincent Sound, Apalachicola Bay, and St. George Sound, Florida, by Franklin Swift. *Report for 1896*, pp. 187-221, plate 21. 1897.

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