

Fishing in American waters

Pages: 659

Format: pdf, epub

Language: English

[[DOWNLOAD FULL EBOOK PDF](#)]

THE AMERICAN ASSOCIATIONS FISH, GAME, AND BIRDS OF SONG, THIS BOOK IS DEDICATED TO THE AUTHOR. PREFACE. As it might not be deemed kind in me to inflict upon the reader my thousand reasons for writing and illustrating this book with pencil sketches copied from life, I will therefore merely state that my experience of many years in the practice of the gentle art, which has led me through so many scenes of beauty and loveliness, has made me wish that all the world might learn the enjoyment conferred by the practice of angling. I have endeavored to portray the recreations of the angler in America, with his implements and his game; adding a small tribute to the temperate and industrious class of men who follow for a livelihood the hazardous business of fishing on the broad seas. An outline of the progress of fish-culture in Europe and America is also given, with pencil sketches illustrative of the art of hatching and rearing fishes, including stairs and fish-passes for enabling fishes to surmount mill-dams and &c. The fishes of our coast and estuaries, and the peculiar methods adopted for their capture, form not only a sealed book to Europeans, but to those anglers in America also who confine their recreations to fresh-water attractions. Each game fish affords a distinct interest, with peculiarities worth studying. My sketches may lack artistic finish, but possess the merit of correct outline; and in the words of Raphael, "The outline is the picture." The reader may be assured that fishing, whether for recreation or gain, entices its votaries to unexplored sources of revenue and pleasure. I am under compulsion to the following gentlemen: Francis Francis, of "The Field," author of "Fish-culture," and « A Book on Angling," has contributed valuable suggestions, which I am pleased to acknowledge. Isaac Mellen. To this accomplished poet I am indebted for contributing original verses to head my descriptions of several among our most important fishes. Thomas Tod Stoddart, whose "Angler's Companion" has afforded me both information and pleasure. Emile Blanchard, Member of the Institute and Professor of Natural History, Paris. James Eennie, M.A., Professor of Zoology, King's College, London. Walter Brackett, Artist, Boston, contributed the Brook Trout and Whitefish. J. B. Stearns, Brooklyn, E. D. Frontispiece of a Striped Bass, photographed from a picture painted by him. Seth Green, Mumford, N. Y. Fish-culture. Stephen H. Ainsworth. West Bloomfield, N. Y. Natural Spawning Race. Middleton, Carman, & Co., Fulton Market. Statistics of Fishes. Gilbert Comstock, Fulton Market—wholesale department. Fisheries Statistics. Andrew Clerk & Co., Maiden Lane. Samples of superior Flies and Split Bamboo Rods. Pritchard Brothers, Fulton Street. Artificial Flies and fine Bass-reel. Mr. M. B. Bride, Mumford, N. Y. Fine Trout-flies and Stained Gut lines. John Shields, Brookline, Mass. Specimens of excellent Trout-flies. CONTENTS. PART I. COAST AND ESTUARINE FISHING WITH ROD AND LINE. CHAPTER I. I. General Characterization of Fishes 17 II. Prerequisites for Fishing 23 III. General Habits and Senses of Fishes 27 IV. On Vision in Fishes 38 V. On Taste in Fishes 33 VI. On Smell in Fishes 86 VII. On Hearing in Fishes 38 CHAPTER II. I. Fecundity of Fishes 41 II. Voracity of Fishes 43 III. Times of Feeding and Habits of Fishes 44 CHAPTER III. I. Coast and Estuarine Fishes 46 II. Angling for Striped Bass 48 III. Trolling in Hell Gate 53 IV. Still-fishing for Bass 58 V. Casting-bait for Striped Bass 64 VI. Angling at the Bassing Clubs 69 CHAPTER IV. I. Weakfish or Squeteague 79 II. Southern Sea Trout 83 III. Sheepshead 84 IV. Angling for Sheepshead 93 • V. The Kingfish 95 VI. The Hopsh, 96; the Grunter, 99; the Golden Mullet, 100; the White Perch, 101; the Smelt, 103; the Spearing, 103;

the Cap- lin 105 VTI. The Sea Bass, 106; thePorgee. 108 VIII. The Family of the Wrasses or Rociifsh, 111; the Tautog or Blac- fish,115; the Flounder 116 IX. TheBlueflsh 117 X. The Spanish Maciccrel 126 XI. The Bonetta or Bonito. 133 XII The Cero, Cerus, or Sierra, 134; the Horse Maclsercl 135 PART IIL FRESH-WATER FISHING WITH FLT AND BAIT. CHAPTER I. I. The Poetry of Angling 141 n. The Brook Trout 146 Contents. BMtioii CHAPTER 11. vk» I. Flj-fishing on Massapiqua Lake 162 n. How to Fish a Stream 165 III. Knots, Loops, and Drops, 166; how to Stain Silk-worm 6nt, 170; Tront-reelft,172; Fiv-rodB, 178; Landiog-nete, 178; Tront-basket, 174; Bait-box, 174; Straightening Gaating-lines, 175; Nat-nral and Artificial Tront-fliea 176 CHAPTER IIL I. Middle Dam Camp 181 II. Select Artificial Tront-fliea, 184; Round Bend Fly-hoolu, 185; Fiflh-hook Philosophy 185 m. Bait-fishing for Tronl 189 CHAPTER IV. L Lesson by Josh BillIDgs, 191; the Ardent Angler 193 n. AngUng for ChUdren ^7; 198 CHAPTER V. I. The Salmon 202 II. Outfit for Salmon-fishing. 215 III. Departure for Salmon-fishing, 215; onr Start up the St. John 218 IV. The Encampment 222 V. Camping in the Wilderness, 228; a Moming^s Experience. 284 VI. History and RuminatiOn 236 VII. Jolly Sport on Rattling Run 241 VIII Fly-fishing below the Falls 244 IX. Thoughts of returning Homeward t. 251 X. The BilTer or Sea Trout, 255; the White Trout, 258; the Winnin-ish, 260; Red Trout of Long Lake, 262; Trout of Seneca and Cayuga Lakes, 268; the Mackinaw Trout 264 XL American Pickerel or Pike, 266; Skittering for Pickerel among Uie Lily-pads, 270; Still-baiting for Pickerel 271 CHAPTER VL I. Trolling among the Thousand Islands 274 II. The Maskinong^ 277 m. The Black Bass. 280; the Oswego Bass, 282; the Black Bass of the South, 284; the Spotted Bass or Speckled Hen, 285; Rock Bass of the Lakes 286 IV. The Sun-fish, 286; the Perch, 287; the Glass-eyed or Wall-eyed Pike, 288; the Whitefish, 290; the Lake Herring, 291; the Cisco or Ciscoquette, 292; the Shiner 294 V. Bait-con and Baits, 294; Spinning-baits, 295; HacketVs Spinning-tackle. 296: Ha&keirs TroIliDg-bait, 297: the Propelling Minnow, 2&S ; Buers Patent Feather Troll, 299; Spinning Tackle for Live Baits, 299; Spoon Victuals for Long-snouts, 8(»); Trolling Weather and Baits, 303; Fish-hooks, 804; Salmon-fiics, 806; Fly-dressing, 808; Mounting Salmon-hooks, 810; the Ponder-at&g Sinker 310 PART IIL COHMBBCIAL FISHBRIBa CHAPTER L Lake Fisheries 815 CoMTSirrs. xi CHAPTER II. COAST FISHES AND FI8HKBIKS OF THH TTNITBD STATES. SkUob Piif* I. The Mackerel 319 n. The Shad. 824 IIL The Mossbnker or Menhaden, S26; Menhaden for Bait—Frozen Herrings 828 IT. The CkMlfiBh—Catching and Curing it 828 CHAPTER IIL Whale Fishing, 833; the Striped Red Mnillet 338 CHAPTER IV. Salt-water Fisheries, 889; the Chesapeake Bay Fishery, 342; Findon Haddocks, 842; Preserving Food-fishes Fresh 343 PART IV. ANCIENT AND MODERN FISH-CULTURE. CHAPTER L The Art among the Ancients 847 CHAPTER»IL Fish-coltnre in Europe in Early Times 350 CHAPTER IIL Fish-culture of this Centuiy 855 CHAPTER IV. Natural Histoiy of the Salmon, 867; DcTelopment of the Salmon 371 CHAPTER V. I. Fish Propagation assisted by Art, 878; best Water for hatching Salmon, x2; special Directions about preparing Spawning-boxes, 386; securing the Ova of a Salmon, 387; Mr. Glllone^s Trocess of propagating Trout and Salmon, 388: Care in obtaining Fecun-dafed Spawn, 390; a simple Process for preparing a Spawninff-bed, 892: feeding young Trout or Salmon, 392; stocking old Ponds with Trout 393 n. Ainsworth's Race and Screens, 397; Furman^s natural Hatching Race, 401; "General Directions** by Seth Green, 403; every Farmer should haTe a Trout Preserve, 405; General Observa-Uons 406 CHAPTER VL Salmon Passes, Ladders, etc 407 PART V. A GUMPSB OF ICHTHTOLOGT. CHAPTER L L First Class of Fishes—Spine-rayed bony Fishes, 424; Second Class of Fishes—Soft-rayed bony Fishes, 428; Third Class of Fishes-Cartilaginous Fishes 432 n. The common Eel, 436; the Lamprey, 437; queer Fishes 439 zii Contents. PART VL SOUTHERN FISHES, AND HOW ANGLED FOB. CHAPTER I. P,^ Florida Fishes and Fishing 445 s«u<m CHAPTER II. I. Spot-tall Bass 460 II. The Red Snapper, 453; long-barred MnUet, 454; the Kingflsh, 455; croBs-barred^allet 456 HI. The Grouper, 456; theRedDmm 458 CHAPTER III. I. The Pompano, 460: the Crocus 461 II. TheCavallo,462; Lafayette: the Spot 463 m. The Vii^hila Hogflsh, 465; the Shadine, 466; the Silver, or Gray Mulled 466; the Black MuUet 467 CHAPTER IV. VHBSH-WATBB FISHES OF THE SOUTH. I. White Perch of Mississippi, 468; Southern Chub, or Trout 469 n. Chub-Robin, 470: the Bream 473 IIL The Channel Catfish t 474 PART VII. IOSCELLANEOnS FISHES, AND HOW TO TAKE THEM. CHAPTER L MISCELLAmBOUB FISHES. I. Lalte Trouts—The Togue, 479; the Siscowet 481 n. The California Salmon 483 m. TheGrayUng 485 CHAPTER IL I. The Red Bass of

Canada, 490: Otsego Lake Bass, 491; Genesee River Mullet, or Red Horse, 493f the Homed Dace 498 IL The Whiting—Whiting of Newport, Rhode Island, 494; the Ling, 495; Gurnard 7..495
APPENDIX Cookery adapted to the Resources of Sportsmen in the Wilderness or on the Wave. 497;
General Rules for Cooking, 512; Compounding Fancy Drinks, 514; General Remarks, 516;
Noteworthy Items, 517; American Game-laws, 631; a Word in Conclusion 553 fjMM 1.
Prootispiece—The Striped Bass. 47. S. Title-page.—An Angler's Oatflt. 46. 3. FirstFammes 17 49.
<4 Egyptian Gentleman Fishing SO 60. S. NameaoflNs 8451. <L Brain and Nerves of Fishes 80 52.
7. Artifldal Dragon-fly 8053. S. Angler's Natural Files 81.54. 9. Hooka for Estnary Fishes 4055.
10. The Striped Bass 4666. U. TacUe for Small Bass 6057. 12. Gteneral BassingTackle 5458. 13.
Trolling in Hell Gate 67 59. 14 Still-baiting for Bass 6960.]& Flaying a Bass in the Sorf 6561. le.
Baits, Thuml>-stall, Bait-spoon.... 67 63. 17. Shrimp and Prawn 7868. 1& Weakflsh or Sqaeteagne
79 64. 19L SonthemSeaTront 8265^ 80. The Sheepshead. 85 66. 51. Hooks and Sinkers for
Sheepshead 80 67. 52. TheKingflsh 9568. S3w Tackle for Kingflsh 97 09. 84. The HogiiBh ^ 9670.
88. TheOmnter 99 71. 86. The Golden Mullet 100 78. 27. The White Perch 10173. SSL The Smelt
108 74. 89l Cast for small Fishes 103 75. SO. Spearing or Silrerside 104 76. 8L TheCaplin. 106 n.
82. Sea Baas 106 73. 53. Poigee 109 79. 54. Wrasses or Bockfish Ill 80. 35. TheBlneflsh 11781. 36.
Blaefish Sqnids 180 82. 87. The Flying Fish 12183. 8& Trolling for Blneflsh 188{84. 38. The TroUer
made Bait of 182,85. 40. The Spanish Mackerel 127i86. 41. Spaniah Mackerel Feeding 130 87. 48.
Spaniah Mackerel Sqalds 181 83. 43. Bonetta or Bonito 182 89. 44. Cero or Sierra. 18490. 46.
Harpooning 18691. 46L Horse Mackerel 186198. FAom Habits of Fishea 187 Poetry of Angling
141 Brook Trout 147 A Poacher 108 Fly-flshlng 160 Troating Tackle 109 Splice for Fly-rods 160 A
pair of Flies 161 Angling on Massapiqua 16S Fly and Minnow Hooks 164 How to Fish a Stream 160
Knots, Loops, and Drops 167 Trout-fliea 177 An Aquarium 180 Middle Dam Camp 181 Select
Trout-ffies 184 Fly Hooks 180 Different Bends 180 Plate of Trout-flies 188 JoshBiUings 191 The
Ardent Angler 198 Green or Gray Drake Fly. 197 Going a Fishing 198 Erening 801 The Salmon 809
Hat and Salmon-rod 808 Gaff-hooks 814 Fishing Bquipment 810 Getting a Bite. 810
Encampment 883 Camp Bed 889 Pool below the Chute 840 Silver or Sea Trout 856 The White
Tront 850 The Winninish 860 Red Trout of Long Lake 868 Trout of Seneca Lake 864 The Mackinaw
Trout 865 Pickerel or Pike 866 Open Countenances 867 Skittering for Pickerel 870 Still-baiting for
Pickerel 878 Dragon-flies 873 Trolling—Th6 Thousand Islands.. 874 The Maskinong^ 878 The
Black Bass «.. 881 List of Illustrations. 93. The Oflwego Bass M. Black Basfl of the South 96.
Spotted Bass or Speckled Hen.... 96. Rock Baas of the Lakes 97. Snnflsh 98. The Perch 99.
OlasB^yed Pike. 100. Whiteflflh IOL Lake Herring 108. Cisco or CisMqnette 108.
Shiner—natoral Size 104. Bait-can 10& Spinning Tackle IOA. Spinning Baits 107. Spinning
Tackle for Live Baits... 105. Feathered Spoons 109. Fish-hooks 110. Salmon Flies 111. Mounting
Flies 112. Ponderating Sinkers 118. Indian Summer 114. Hammer-headed Shark 116. The
Mackerel 116. Shad, Menhaden, Herring 117. TheCodflsh 118. TheJohnDory 119. Whale
Fishing.* 120. Harpooned 121. Striped Red Mullet. 182. A surprised Codfish 128. Morning
134. Ancient Fish-culture 126. Modem Fish>cnltntre 186. Cuttle-fish 187. History of the Salmon
188. Salmon Ooa and Alevin 189. Salmon Fry 180. Parr Bight Months Old 181. Parr Fifteen
Months Old 188. Smolt Fifteen Months Old 183. The Grilse 184. Adult Salmon 185.
TheSwordflsh 136. Hatching-bozes. 187. Hatching-race, Tray, and Grille.. 188. Siphon and
Pincers 189. Gathering Salmon Bggs 140. Stripping a Trout 141. Feeding Young Trout 148.
Ainsworth*s Hatching-race. 148. AHardLeap 144. Salmon Leaps 146. Ballysadure Salmon-pass
146. Sllgo Salmon-stairs 147. Canadian Salmon>4tairs 148 Horisontal Screen 149. Current
Wheel 160. Ichthyology 884;i61. 884168. 886168. 886'164. 887156. 887 889 890 166. 167. 168.
892,169. 160. 161. 161 893 894 896 997il68. 89S;i64. 800166. 166. 167. 168. 169. 170. 171.
178. 803 806 807 809 811 811 818 380178. 824 829 881 882 883 838 339 844 347 366 366 867 372
373 873 374 876 376 877 377 383 8R4 386 387 391 393 897 407 411 413 415 416 419 419 423 174.
176. 176. 177. 178. 179. ISO. 181. 188. 183. 184. 186. 186. 187. 188. 189. 190. 191. 198. 198. 194.
196. 196. 197. 198. 199. 200. 201. 802. 203. 204. 206. 206. 207. 908. PAOB Pike-perch 483
Spine-rayed Fishes 424 " 486 " *• 486 The Pilot-fish 486 Roach and Dace 427 The Carp Family
423 The Pike Family 489 Salmon and Trout Family. 429 The Cod Family 430 Flatfish Family 431

Sharks 435 Sturgeon and Chimflera 438 Ray Family 433 Catfish Family 438 Grenouille 434 The common Eel 436 The Lamprey 437 Estuary Catfish and Silnre 440 The short Sunflsh 448 Spot-tail Bass 460 The Red Snapper 468 The Long-barred Mullet 464 TheKingfish 456 The Cross-barred Mullet 456 The Grouper 456 The Red Drum 468 The Pompauo 460 The Crocus 461 The Oavallo 468 Lafayette: The Spot 463 Virginia Hogfish 466 TheShadine 466 The Gray Mullet 466 The Black Mullet 467 Float , 467 White Perch of Mtf«8ifls1ppi 468 Southern Chub, or Trout 469 Chub-Robin 470 The Bream 472 Channel Catfish 474 The Togue 479 The Siecowet 481 The Jolly Angler 483 California Salmon 484 The Grayling 486 A DI saster 490 Canadian Red Bass 490 Otsego Lake Bass 491 Mullet, or Red Horse 498 The Homed Dace 493 Whiting of Newport 494 The Ling 495 TheGumard 496 Cootery 497 Reel to Dry Lines 517 Feet Dress for Field-sports 680 Invitation to the Streams 681 ON COAST AND ESTUARY FISHING WITH EOD AND LINR FISHING IN AMERICAN WATERS. CHAPTER I. GENERAL CHARACTERIZATION OF FISHES. SECTION FIRST. ON seriously contemplating the immensity of the watcre and their Innumciahle inhabitants, it is not difiiciilt to realize tlic importance of these branches of material and animal nature, and I nhall consider myself fortunate if able to present reasons sufficient to induce the employment of ait amount of time at all commensarate with the iii-oper division of labor between land and water for the pnvposes of health, wealth, and iveration. Not only has a laiger portion of this terraqueous ball been bequeathed to fish-kind than to maukitid, but " its first families" were also more richly endowed by Pi-ovidence in beauty of form and of coloring. There was a perio<l wlien all the iu-habitantR of this planet were fishes, previously to the sublime moment when "Goi> said *Let the dry land appear." Tlie ancients thought that the illimitable bcanties of the waters were reflected in the heavens; hence they gave to the eon-Btellaticns the naiues of fishes. Thus, prior to the time of B Galileo, when the earth was believed to be a great flat plain, the celestial expanse was divided by them into the northern and southern constellations, the most iippoitant of which were named after their favoiite fishes. Out of the legends connecting these fishes with heathen divinities there have been evolved and handed down to us, revised and improved, the signs of the zodiac, indicated in almanacs by the figure of a man, which signs are still reverently consulted by both sailor and angler; and the latter is never confident or hopeful of great success unless the sign be above the loins. Whether or no this be a supei'stition bequeathed by the ancients I have not bestowed much time in examining, but plead guilty to the weakness of individual faith, and feel confident of good sport only when the sign is in the head, stomach, or bowels, but never when it is in the legs or feet. Man, from his inferior share of the earth's surface, to which little space he appeal's confined without a fin to dive or a wing to soar, contemplates with pleasure the scintillating heavens; while the sublime roar of the ocean, its breakers beating the shores into fragments with its billowy battalions in close lines, and in storms booming like thunder, penetrate his soul with awe and reverence at the power manifested, to which, in comparison, his own is nothing. But it is not my intention to estimate the power of the waters, or their value for bathing or manufacturing purposes. My object is to show the reader the attractions of angling, and to convince him that wherever commensurate efforts have been made, the waters have yielded greater profits to his toil or skill than the land. I strongly advocate the maintenance of a largo maritime jx)wer. As a means of wealth, the experience of the British Isles—isolated, and comparatively insignificant on the map of the world as they are— proves that nothing is too exalted to be hoped for by a liberal maritime power. But it is the wealth of the watere in the riches of their inhabitants to which I would chiefly invite attention. As to the intelligence of fishes, comparatively lit- tie is known; bat I feel assured that they would rank higher in the " scale of entities" than the fouilli class of vertebrate animals, accorded them by Cuvier, did all men of thought and science appreciate and pursue fishing. Fishing, as a term, is general; while angling is a special kind of fishing. The word angling is supposed to have been derived from the bend of the hook, forming an angle; but the origin or antiquity of the term is comparatively unimportant now. It is sufficient to know that the art of angling " requires as much enthusiasm as poetry, as much patience as mathematics, and as much caution as housebreaking." That field-sports were among the earliest and most respectable pastimes of the ancients, we have abundant evidence from their poets and philosophers, such as Aristotle, Plato, Cicero, and Horace; and that angling was practiced " with much success and love of

the sport is evident from the *Ilali-eutics* of Oppian, the only Greek poem now extant on this subject;" but we learn from Atheneus that several other writers had written treatises or poems upon fishing some centuries before the Christian era. "Fishing was a favorite pastime of the Egyptian gentleman, both in the Nile and in the spacious * sluices, or ponils for fish,* constructed within his grounds, where they were fed for the table, and where he amused himself by angling, and the dexterous use of the *bideit*^ a two-pronged spear for striking two fish at a time. These favorite occupations were not confined to young *jei*-sons, nor thought unworthy of men of serious habits; and an Egyptian of rank, and of a certain age, is frequently represented in the sculptures catching fish in a canal or lake, with the line, or spearing them as they glided past the bank. Sometimes the angler posted himself in a shady spot by the water's edge, and, having ordered his servants to spread a mat upon the ground, sat upon it as he threw his line; and some, with higher notions of comfort, used a chair, as 'stout gentlemen' now do in punts. The rod * Isaiah xix., 10. t Isaiah xix., 8. *FisHiHO IN Amebican Wateeb.* ' *Aa Eypylliu geiULL-mau nsblng.* was short, and apparently of one *i>*iece; the line usually single, though *Histanccs* occur of a double line, each with its own hook, which was of bronze. In all cases they adopted a ground bait, as is still the custom in Egypt, without any float; and though several winged insects are represented in the paintings hovering over the water, it does not appear that they ever put them to the hook, and still less that they had devised any method similar to our artificial-fly fishing, which is still as unknown to the unsophisticated modern Egyptians as to their fish." Prime kinds of fishes are, and have for some years been, in the cities of this country, expensive articles of diet. It was so in Athens; and the following poem, quoted by Athenaeus from "The Purple" of Xenarchus (Yonge's translation), is presented for the benefit of those who retail stale fish from stands along the streets: "Fishes are nonsew; for they never *nj* A single thing that's new. But *oU* they; do *Ja lo* clothe old ideas in language new; Taming the stilted things o'er and o'er again, And *n |ji^i<*ie down. But *ua to tiahmongeni.* They're an inventive race, and yield to none In shameless conduct. For as modern laws Forbid them now to water their stale fish, Some fellow, hated by the gods, beholding His fish quite dry, picks with his mates a quarrel. And blows are interchanged. Then when one thinks He*8 had enough, he falls and seems to faint, And lies like any corpse among his baskets. Some one calls out for water; and his partner Catches a pail, and throws it o'er his friend So as to sprinkle all his fish, and make The world believe them newly caught and fresh.*" In regard to propagating fishes, the experiments of the ancients amounted to little more than robbing the nests of *hei^* bivorous fishes, and planting the eggs in other waters; but the moderns have, within the past thirty years, invented successful theories for studying the habits of fishes at their aqueous homes, in rapid streams, or placid lakes, and deep down into the depths of old ocean. As these will be explained in this work under their appropriate titles of ancient and modern fish culture, I merely allude to them in passing as having— through their developments of the habits of fishes—opened up a subject so attractive as to have induced anglers and men of science to study more assiduously and minutely these creatures of elegant forms, whose colors vie with the rainbow, and reflect the hues of every precious stone. See their scintillant scales, their metallic rays, and colors more beautiful than are given to birds of most favored plumage! What satin sheen, *aurora borealis*, or heavenly sunset can vie with the prismatic colors of the living trout or the dying dolphin? What gold so finely burnished as the spots on the Spanish mackerel? or what shade of carmine so brilliant as the spots on a samlet? What so transcendently lustrous and beautiful as a fresh-run salmon? The Spanish mackerel, salmon, and bonetta combine to form the models for the speed and beauty of our ships. Even as far back as the Revolutionary War, one of our ships was named "Bonetta." In symmetry of form and beautiful coloring, fishes stand at the head of animal creation. SECTION SECOND. PREREQUISITES FOR FISHING. In order to pursue with success any branch of fishing, a knowledge of both the senses and habits of fishes is essential. Angling is one of the most ancient methods of fishing, as proven by the centre-draught hook exhumed at Thebes and at Pompeii. The hook used in China, when that realm was first discovered by the Christians, was quite similar in bend, and all of the ancient models left nothing to desire but a barb, which is the only improvement made in the shape of the common fish-hook within three thousand years. And it is worthy of remark, that the bend of the ancient hook is so like the best

hooks of the present day—eminently the O'Shaughnessy and the American Kinsey, the latter known as the Pennsylvania hook—that some suspect ours to be a copy of the ancient bend, with the addition of an Aberdeen barb. Our age, however, has surpassed all others in artificial disguises to lure the finny tribes, and take the conceit out of them a thousand-fold faster than ever could the ancients. The habits of fishes to be fished for, whether by angling or any other means, should be carefully studied. So also should their food. ^* Fiiih have their various characters defined, Not more by color than by mind." They have their times to eat and their choice of food. Thus the trout will take ground bait or minnows as substantial food, but for his dessert he prefers rising to the surface for flies. That most fresh-water fishes fast previous to important rain-storms I think has become settled by the experience of old anglers. Their appetite appears to be improved by a shower. Most fishes seem to scent the approach of a shower, and know by instinct that, with the debris carried down by a rise in the stream, they will find a variety of food from which to select. Pike generally bite eagerly when it rains; and both trout and salmon will rise to the fly most readily daring a fall of snow or rain. Indeed, a snow-storm seems to improve the appetite of some fishes; and rains which do not render the stream too turbid, but give to the water a slightly-darkened tint, do not injure it for even fishing with the fly. It is a commonly received opinion that angling is not as good as usual during easterly winds; but this is only true when the winds cause the tides to rise so high on our coast that fishes change their feeding-grounds. Fly-fishing for both salmon and trout are, in some waters, best during an east wind. A really windy day is not good for fly-fishing. The gentle, balmy breeze, which merely produces a catspaw ripple on the surface, and carries the cast of flies out, so as to leave part of the merit for their graceful and snow-flake fall to the angler and the rod, under "a sun of mild but not too bright a beam," form a few of the conditions which give flyfishing its peculiar zest. The prejudice against an east wind with the American angler on the Atlantic slope near the coast is probably caused by the fact that an east wind so raises the tides along the shores, and sets it back in the estuaries and creeks, as to cover shoals and islets of eel-grass. This gives fishes a wider range to forage and prospect over shallow and weedy places for shrimp, shrimps and soft-shell crabs, instead of remaining in the tideway to watch for bait carried along by the current. To converse intelligibly about fishes, it is necessary to know the names of their fins, for these give the means of locomotion; and though this work is not intended as a school-book, or to be especially scientific, yet, as all retailers of fish-stories should know enough of a fish to name its fins, I present on the following page the form of a fish, with the names of them. The propulsive power of a fish is its tail or caudal fin. The pectorals and ventrals assist a little in speed, but more especially in turning and diving, while the anal and dorsals serve as centre-boards to a ship, to prevent leeway and being easily capsized. Of rapid swimmers in the American waters, the Herring, the Word-fish, Spanish mackerel, and the salmon are considered the swiftest of the forked-tails; but the salmon has not, fitly speaking, a forked tail; it is more properly crescent-shaped. Of square-tail, the brook trout, squeteague, and Southern estuary trout are the swiftest swimmers. SECTION THIRD. GENERAL HABITS AND SENSES OF FISHES. Generally speaking, the principal habits and instincts of a majority of the finny animals consist in eating and protecting themselves from being eaten. The fact that over two-thirds of the surface of the globe is covered by the sea, and that large parts of continents are covered by lakes, traversed by rivers, and occupied by marshes, proves the impossibility for man to have scanned with perspicacious eye the principal marked peculiarities of a majority of the families which dwell deep down in the bosom of old ocean, however industrious he may have been in such research. Though the Chinese had understood fish culture many centuries, yet we date our practical knowledge of this art from A.D. 1837, when Mr. Shaw, of Scotland, expounded the theory in Blackwood under the head of "The Transmission of Fishes" and M. Gélien, of the Vosges, in France, began to cultivate fish by artificial propagation. We now know that the difference in the species of fishes is no greater than is the diversity of their habits. Some are solitary, and others gregarious; some great wanderers, others restricted within narrow limits; some are surface-feeders, like the mackerel families, others bottom fish, like the flounders and the flat-fish family; some prefer a sandy bottom, as the kingfish, others a rocky, as the striped bass; and yet others rejoice in mud, as the eels and catfish, with the rest of the silurus family. Some fish prefer

indications of better sight than most sea fishes. Anglers of great experience and acknowledged judgment select baits, whether live minnows, or such artificial lures as flies, squids, etc., which contrast strongly with the water and the color of the clouds. What angler does not know that a shiner is the best bait to spin for trout on a dark day? The sight of fishes is too imperfect to enable them to decide between friends and enemies. A shadow cast upon the water, whether by a sloop, seal, otter, or an angler, frightens them. Sir Humphry Davy illustrates the truth of this theory by the anecdote that some man, while walking up Bond Street from one of the club-houses with an illustrious personage, laid a wager that he would see more cats than the prince in his walk, and that the latter might take which side of the street he liked. When they arrived at the end the prince had not seen one, while the other had counted thirteen. The explanation was that the prince had selected the shady side of the street, while the other person chose the sunny side, knowing that cats prefer sunshine. Sir Humphry, in his "Salmonia," gives the following advice to students at angling: "You have been, naturally enough, fishing with your backs to the sun, which, not being very high, has thrown the shadows of yourselves and your rods on the water, and you have alarmed the fish whenever you have thrown a fly. You 'see I have fished with my face toward the sun, and, though inconvenienced by the light, have given no alarm." James Rennie, M. A., states that indistinctness in the vision of fishes proves the fallacy of the routine angler, who fancies the fishes are so well versed in colors and forms of particular flies as to refuse other sorts in some seasons and on particular days, and even at different periods of the same day. "Nothing can be more preposterous than such a notion, universal though it be among the most experienced anglers; yet this theory is founded on natural philosophy, but the result is to be accounted for on an entirely different principle.*" Daniell states *' there is no evidence of any fishes seeing a considerable distance, and the conduct of many of them, that, are deceived by different baits prepared in imitation of their food, gives room to suspect that objects are not very distinctly perceived by them, even when near." Light seems peculiarly attractive to fishes, as proven by their surrounding a diving-bell with a light in it. Walter Scott, in his Guy Mannering, describes the plan adopted in Scotland for attracting fishes by grates of living coal, or torches carried by the fishermen as they wade shallow streams for the purpose of spearing. When a fish is thus discovered, it remains fascinated by the glare of light, seldom makes an effort to escape, and is easily speared. This is one of the many devices by which the Indians and vagrant whites kill the salmon and trout while on their spawning-beds, both in Maine and in the dominion of Canada. The Chinese catch fish by employing two narrow boats, with a board painted white and varnished nailed to them, so as to slope outward and almost touch the water, and so as to reflect the light of the moon. Toward these boats the fish dart, and, falling on them, are caught with ease. From the pretended imitations of baits and flies for capturing fishes may be logically deduced the fact that fish are near-sighted, and do not perceive with great distinctness any minute object, however near to them. The most successful artificial baits to troll with for the fishes of our lakes and rivers are thus arranged: a pair of hooks disguised by a few gaudy feathers:—bright red and white being the most successful colors—and at the shank of the hook is placed a piece of silver, brass, or copper, of oval or diamond shape, so arranged as to revolve rapidly, and appear as little like any thing living in or out of the water as possible. What is known as the common " spoon," made with swivels, and a shoulder on the shank of the hook, so as to revolve rapidly by drawing it through the water, is frequently a more captivating lure than a live fish. In trolling for bluefish, a piece of lead or bone five inches long forms a more successful lure than the sea-shiner which is its principal sustenance; and a piece of pearl, five inches long by half an inch in diameter, either round or oval, is the most attractive troll for Spanish mackerel; while a plain piece of red flannel, attached to a piece of lead and drawn quickly through the water, is often the only bait used by heavers and haulers for bluefish, who fish for a livelihood. Of artificial flies, I know that gaudy colors are generally preferred by the black bass, while the red ibis is one of the most attractive lures for trout in the waters of Long Island, and in many streams and lakes remote from the sea-board. Of course the red ibis fly does not imitate any winged insect seen on the waters of the State of New York. Its adoption resulted from the frequent rises of trout to the red float while fishing with bait I scarcely suppose a critic will be found willing to risk his reputation, however slender, upon insisting that a

red float is the imitation of some water-fly. Anglers generally regarded these trout-leaps at the float as a whimsical caprice of theirs while on a spree. Not so, however, with Judge Philo T. Ruggles and Mr. Finn, two among the best fly-fishers in the state. They concluded to test the fancy of trout by offering them a rod fly. Accordingly, Mr. Finn bought a red ibis of a taxidermist, and employed a fly-tyer to make it into flies. The result was a success; and the fly-tyer, who was presented with all of them but a couple of dozen, actually made money enough by the sale of them to set himself up in the fishing-tackle business. Early in the season this is the most killing fly on Long Island, though perhaps not for large fish, which generally prefer the fly made of a claret body, brown mallard wing, and tail of the top-knot from the golden pheasant; or the blue professor, with blue silk body and dark gray wings. With the following remarks from a clever writer on angling in the Encyclopedia Britannica, and a few comments on them, I shall dismiss the subject of the vision of fishes: "It may be asked upon what principle of imitative art the different varieties of salmon-fly can be supposed to bear the most distant resemblance to any species of dragon-fly, to imitate which we are frequently told that they are intended?" The reader will please compare the artificial dragon-fly with a true copy of a natural one on the following plate of salmon and trout flies: 1. Commo OTBgoa-Oy. i. Tbc Ag-rton I>nii;ini-llT. 8. D<y-llT, or Msj-By. 4. flrnh or larva of Ibe BBine. ^ Uuraefl CoTjiam. t. A HultDpuL 1. Tba migaUlad cUw o[tha Hutlepao. Of the dissimilarity of the artificial flies to the natural ones, the same may be generally said and prove true, whether for salmon, trout, maskinong, pickerel, black bass, bluefish, Spanish mackerel, and all other surface feeders. Besides, the pretended imitations are used several months earlier in the year than nature produces their originals; thus, while the finest salmon-fishing in Europe is during the spring months, the dragon-fly is a summer insect, and rarely makes its appearance until June. If artificial flies have no resemblance to natural ones, how much more unlike must they be when, instead of being swept down by the current, as a real one would be, the artificial fly is seen crossing and recrossing every stream and torrent with the agility of an otter and the strength of an alligator? Now, as it is demonstrable that the artificial fly generally used for salmon bears no resemblance, except in size, to any living one; that the only insect which it may be supposed to represent does not exist in the winged state during the period when the imitation is most generally and most successfully used; and if they did, their habits and natural powers totally prevent them from being at any time seen under such circumstances as would give a color to the supposition of the one being even mistaken for the other, may we not fairly conclude that, in this instance at least, the fish proceed upon other grounds, and are deceived by an appearance of life and motion rather than by a specific resemblance to any thing which they had previously been in the habit of capturing? What natural insect do the large flies and spoons at which sea trout, lake trout, black bass, etc., bite, resemble? These, as well as salmon, frequently take the lure far within the bounds of salt-water mark, and yet materialists know that no such thing as a salt-water fly exists. Indeed, no true insect inhabits the sea. What species are represented by the palmer, or by three fourths of the dressed flies in use? An artificial fly can, at the best, be considered only as the representative of a natural one which has been drowned, as it is impossible to imitate the dancing or hovering flight of the insect over the surface of the stream, and, even with that restricted idea of its resemblance to nature, the likeness must be scarcely perceptible, owing to the difference of motion and the great variety of directions in which the angler draws his flies, according to the nature and locality of the current and the prevailing direction of the wind" The sight of fishes is like that of all animals with round and convex eyes. If the angler will stand quite still in the water, fish will not fear to congregate about him, or to flap his legs with their fins; but with his slightest motion they dart to their hiding-places. The convexity of the eye produces shortsightedness in man as well as in quadrupeds, birds, and fishes. The round eye is inferior to the almond-shaped for distinguishing form: thus round-eyed animals and fishes mistake a man for an inanimate object, and, from their shortness of vision, approach him without fear. These general and specific reasons convince me that fishes are shortsighted; and that, while quick to detect action, they are slow to distinguish form. SECTION FIFTH. ON TASTE IN FISHES. The sense of taste in both birds and fishes, which subsist on similar food, is less acute than in other animals, a circumstance strongly indicated by the

hard, gristly texture of the tongue when it exists, which it may scarcely be said to do in all fishes, though it is very distinct in the *Cyprinus* and rather less so in the genus *Salmo*, Dr. Rennie states that numerous experiments made by him on birds whose food consists of small fruit and insects, which they swallow without breaking, leads him to conclude that they choose some and reject others, not by taste, but by touch, probably aided by smell; and he adds, "I have no doubt it is the same with fishes; at least it is obvious, from their so generally swallowing their food without chewing or bruising it, that, even if they possessed acute taste, it could not aid them in the discrimination." C The large tongue in the carp may have been providentially furnished to give it a more acute taste for preventing it from being poisoned by eating water hemlock, or other deleterious plants, as it is known to feed on water-plants. That all fish are not thus provided with taste sufficiently acute to enable them to reject what is poisonous, appears from the practice of poachers in poisoning fish by pulverizing and making a paste of fisher's berries, or *Cocculus indicus* which they form into balls about the size of peas and cast into the water. Fish greedily swallow these, and, becoming intoxicated or palsied thereby, float to the surface of the water and are easily caught, or soon die. Chub and dace are ready victims to this device, as are also the black bass, Oswego, yellow, white, rock, and all the varieties of lake and river bass. It is always dangerous to purchase fish out of season any where; but residents of cities should be especially careful who they purchase from, and the safest houses are those which deal largely with fishing firms of established reputation. Teeth of fishes appear destined more especially for laying hold and detaining their prey than for chewing. With this view they are bent inward, like tenter-hooks, so that fishes, howsoever small and slippery, are forced back into the gullet, and their escape or return prevented. It is no doubt with the same design that the throats of many fish are studded with what M. Bory St. Vincent terms a pavement of teeth. Such fishes as have teeth thus placed far back on the palate and upper part of the throat, while in their jaws they have none, are termed by anglers "leather-mouthed," but technically *malaostomata*. Anglers of the British Isles reckon among the principal of leather-mouthed fishes the minnow, gudgeon, roach, loach, bleak, chub, daces, barbel, bream, rudd, tench, carp, and other minor fishes. The salmon and the pike have teeth in the jaws and in all parts of the mouth, and the perch in all parts of the mouth except the tongue. The sturgeon and sucker, again, have no teeth whatever. The division of anglers' fishes into such as are and such as are not leather-mouthed may be important to the young angler, as different management is required in playing each. Old anglers considered such fishes leather-mouthed as have their teeth in the throat. Hooks seldom part their hold from the mouths of such fishes, which are not generally regarded as gamy, though good sport for ladies and youth. But the contrary is the case with the striped bass, squeteague, pickerel, maskinonge, perch, and most game fishes which are white-meated. These have a bony mouth, and not much flesh or skin to hold a hook; therefore you are never sure of landing these fish unless you play them so lightly as not to permit them a foot of slack line, except, perchance, they have gorged the hook. That water-grasses and some other plants are partly the food of leather-mouthed fishes, especially of the carp genus is unquestionable; and in the Orient herbivorous fishes are considered the most delicate and highly prized. But when they feed on liver, brewers' grains, boiled barley, split peas, and the like, they probably mistake these for the eggs or cocoons of water animals, inasmuch as they could not procure a supply of these except by rare accident. That some fish may feed on the seeds of such plants as are scattered about the water is not improbable, and it may have been from observing this that it is recommended by Lebault and Debrau, after removing the fish to let fish-ponds dry, to sow them with oats or other grain, and, when it is ripe, to let the water again into the pond, and bring back the fish to feed. Bowker remarks that carp will eat barley, wheat, or oaten bread, while tench and perch will not touch it. Of course perch prefer meats to vegetable diet; but as the tench differs with the carp upon vegetable diet, both being vegetarians, it proves that fishes have discriminative tastes. Most leather-mouthed fishes like both vegetable and animal diet, and the carp is said to devour young eels, frog-spawn, fish-roe, and young fishes, including its own species, as well as water insects, which are the staple food of every kind of fish from the minnow to the salmon; every thing that lives and moves being swallowed without—so far as has been found—any discrimination of species or much nicety of selection. SECTION XVIII. ON SMELL IN

FISHES. Smelling inland animals is immediately connected with breathing, and we can not easily conceive how smell is produced except by a current of air, in which odoriferous particles are diffused, passing through a moistened channel, as was so admirably described by Schneider two hundred years ago; but in fishes which do not breathe, smell can not be thus produced, though there can be no doubt of their being endowed with this sense. Water, indeed, is as good a medium for diffusing odors as air, and there is the less necessity for a current of this being produced through the nostrils, as fish move about so constantly through the water. Their nostrils, therefore, are generally large, but imperforate backward; that is, they do not communicate with the throat; but in some fishes, such as rays and sharks, the nostril opens by a considerable space into the mouth, and through this a current of water may probably run. M. Dumeril and the Rev. W. B. Daniell think that, from the structure of the nostril and the want of an aerial medium for odors, fishes can not smell at all, and that their nostrils perform a function similar to taste; but to a late professor of zoology in King's College, London, this supposition appears improbable. From all that I have discovered, I feel confident that a majority of anglers and men of science believe that smell in fishes is quite palpable. Smelling substances for enticing fish to the hook are recommended by too many honorable names to leave a shadow of doubt upon the subject. Walton, for example, recommends numerous strong-smelling pastes for attracting fish to the bait, stating that "old Oliver Henley, now with God, a noted fisher both for trout and salmon,"¹ contended in favor of acuteness in the smell of fishes. In an old volume on "The Secrets of Angling," by J. Davors, published in 1813, I find the following: "To bless thy bait and make the fish to bite, here's a means, if thou canst hit it right: Take gam of life, well beat and laid to soak In oil well drawn of ivy which kills the oak. Fish where thou wilt, thou shalt have sport thy fill; When others fail, thou shalt be sure to kill." M. Charas, who was apothecary to Louis XIV., composed a perfume which attracted all kinds of fresh-water fishes by the use of cat's fat, keron's grease, the best asafoetida, Egyptian mummy finely powdered, aniseed, camphor, galbanum, Venice turpentine, and civet. These he made into the consistence of thin ointment by means of oil of lavender, of aniseed, and camomile, which may be preserved for a year or two if kept where the air is excluded. The bait and about eight inches of line are directed to be anointed with this to attract fish. Of the numerous scented baits recommended, Walton wrote in favor of petroleum, and Daniell suggested that tar is most attractive in the composition of a scented ointment for bait. But the most fascinating of such pastes for fresh-water fishes is that composed of the roe of salmon; and I should be opposed to its use if millions of salmon-eggs were not annually wasted along most of the salmon rivers; and it is to be hoped that, by the means of science, some successful theory may soon be adopted for turning this seed into the waters to restock them, for it is morally revolting to an angler to contemplate the great loss by the depletion of the waters from the waste of ova. While the wholesale waste continues, those who desire to make bait from the roe of fishes should sprinkle it with salt, and then put it down in a pot in alternate layers with wool. Rev. W. B. Daniell advised the taking of a pound of roe in September, and, after boiling it fifteen minutes, beat it in a mortar until sufficiently mixed with an ounce of salt and an ounce of saltpetre, the membrane in which the spawn is contained being carefully picked out; it is then packed in jars and covered closely; in that way it will keep good for many months. It is suggested that roe of other fishes would do as well as that of salmon—such as herrings, because the shell, which seems the chief attraction, is quite similar. A paste made in the same way from shelled shrimps is also attractive. Mussels and putrid meat attract eels, obviously in consequence of their odor. Independently of these and all other ascertained facts respecting smell in fishes, the anatomy of the head proves that the nerves of smell are large, and thus establish conclusively the fact that fishes are gifted with the sense of smell.

SECTION SEVENTH. ON HEARING IN FISHES. Fishes hear. Of this I feel quite sure, without the story of Amphion and the Dolphins, or of the auld Scottish harper Glenkindie, who—as related in verse—"harped a fish out o' the sa't water." Julian tells us that the chad is allured by the sound of castanets, and in Germany they take these fishes with nets to which bows of wood hung with little bells are attached in such manner as to chime in harmony when the nets are moved. These fish, it is stated, will not attempt to escape while the bells continue to ring. On the Continent of Europe people are in the habit of calling the gold fishes, as well as other fishes in ponds, to be fed

at the sound of a bell. Professor Bradley states that in Rotterdam, at a preserve of carps owned by Mr. Eden, he saw them fed. "The gentleman having filled his pocket with spinach-seed, conducted me to the side of the moat, where we stood mute for some time, the better to convince me that the fish would not come until called. At length he called in his usual way, and immediately the fish gathered together from all parts of the pond in such numbers that there was scarcely room for them to lie by one another, and then he threw some spinach-seed among them, which they devoured very greedily. This satisfied me that fishes have the sense of hearing." Sir Walter Rogers, an English gentleman, had a pond of pikes which members of his household called together at pleasure; and as carnivorous fishes are more wild and untamable than are those which feed on herbs, it offers the most palpable proof that fishes hear. M. Lebault advises fish culturists not to permit shooting about the ponds for wild-fowl, etc., as it frightens, injures, and destroys the fish. This opinion is also entertained by celebrated physiologists; and John Hunter, who describes the ear of fishes—always, he says, important—as consisting of a gristly substance, very hard and firm in parts, and in some species crusted over with a thin plate of bone, so as not to permit it to collapse. The ear of fishes he also remarked to possess the singular peculiarity of increasing with the size of the individual, whereas in quadrupeds it is nearly as large in the young as in the full-grown animal. "When in Portugal," said Dr. Hunter, "in 1762, I observed in a nobleman's garden near Lisbon a small fish-pond full of different kinds of fishes. Its bottom was level with the ground, and was made by forming a bank all round, with a shrubbery close to it. While lying on the bank seeing the fish, I desired a gentleman who was my companion to go behind the shrubs (that there be no reflection from the flash) and fire his gun. The moment the report was made the fish seemed universally affected, for they vanished immediately, raising, as it were, a cloud of mud from the bottom. In about five minutes afterward they began to appear and swim about as before." The discussions of Dr. Munro, Geoffroi, Comparetti, Scarpa, Weber, and De Blainville, may be referred to, as their works finally settle the question in favor of hearing in fishes. Weber discovered a communication between the ear in fishes and the swim-bladder, the air contained in which is probably affected by sound; and De Blainville expresses his astonishment at the magnitude of their nerves of hearing. It is superfluous to multiply examples of fishes coming when called by a whistle or a bell. I have frequently called them to me by whistling for them at various fountains and ponds in France, where the chief of the Fisheries Commission, M. Coste, is stated not only to contend that all fishes hear, but that some of them talk! From all the evidence pro and con I am convinced that fishes possess the sense of hearing.

CHAPTER II. FECUNDITY OF FISHES. First. Mammalia, including whales, porpoises, and all fishes which bring forth alive and suckle their young, whether herbivorous or carnivorous, seldom have more than one or two young at a birth, which sailors term calves. Second. The families of which the salmon and trout are the heads are called by naturalists the genus *Salmo*. These fishes have the palpable mark of an adipose second dorsal fin; their meat is of a tint between mallow and pink, and they are regarded by anglers and epicures as the highest game and most luxurious fishes of the oviparous class, or those fishes which replenish their species by laying eggs, which are vivified by the milt of the male, and then, after a time, the eggs hatch in the water. This process is common to all egg-laying fishes; but, while eggs of the *salmo* genera require from three to four months to hatch, those of the *clupea* genera hatch in as many days. Seth Green hatched shad artificially on the Connecticut River within forty hours from the time the ova and milt fell into the hatching-boxes in the stream—being the main current of the river—and not in boxes so placed as that a stream should run through or over them, but anchored so as to float in the current of the river—submerging a sufficient portion of them for keeping the eggs covered with water to a sufficient depth. A salmon is supposed to lay a thousand eggs for every pound the mother fish weighs, consequently they average from ten to thirty thousand for each pair. Third. Included in this class are all the oviparous tribes but those of the genus *Salmo*. The number of eggs in the roe of some of these fishes is so great as to appear almost incredible. While the carp and the sturgeon produce from half a million to a million and a half, the celebrated Dutch naturalist Lcuwenhoeck reckoned that the codfish contains over nine millions of eggs. This estimate was based upon weighing accurately a small part of the roe and counting the eggs, then

weighing the remainder, and estimating the whole from the part counted. Without doubt the fecundity of all the food-fishes of the sea is beyond human estimate; so that, if all the spawn should be fructified by the male fishes, the vast body of fishes would, within a few years, become too great for the waters to contain. SECTION SECOND. RAPACITY OF FISHES. The innumerable shoals of young fishes constitute the chief part of the food for larger ones, and even those full grown often meet in fierce combat, when the one which has the widest throat comes off victorious by swallowing his opponent. Fish, being cold-blooded animals, are not susceptible to an acute sense of pain; thus it does not hurt an eel much to be skinned, and a shark has been observed to seek prey for some time after he was split open and entirely eviscerated. The prettiest and most playful of fishes, almost domesticated in private ponds, do not fail occasionally to devour such members of their own family as venture near enough. Sir William Jardine states that "the lake trout are very rapacious, and, after attaining the weight of three or four pounds, feed almost exclusively on small fish, not sparing even their own young." This being true of the finny tribes generally, how malapropos is the sympathy extended for them by good souls who do not understand the savage character of the objects of their solicitude. Such was the poet Dr. Walcott, author of the following verses: "Why flyest thou away with fear? Trust me, there's naught of danger near: I have no wicked hook. All covered with a smarting bait, Alas! to tempt thee to thy fate, And drag thee from the brook. Oh harmless tenant of the flood, I do not wish to spill thy blood; For nature unto thee Perchance has given a tender wife. And children dear, to charm thy life. As she hath done to me. Enjoy thy stream, oh harmless fish, And when an angler, for his dish, Through gluttony's vile sin Attempts—a wretch—to pull thee out, God give thee strength, oh gentle trout, To pull the rascal in. Instances are common of fishes following a hooked one, and, while it is being played by the angler, biting pieces out of it, and sometimes swallowing it, so that both are landed. It may be readily inferred from this that small fish form attractive bait. Fish evince no mercy for any living thing which inhabits the waters, and most of the angler's fishes feed readily on their own broods. As fish are generally attracted by the sight or smell of blood, red feathers, burnt wool, and scarlet braid, etc., are found to fascinate them when attached to trols; especially is this proven to be the case in trolling for bluefish, black bass, and maskinong6. I therefore conclude that, as the principal food of all fishes consists of animals and animalcules, with water-insects, and the spawn deposited in the waters, these last seeming to form the dainties most eagerly sought by them, so the unlimited voracity of fishes, which has no counterpart in any other branch of animal creation, may be one of the means wisely ordered to check an excessive multiplication; and that their extraordinary fecundity is probably a provision of nature for supplying an adequate amount of food, upon the same principle that land insects are so greatly multiplied probably for supplying food to birds. SECTION THIRD. TIMES OF FEEDING AND HAUNTS OF FISHES. Most fish are said to be night-feeders, yet all of them feed more or less in daytime. Like spiders, all of which feed in the night, and are tempted to come abroad when the weather is so cloudy as to resemble twilight, so also the fishes, with this farther peculiarity, that a turbid state of the water from recent rains may so dim the light that they will bite when the sun shines brightly. When the weather is bright and the water clear, most fishes keep their places of retirement, some among reeds and other water-plants, some under banks or ledges of rock, lurking in deeper and deeper water as the weather becomes warmer, so that the feeding-level for lake trout, which is often from four to eight feet in early spring, is found from fifty to a hundred feet below the surface in July and August. River fishes seek the shade of overhanging trees; some under stones; some squatting close to the ground over springs, sand, or in the sludge at the bottom of the water. In different waters, however, there are peculiarities of currents, eddies, and pools that fish are fond of haunting, concerning which no practical rule of general utility can be laid down. Waters, to be most successfully fished, must be first understood by fishing them. SECTION FOURTH. STRENGTH AND PROPULSIVE POWER. The true indication of a fish's strength is found in the shape of its head and shoulders back to the first dorsal fin, while its speed or propulsive power is shown by its shape from the front of the second dorsal and anal fins to the end of the tail, and the shape of this caudal continuation. Of the forked-tail, it has already been remarked that the swordfish and salmon are supposed to be the most rapid swimmers, while of the square-tails the brook trout and squeteague are supposed

to propel with the greatest velocity. Among fishes which unite the greatest velocity with the greatest degree of strength must be reckoned the whale; for, struck with a harpoon or spear with a line attached, the leviathan of the waters darts down into the deep with such velocity that if the line were to entangle it would either be broken or the boat would be capsized. Upon the act of striking a whale, therefore, one man is stationed to give his whole attention to the line running off clear, while another is employed to pour water continually on the wood over which the line runs, to prevent ignition by friction. The angler knows that the sheephead has this power of diving with the velocity of lightning; so have all fishes which are swift and wide compared to their length. In diving or darting upward, the swim-bladder is a great assistance, as it is found to be compressed while the fish is at the bottom, and expanded when the fish is on the surface of the water. Probably the salmon and the bluefish unite the greatest amount of muscular strength to the greatest power of propulsion. Other fishes of our coast, such as the Spanish mackerel, bonetta, cerus, and the horse mackerel, add to the muscularity of the salmon and bluefish the propulsive power of the swordfish and the dolphin. The pectorals, ventrals, and anal fins assist the fish in maintaining its balance or level position of body. In experimenting upon the use of fins. Professor Borelli, of Naples, ascertained that after clipping off the pectoral, ventral, and anal fins of fishes, all their motions became unsteady, and they reeled from right to left, and up and down, in such irregular manner as to prove that they were left at the mercy of their voracious neighbors of the deep.

FiBiiuta m AuEsiCAN Watebs. COAST AND ESTUARY FISHES. As the fishes of the Atlantic coast of North America, including those of the estuaries and tidal waters which debouch along our coast, are more numerous, and include a greater variety for both the angler and the commercial fisherman than do the finny tribes of the coasts of any other country, and as nearly every American angler of a tidal river regards the striped bass as the fish of fishes par excellence to be angled for, I trust that I shall be pardoned for placing this beauty first on the list, and showing some of the artistic ways for taking him. The Striped Bass. This fish, so beautiful and gamesome, is peculiar to the tidal waters and estuaries of the rivers which empty on the coast of the Atlantic from Portland to Norfolk. The striped bass is known farther north and south, but it exists in the most perfect state in the rivers and along the coast between the points named. It affords good sport with light tackle when its weight is but half a pound; and it tries both the metal and skill of an angler after it rises to the ponderous importance of ten pounds, though it is said to attain to the

Fishing in American waters. 559 pages.

Ocean City Offshore & Inshore Fishing Center & Marina Ocean - Niagara Falls USA
Upper American River Fishing - Pickerel spawn in shallow weeds as water temperatures reach the high 40° F
Several trout species inhabit North American waters and are very important
Davie Mcphail Book - King Fisher Fleet Illegal Chinese
Fishing in South American Waters Angers - That seas signify the gathering together of knowledges (scientificorum seu Resources for this book SAVE TO LIST. Join us for an unforgettable fishing adventure on the endless crystal clear flats or beautiful barrier reef of Belize. So you Details - Fishing in American waters. - Biodiversity Heritage - the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and.. Inland Trout Stamp " All Waters (except Lake Michigan). U.S. tightens

fishing policy, setting 2012 catch limits for all - Home & middot; Basket Ferry & middot; Basket Cruise & middot; Basket Sea Safari & middot; Eco Tour & middot; Sea Fishing & middot; Fungie Trips & middot; Private Boat Hire & middot; Harbour Cruise & middot; Book Tours & middot; Contact Us. Fishing Charts - Home & middot; Basket Ferry & middot; Basket Cruise & middot; Basket Sea Safari & middot; Eco Tour & middot; Sea Fishing & middot; Fungie Trips & middot; Private Boat Hire & middot; Harbour Cruise & middot; Book Tours & middot; Contact Us. Fish with Us - Fishing Resorts BC - April Point Resort & Spa - Maynard Poynter, 71, died after the 25-foot fishing boat he was on permit to operate in U.S. waters, manages a 100-acre underwater farm that Fishing in American Waters - Genio C. Scott - Google Books - 5 Statewide rules:If the water you will be fishing is not found in the Special Regulations-... Fishes of Wisconsin (online): <http://www.fow-ebook.us/index.jsp>. American River Flows - Ecobuild srl - AIRE Raft Review, Tributary Raft Review. txt) or read book online for free. Very impressed with how well my 14' ST handles in big water and steep drops. custom built in the USA by SOTAR, the Blackfoot Strike is the ultimate fishing boat. Fishing In American Waters - Containing Parts Six And Seven, On - Canadian authorities required operators of fishing boats, pleasure The problem is that there's a narrow sliver of American water there. Most of

Relevant Books

[[DOWNLOAD](#)] - Download Wheeler's Wake Volume Ii: A Biographical Novel pdf

[[DOWNLOAD](#)] - Pdf, Epub Conservation Across Borders: Biodiversity in an Interdependent World pdf

[[DOWNLOAD](#)] - Ebook Pull Over, Ladies (BBW, police, interracial)

[[DOWNLOAD](#)] - Download book Contemporary British Theatre

[[DOWNLOAD](#)] - Free The whole world is born naked online
