

INDEX

Fishery Bulletin Vol. 70, Nos. 1-4, 1972

- Abalone—see White abalone
- ABRAMSON, NORMAN J., and PATRICK K. TOMLINSON, "An application of yield models to a California ocean shrimp population" 1021
- Abudefduf abdominalis*—see Damsel fish
- "Abundance, distribution, movements, and lengths of larval herring along the western coast of the Gulf of Maine," by Joseph J. Graham, Stanley B. Chenoweth, and Clarence W. Davis 307
- Acanthurus achilles*—see Surgeonfish
- Acanthurus dussumieri*—see Surgeonfish
- Acanthurus leucopareus*—see Surgeonfish
- Acanthurus nigrofuscus*—see Surgeonfish
- Acanthurus nigroris*—see Surgeonfish
- "Activity and feeding behavior of the summer flounder (*Paralichthys dentatus* L.) under controlled laboratory conditions," by Bori L. Olla, Carol E. Samet, and Anne L. Studholme 1127
- "Activity of Hawaiian reef fishes during the evening and morning transitions between daylight and darkness," by Edmund S. Hobson 715
- Actuariolum bicaudatum*—see Moridae
- Actuariolum terakohensis*—see Moridae
- ADAMS, CLAYTON A.—see CARR and ADAMS
- Aequipecten irradians*—see Bay scallop
- Aerial spotters
survey of fish abundance off southern and central California 1005
- AHLSTROM, ELBERT H., "Kinds and abundance of fish larvae in the eastern tropical Pacific on the second multivessel EASTROPAC survey, and observations on the annual cycle of larval abundance" 1153
- , —see MATSUMOTO et al.
- , —see MOSER and AHLSTROM
- Akademik Kurchatov*—see Vessels
- Alaminos*—see Vessels
- Alaska*—see Vessels
- Alaska
Bristol Bay 143
Brooks Lake
sockeye salmon 447
Cook Inlet 143
Copper River 143
Iliamna Lake 355
Karluk River 79
Kodiak Island 79
- Alaska pink shrimp
determining carotenoid content 111
- Albacore
larvae, identification 4
- Albatross*—see Vessels
- Albatross III*—see Vessels
- Albatross IV*—see Vessels
- Albulidae—see Bonefishes
- Alewife
New York 583
- Algae—see Phytoplankton
- Alona affinis*—see Zooplankton
- Alosa pseudoharengus*—see Alewife
- Alosa sapidissima*—see American shad
- Alpha Helix*—see Vessels
- ALVARINO, A., "A second record of a rare siphonophore *Epibulia ritteriana* Haeckel 1888" 507
- Amblyopsidae—see Cavefishes
- American oyster
comparison of allometric relationships in intertidal and subtidal
dry body weight/height 1124
dry body weight/length 1124
dry body weight/soft body weight 1123
dry body weight/whole weight 1123
height/soft body weight 1124
shell weight/dry body weight 1123

American oyster—Cont.		“(An) application of yield models to a California ocean shrimp population,” by Norman J. Abramson and Patrick K. Tomlinson	1021
New York	580, 584		
American plaice		<i>Argo</i> —see Vessels	
distribution, Nova Scotia to Long Island	639	Ariidae—see Sea catfishes	
American shad		<i>Artemia</i>	
migration		as food for Pacific mackerel	973
juveniles	664	Atherinidae—see Silversides	
ocean temperature	664, 666	Atlantic coast	
river temperature	660	Scorpaenidae	404
New York	586	Atlantic cod	
Ammonia		New York	580, 590
fish excretions as source in the sea	399	Atlantic herring	
“(The) amount of space available for marine and freshwater fishes,” by Michael H. Horn	1295	abundance, distribution, movements, and lengths of larvae along the western coast	
Anchovies		of the Gulf of Maine	307
of Georgia coast	336	New York	583
Anchovy—see Northern anchovy		retention of larvae within the Sheepscot estuary of Maine	299
Anchovy		Atlantic mackerel	
larval		New York	592
sampling with a plankton purse seine	789	Atlantic menhaden	
selectivity of towed-net samplers	808	groupings, variations in	
nitrogen excretion		length composition	699, 700
<i>Engraulis mordax</i>	395	size	699
<i>Engraulis ringens</i>	395	internal tags	514
ANDREWS, JAMES W.—see MURAI and ANDREWS		New York	580
———, —see SICK et al.		seasonal groupings	700
Anguillidae—see Freshwater eels		summer schools	
<i>Anne M.</i> —see Vessels		number of fish, in relation to length	708
Antarctic seas		size of, in relation to abundance	709
assimilation rates of phytoplankton	1077	size of, in relation to length	707
growth rate of phytoplankton	1069	young, description of	115
Antennariidae—see Frogfishes		Atlantic Ocean	
<i>Antimora microlepis</i> —see Moridae		blue marlin	283
Aphredoderidae—see Pirate perches		temperature and shad migration	664
<i>Apogon menesemus</i> —see Cardinalfish		white marlin	283
<i>Apogon snyderi</i> —see Cardinalfish		<i>Auchenoceros punctatus</i> —see Moridae	
“Apparent abundance of some pelagic marine fishes off the southern and central California coast as surveyed by an airborne monitoring program,” by James L. Squire, Jr.	1005	Baja California	
		Cabo San Lucas	62
		Cedros Island	62
		Magdalena Bay	62
		models of migration of young skipjack tuna	751

BANSE, KARL, "Redescription of some species of <i>Chone</i> Kröyer and <i>Euchone</i> Malmgren, and three new species (Sabellidae, Polychaeta)"	459	body shape	1246
Barataria Bay, Louisiana	1284	development of meristic characters	1249
BARKER, LLOYD W.—see FITCH and BARKER		pigment patterns	1252
BARKLEY, RICHARD A., "Selectivity of towed-net samplers"	799	larval occurrences	
BARRACLOUGH, W. E., and D. ROBINSON, "The fertilization of Great Central Lake. III. Effect on juvenile sockeye salmon"	37	north of Cape Lookout, North Carolina, in 1966	1254
Barracuda—see Pacific barracuda		New York	581, 593
Barracudas		Black skipjack tuna	
of Georgia coast	346	larvae, identification	3
Bass—see Black sea bass		Blackfin tuna	
<i>Bathylagus stibbius</i>		larvae, identification	9
selectivity of towed-net samplers	813	Blenniidae—see Combtooth blennies	
Batrachoididae—see Toadfishes		Blennies	
BAUERSFELD, PAUL E., JR., and JOSEPH H. SOARES, JR., "Fish solubles as a partial substitute for milk and milk by-products in liquid rations for neonatal animals"	1275	Hawaiian reefs	722
Bay scallop		Blue crab	
New York	581, 588	New York	585
BEARDSLEY, GRANT L., JR.—see MATHER et al.		Blue marlin	
"Behavior of bluefin tuna schools in the eastern North Pacific Ocean as inferred from fishermen's logbooks, 1960-67," by Michael J. Scott and Glenn A. Flittner	915	Atlantic	
Belonidae—see Needlefishes		migration and distribution	283
BENNETT, HARRY J.—see CONDREY et al.		Blue shark	
Bering Sea		deep-sea observations	510
king crab	225	growth hormone- and prolactin-like proteins	
Bigeye tuna		amino acid composition	937
environmental influence over distribution	880	electrophoretic analyses	935
larvae, identification	8	immunodiffusion	937
Bigeyes		molecular weights	936
Hawaiian reefs	724	peptide maps	937
Black sea bass		purification	936
description of larvae		Bluefin tuna	
armature	1246	eastern North Pacific Ocean	
		geographical variation in schooling behavior	917
		multiple schooling characteristics	925
		occurrence of schools in relation to time	
		of day	922
		schooling behavior	916
		vulnerability to capture	919
		larvae, identification	8
		Bluefish	
		New York	580, 587
		of Georgia coast	340
		Bogue Inlet, North Carolina	115
		Bonefishes	
		of Georgia coast	334
		Bonito—see Pacific bonito	
		BOOTH, DOUGLAS E., "A model for optimal salmon management"	497

- Boothbay depressor trawls
filtration efficiencies 518
- Bosmina coregoni*—see Zooplankton
- Bothidae—see Lefteye flounders
- BRADLEY, ROBERT P.—see DAVIES and
BRADLEY
- Brevoortia tyrannus*—see Atlantic menhaden
- Bristol Bay, Alaska 143
- British Columbia, Canada 143
- Brooks Lake, Alaska
study stream for sockeye salmon 447
- Brown shrimp
nutritional requirements for culture 104, 106
organics and organic moieties
feeding efficiency of 1287
minimum net assimilation rates of 1287
net assimilation efficiency of 1286
- Butterfish
distribution, Nova Scotia to Long Island 641
New York 581, 590
of Georgia coast 347
- Butterflyfish
Hawaiian reefs 722
- Cabo Stn Lucas, Baja California 62
- CAHN, PHYLLIS H., "Sensory factors in the
side-to-side spacing and positional orientation
of the tuna, *Euthynnus affinis*, during schooling" . 197
- Calanoids—see *Sergestes similis*
- California
application of yield models to ocean shrimp
population 1021
La Jolla 1262
Point Conception 62
Point Loma 205
San Diego 62
San Francisco Bay 1138
- California coast
sea level differences between, and Hawaiian
Islands 619
- California Current Extension
skipjack tuna and their physical environment . 766
- Callinectes sapidus*—see Blue crab
- Canada
British Columbia 143
Great Central Lake 13, 25, 37
Hudson Bay 61
- Cantherines dumerili*—see Filefish
- Cantherines sandwichiensis*—see Filefish
- Cape Lookout, North Carolina 1244
- Carangidae—see Jacks; Pompanos
- Cardinalfish
Hawaiian reefs 722
- CARLSON, FRANK T., and JOHN W.
REINTJES, "Suitability of internal tags for
Atlantic menhaden" 514
- Carotenoid content
Alaska pink shrimp 111
- Carol Virginia*—see Vessels
- Carp
of Georgia coast 336
- CARR, WILLIAM E. S., and CLAYTON A.
ADAMS, "Food habits of juvenile marine
fishes: evidence of the cleaning habit in the
leatherjacket, *Oligoplites saurus*, and the spot-
tail pinfish, *Diplodus holbrooki*" 1111
- Catfishes—see Freshwater catfishes; Sea catfishes
- Catostomidae—see Suckers
- Cavefishes
of Georgia coast 337
- Cedros Island, Baja California 62
- Central Pacific Ocean
pre-exploitation abundance of tunas 875
- Centrarchidae—see Sunfishes
- Centropomidae—see Snooks
- Centropristis striata*—see Black sea bass
- Centropyge potteri*—see Butterflyfish
- Cetaceans
small, methods for tagging 61

<i>Chaetoceros atlanticus</i> —see Diatoms	
<i>Chaetodon auriga</i> —see Butterflyfish	
<i>Chaetodon multicinctus</i> —see Butterflyfish	
<i>Chaetodon ornatissimus</i> —see Butterflyfish	
<i>Chaetodon unimaculatus</i> —see Butterflyfish	
Chaetognaths—see <i>Sergestes similis</i>	
Challenger—see Vessels	
CHENOWETH, STANLEY B.—see GRAHAM et al.	
CHESS, JAMES R.—see ROSENTHAL and CHESS	
Chinook salmon	
fall yield of Columbia River hatcheries	431
juvenile	
growth in water of differing salinity	119
passage over Rock Island Dam	
distribution by ladder	132, 137
percentage tagged fish observed	131, 137
travel time over ladders	132, 138
tagging	130
<i>Chlamydomonas mundana</i> —see Phytoplankton	
<i>Chlorella pyrenoidosa</i> —see Phytoplankton	
<i>Chone albocincta</i> —see Polychaetes, sabellid	
<i>Chone eniwetokensis</i> —see Polychaetes, sabellid	
<i>Chone valeronis</i> —see Polychaetes, sabellid	
<i>Chromis leucurus</i> —see Damselfish	
<i>Chromis ovalis</i> —see Damselfish	
<i>Chromis vanderbilti</i> —see Damselfish	
<i>Chromis verater</i> —see Damselfish	
<i>Chroococcus</i> —see Phytoplankton	
<i>Cirrhitops fasciatus</i> —see Hawkfish	
<i>Cirripectus variolosus</i> —see Blennies	
Cleaning	
leatherjacket	1113
spottail pinfish	1114
Clingfishes	
of Georgia coast	338
<i>Clupea harengus</i> —see Atlantic herring	
Clupeidae—see Herrings	
CLUTTER, ROBERT I.—see MURPHY and CLUTTER	
Coastal habitats of fish	
diversity	349
Codfishes	
of Georgia coast	338
Coho salmon	
characteristics	
age	80
egg size	86
fecundity	82
length	84
smolts	
age	89
migration	87
size	90
“Color patterns of spinner porpoises (<i>Stenella</i> cf. <i>S. longirostris</i>) of the eastern Pacific and Hawaii, with comments on delphinid pigmentation,” by William F. Perrin	983
COLTON, JOHN B., JR., “Temperature trends and the distribution of groundfish in continental shelf waters, Nova Scotia to Long Island”	637
Columbia River hatcheries	
fall chinook salmon	431
Columbia River, Washington	125, 660
Combtooth biennies	
of Georgia coast	346
“Comparative study of food of skipjack and yellowfin tunas off the coast of West Africa,” by Alexander Dragovich and Thomas Potthoff	1087
“Comparison of foregut contents of <i>Sergestes similis</i> obtained from net collections and albacore stomach,” by David C. Judkins and Abraham Fleminger	217
“Comparison of the assimilation of different diets by <i>Penaeus setiferus</i> and <i>P. aztecus</i> ,” by Richard E. Condrey, James G. Gosselink, and Harry J. Bennett	1281
“Comparison of various allometric relationships in intertidal and subtidal American oysters,” by Richard F. Dame	1121

CONDREY, RICHARD E., JAMES G. GOSSELINK, and HARRY J. BENNETT, "Comparison of the assimilation of different diets by <i>Penaeus setiferus</i> and <i>P. aztecus</i> "	1281
Connecticut	
Connecticut River	662
Connecticut River, Connecticut	662
<i>Connie Jean</i> —see Vessels	
<i>Conochilus unicornis</i> —see Zooplankton	
<i>Conquest</i> —see Vessels	
"Consideration of three proposed models of the migration of young skipjack tuna (<i>Katsuwonus pelamis</i>) into the eastern Pacific Ocean," by F. Williams	741
<i>Conte Bianco</i> —see Vessels	
Continental shelf	
Nova Scotia to Long Island distribution of groundfish	637
temperature trends	637
Cook Inlet, Alaska	143
Copper River, Alaska	143
Crab—see Fiddler crab; King crab	
Crab fisheries	
Japanese development of	239
United States-Japan-Soviet regulations on North Pacific king crab	251
<i>Crassostrea virginica</i> —see American oyster	
<i>Townsend Cromwell</i> —see Vessels	
Crystal River, Florida	1111
<i>Ctenochaetus strigosus</i> —see Surgeonfish	
Cusk-eels	
of Georgia coast	338
Cutlassfishes	
of Georgia coast	346
"Cycling of elements in estuaries," by D. A. Wolfe and T. R. Rice	959
<i>Cyclops bicuspidatus thomasi</i> —see Zooplankton	
<i>Cyclops scutifer</i> —see Zooplankton	

<i>Cyclops vernalis</i> —see Zooplankton	
<i>Cyclotella</i> —see Phytoplankton	
Cynoglossidae—see Tonguefishes	
<i>Cynoscion regalis</i> —see Weakfish	
Cyprinidae—see Carps; Minnows	
Cyprinodontidae—see Killifishes	
Dab	
New York	594
<i>Dactyliosolen mediterraneus</i> —see Diatoms	
DAHLBERG, MICHAEL D., "An ecological study of Georgia coastal fishes"	323
DAME, RICHARD F., "Comparison of various allometric relationships in intertidal and subtidal American oysters"	1121
Damselfish	
Hawaiian reefs	717
<i>Dana</i> —see Vessels	
<i>Daphnia longiremis</i> —see Zooplankton	
<i>Daphnia pulex</i> —see Zooplankton	
<i>Dascyllus albisella</i> —see Damselfish	
DAVIES, ISAAC E., and ROBERT P. BRADLEY, "Deep observations of anchovy and blue sharks from <i>Deepstar 4000</i> "	510
DAVIS, CLARENCE W.—see GRAHAM et al.	
DAVY, BRENT, "A review of the lanternfish genus <i>Taaningichthys</i> (family Myctophidae) with the description of a new species"	67
<i>Decibar</i> —see Vessels	
"Deep observations of anchovy and blue sharks from <i>Deepstar 4000</i> ," by Isaac E. Davies and Robert P. Bradley	510
<i>Deepstar 4000</i> —see Vessels	
Delaware—see Vessels	
<i>Dendrochirus brachypterus</i> —see Scorpionfish	
<i>Denticula seminae</i> —see Diatoms	

<i>Dermasterias imbricata</i> —see Leather star	
“Description of black sea bass, <i>Centropristis striata</i> (Linnaeus), larvae and their occurrences north of Cape Lookout, North Carolina, in 1966,” by Arthur W. Kendall, Jr.	1243
“(A) description of young Atlantic menhaden, <i>Brevoortia tyrannus</i> , in the White Oak River estuary, North Carolina,” by Robert M. Lewis, E. Peter H. Wilkens, and Herbert R. Gordy	115
“Development and early life history of the northern sennet, <i>Sphyraena borealis</i> DeKay (Pisces: Sphyraenidae) reared in the laboratory,” by Edward D. Houde	185
“Développement and geographic distribution of the rockfish, <i>Sebastes macdonaldi</i> (Eigenmann and Beeson, 1893), family Scorpaenidae, off southern California and Baja California,” by H. Geoffrey Moser	941
“Development of the lanternfish, <i>Scopelopsis multipunctatus</i> Brauer 1906, with a discussion of its phylogenetic position in the family Myctophidae and its role in a proposed mechanism for the evolution of photophore patterns in lanternfishes,” by H. Geoffrey Moser and Elbert H. Ahlstrom	541
“Developmental rates at various temperatures of embryos of the northern lobster (<i>Homarus americanus</i> Milne-Edwards),” by Herbert C. Perkins	95
de VLAMING, VICTOR, “The effects of temperature and photoperiod on reproductive cycling in the estuarine gobiid fish, <i>Gillichthys mirabilis</i> ” .	1137
<i>Diaptomus gracilis</i> —see Zooplankton	
<i>Diaptomus kenai</i> —see Zooplankton	
<i>Diaptomus oregonensis</i> —see Zooplankton	
Diatoms	
small-scale distributions in the ocean	
<i>Chaetoceros atlanticus</i>	368
<i>Dactyliosolen mediterraneus</i>	368
<i>Denticula seminae</i>	363
<i>Hemiaulus hauckii</i>	363
<i>Nitzschia turgiduloides</i>	363
<i>Dinobryon</i> —see Phytoplankton	
<i>Diplodus holbrooki</i> —see Spottail pinfish	
<i>Discovery</i> —see Vessels	
Distant-water fisheries	
Japanese, a review	227
<i>Ditylum brightwellii</i> —see Phytoplankton	
Diurnal fish—see Hawaii	
<i>Dolphin</i> —see Vessels	
DRAGOVICH, ALEXANDER, and THOMAS POTTHOFF, “Comparative study of food of skipjack and yellowfin tunas off the coast of West Africa”	1087
DRUCKER, BENSON, “Some life history characteristics of coho salmon of the Karluk River system, Kodiak Island, Alaska”	79
Drums	
of Georgia coast	341
<i>Dunaliella tertiolecta</i> —see Phytoplankton	
Eastern Pacific Ocean	
skipjack tuna migration models	741
Eastern tropical Pacific Ocean	
growth rate of phytoplankton	1071
tagging <i>Stenella</i> spp.	61
EASTROPAC II survey	
comments on larvae of major fish families collected	1172
comparison with EASTROPAC monitoring cruises	1162
kinds and abundance of fish larvae	
comparison between monitoring pattern and larger EASTROPAC pattern	1166
comparison of EASTROPAC II and EASTROPAC I collections	1164
comparison with <i>Oceanographer</i> zig-transect	1170
effectiveness of sampling in daylight versus night hauls	1156
kinds	1162
number	1161
review of papers on adult fishes	1160
water temperature	1158
Echeneidae—see Remoras	
<i>Eclipses extensus</i> —see Moridae	
<i>Eclipses manni</i> —see Moridae	
<i>Eclipses santamonicae</i> —see Moridae	
<i>Eclipses veternus</i> —see Moridae	

"(An) ecological study of Georgia coastal fishes," by Michael D. Dahlberg	323	solar energy	966
		wind	966
		rainfall runoff determinant of elements in	965
Education—see Fishery scientists			
Eels—see Freshwater eels; Snake eels		Estuarine species	
		life cycles	348
"Effect of crowding on relation between exploitation and yield in <i>Tilapia macrocephala</i> ," by Ralph P. Silliman	693	<i>Euchone velifera</i> —see Polychaetes, sabellid	
		Euphausiids—see <i>Sergestēs similis</i>	
"Effect of encroachment of Wanapum Dam Reservoir on fish passage over Rock Island Dam, Columbia River," by Richard L. Major and Gerald J. Paulik	125	<i>Euthynnus affinis</i> —see Kawakawa	
		<i>Euthynnus lineatus</i> —see Black skipjack tuna	
"(The) effects of temperature and photoperiod on reproductive cycling in the estuarine gobiid fish, <i>Gillichthys mirabilis</i> ," by Victor L. de Vlaming	1137	EVANS, W. E., J. D. HALL, A. B. IRVINE, and J. S. LEATHERWOOD, "Methods for tagging small cetaceans"	61
		<i>Exallias brevis</i> —see Blennies	
"Electrophoretic investigation of the family Scorpaenidae," by Allyn G. Johnson, Fred M. Utter, and Harold O. Hodgins	403	"Exploitation effects upon interspecific relationships in marine ecosystems," by Saul B. Saila and James D. Parrish	383
Eleotridae—see Sleepers		"(An) exposition on the definition of fishing effort," by Brian J. Rothschild	671
Elopidae—see Tarpons			
<i>Eltanin</i> —see Vessels		Fall chinook salmon—see Chinook salmon	
<i>Engraulis mordax</i> —see Northern anchovy		"(The) fertilization of Great Central Lake. I. Effect of primary production," by T. R. Parsons, K. Stephens, and M. Takahashi	13
<i>Engraulis ringens</i> —see Anchovy		"(The) fertilization of Great Central Lake. II. Zooplankton standing stock," by R. J. LeBrasseur and O. D. Kennedy	25
Ephippidae—see Spadefishes		"(The) fertilization of Great Central Lake. III. Effect on juvenile sockeye salmon," by W. E. Barraclough and D. Robinson	37
<i>Epischura nevadensis</i> —see Zooplankton		Fertilization	
EPPLEY, RICHARD W., "Temperature and phytoplankton growth in the sea"	1063	Great Central Lake	
		effect of primary production	13
<i>Erytemora yukonensis</i> —see Zooplankton		effect of juvenile sockeye salmon	37
		zooplankton standing stock	25
"Escape behavior of the Hawaiian spinner porpoise (<i>Stenella cf. S. longirostris</i>)," by William F. Perrin and John R. Hunter	49	Fiddler crab	
<i>Esox</i> sp.—see Pikes		adult	
Estuarine ecosystems		survival and metabolism	415
biota important in cycling of metallic elements	962	Filefish	
chemical and physical properties of metals contained in	960	Hawaiian reefs	720
contaminant metals contained in	959		
major reservoirs in the cycling of elements ...	961	"Filtration efficiencies of Boothbay depressor trawls," by Joseph J. Graham	518
nondynamic state variables			
salinity	966		

Fish	
juvenile	
analysis of stomach contents	1112
efficacy of sieve fractionation procedure	1116
pelagic marine, off southern and central California	
average weight of fish schools	1012
distribution of flight observation effort	1010
index of annual apparent abundance	1012
nocturnal and diurnal variation in number of sightings and tonnage	1010
processing of observation data	1007
“(The) fish family Moridae in the eastern North Pacific with notes on morid otoliths, caudal skeletons, and the fossil record,” by John E. Fitch and Lloyd W. Barker	559
Fish larvae	
anchovy sampling with plankton purse seine	789
eastern tropical Pacific	
Anguilliformes	1194
Apogonidae	1198
Argentinidae	1175
Astronesthidae	1181
Bathylagidae	1175
Bothidae	1202
Bregmacerotidae	1196
Carangidae	1198
Chauliodontidae	1181
Clupeidae	1174
Coryphaenidae	1198
Cynoglossidae	1204
Engraulidae	1174
Evermannellidae	1183
Gempylidae	1200
Gobiidae	1200
Gonostomatidae	1177
Idiacanthidae	1182
Lophiiformes	1204
Melamphaidae	1196
Myctophidae	1184
Nomeidae	1200
Ophidiidae	1201
other identified	1207
other Stomiatoidei	1182
Paralepididae	1193
Scomberesocidae	1196
Scombridae	1201
Scopelarchidae	1193
Scopelosauridae	1193
Sternoptychidae	1181
Synodontidae	1194
Trachichthyidae	1196
Trichiuridae	1201
skipjack tuna	770
natal animals,” by Paul E. Bauersfeld, Jr., and Joseph H. Soares, Jr.	1275
Fish solubles	
partial substitute for milk and milk by-products in liquid rations	
criteria for proteins in milk replacers	1276
feasibility	1277
Fisheries	
uses of concentration indices	511
Fisheries, Japanese development of	
anchovy, sardine, jack mackerel, yellow tail, common squid	243
crab	239
post-war expansion	245
salmon	238
trawl	229
tuna	241
Fishery courses—see Fishery scientists	
Fishery scientists	
choice of college degree	682
compare usefulness of subjects	685
group comparisons	687
opinions of fishery curricula	684
undergraduate education	681
Fishery trade associations in Japan	265
Fishing effort	
decision criteria	678
definition	671
input-output analysis	673
interpretation of fishing skill	676
FITCH, JOHN E., and LLOYD W. BARKER, “The fish family Moridae in the eastern North Pacific with notes on morid otoliths, caudal skeletons, and the fossil record”	559
FLEMINGER, ABRAHAM—see JUDKINS and FLEMINGER	
FLITTNER, GLENN A.—see SCOTT and FLITTNER	
Florida	
Crystal River	1111
Miami Beach	186
St. Johns River	660
Sarasota	63
Flounders—see Lefteye flounder; Summer flounder	
FONTAINE, C. T., S. E. P. GISLASON, and W. L. TRENT, “A system for collecting large numbers of live postlarval penaeid shrimp”	1298

"Food habits of juvenile marine fishes: evidence of the cleaning habit in the leatherjacket, <i>Oligoplites saurus</i> , and the spottail pinfish, <i>Diplodus holbrooki</i> ," by William E. S. Carr and Clayton A. Adams	1111	gars	334
Food web		gobies	334
unstructured marine		grunts	341
calculation of the coefficients of the predaceous food web	1056	herrings	335
concentration factors	1057	jacks	340
development of matrix and equations	1053	killifishes	338
further variations of the matrix analysis	1055	Kyphosidae	345
mullet anomaly	1057	lefteye flounders	347
pelagic versus shallow water populations	1057	livebearers	339
Fossils—see Moridae		lizardfishes	336
Freshwater catfishes		mackerels	347
of Georgia coast	337	minnows	336
Freshwater eels		mojarras	340
of Georgia coast	335	mudminnows	336
Frogfishes		mullets	345
of Georgia coast	338	needlefishes	338
Fur seals		perches	340
Interim Convention for the Conservation of North Pacific Fur Seals	253	pikes	336
Gadidae—see Codfishes		pipefishes	339
<i>Gadus morhua</i> —see Atlantic cod		pirate perches	337
Gars		Pomacentridae	345
of Georgia coast	334	pompanos	340
<i>Gascogne</i> —see Vessels		porgies	341
Georgia		rays	334
coastal fishes		remoras	340
anchovies	336	sea basses	339
barracudas	346	sea catfishes	337
bluefishes	340	seahorses	339
bonefishes	334	searobins	347
butterfishes	347	sharks	334
carps	336	silversides	339
cavefishes	337	skates	334
clingfishes	338	sleepers	346
codfishes	338	snake eels	335
combtooth blennies	346	snappers	340
cusk-eels	338	snooks	339
cutlassfishes	346	sole	347
drums	341	spadefishes	345
freshwater catfishes	337	stargazers	346
freshwater eels	335	suckers	336
frogfishes	338	sunfishes	340
		tarpons	334
		Tetraodontiformes	348
		toadfishes	337
		tonguefishes	347
		tunas	347
		Skidaway River	1293
		Gerreidae—see Mojarras	
		<i>Gillichthys mirabilis</i> —see Longjaw goby	
		GISLASON, S. E. P.—see FONTAINE et al.	
		<i>Glyptocephalus cynoglossus</i> —see Gray sole	
		Gobies	
		of Georgia coast	346

Gobiesocidae—see Clingfishes		Gulf of Maine	
Gobiidae—see Gobies		abundance, distribution, movements, and	
Goby—see Longjaw goby		lengths of larval herring	307
GORDY, HERBERT R.—see LEWIS et al.		<i>Gymnodinium</i> —see Phytoplankton	
GOSSELINK, JAMES G.—see CONDREY et al.		Haddock	
GRAHAM, JOSEPH J., "Retention of larval		distribution, Nova Scotia to Long Island	641
herring within Sheepscoot estuary of Maine"	299	New York	581, 588
———, "Filtration efficiencies of Boothbay		<i>Halargyreus johnsonii</i> —see Moridae	
depressor trawls"	518	<i>Haliotis sorenseni</i> —see White abalone	
———, STANLEY B. CHENOWETH, and		HALL, J. D.—see EVANS et al.	
CLARENCE W. DAVIS, "Abundance, distri-		Hard clam	
bution, movements, and lengths of larval her-		New York	581, 596
ring along the western coast of the Gulf of		HARMON, ANTHONY W.—see KELLEY and	
Maine"	307	HARMON	
Gray sole		Hawaii	
New York	594	anchovy sampling in Kaneohe Bay	789
Great Central Lake		Oahu	49, 61
fertilization of, effect on juvenile sockeye		reef fishes	
salmon	37	diurnal	717, 727
fertilization of, effect on primary production ...	13	feeding locations	730
fertilization of, effect on zooplankton standing		nocturnal	723, 725
stock	25	shelter locations	730
Groundfish		twilight activity	731, 733, 735
Nova Scotia to Long Island		skipjack tuna and their physical environment ..	763
July-August distribution	647	Hawaii-California	
October-November distribution	646	adjusting atmospheric pressure to sea level ...	622
seasonal distribution	647	mean sea level trends	622
"Growth and food conversion of rainbow trout		sea level differences between, and California	
reared in brackish and fresh water," by Take-		coast	619
shi Murai and James W. Andrews	1293	steric levels	626
"Growth hormone- and prolactin-like proteins		surface currents	
of the blue shark (<i>Prionace glauca</i>)," by U. J.		California Current	621
Lewis, R. N. P. Singh, B. K. Seavey, R. Lasker,		Davidson Current	621
and Grace E. Pickford	933	North Equatorial Current	621
"Growth of premigratory chinook salmon in sea-		Hawaiian spinner porpoise	
water," by Bernard M. Kepshire, Jr. and Wil-		escape behavior	49
liam J. McNeil	119	"Hawaiian-caught skipjack tuna and their	
Growth		physical environment," by Gunter R. Seckel	763
king crab	225	Hawkfish	
Grunts		Hawaiian reefs	722
of Georgia coast	341	<i>Hemianulus hauckii</i> —see Diatoms	
		HENRY, KENNETH A., "Ocean distribution,	
		growth, and effects of the troll fishery on yield	

of fall chinook salmon from Columbia River hatcheries"	431	HORN, MICHAEL H., "The amount of space available for marine and freshwater fishes"	1295
Herring—see Atlantic herring		HORTON, HOWARD F.—see JOHNSON and HORTON	
Herring		HOUE, EDWARD D., "Development and early life history of the northern sennet, <i>Sphyraena borealis</i> DeKay (Pisces: Sphyraenidae) reared in the laboratory"	185
larval		Hudson Bay, Canada	61
abundance, distribution, movements, and lengths along the western coast of the Gulf of Maine	307	HUNTER, JOHN R., "Swimming and feeding behavior of larval anchovy, <i>Engraulis mordax</i> " ...	821
retention within the Sheepscoot estuary of Maine	299	—————, —see PERRIN and HUNTER	
Herrings		<i>Hydrolagus colliei</i> —see Ratfish	
of Georgia coast	335	Ictaluridae—see Freshwater catfish	
Hidden-Up-A Tree Creek, Alaska		Iliamna Lake, Alaska	355
study streams for sockeye salmon	447	"In memoriam: Oscar Elton Sette," by Reuben Lasker and Thomas A. Manar	1061
<i>Hippoglossoides platessoides</i> —see American plaice		"(The) increase in spawning biomass of northern anchovy, <i>Engraulis mordax</i> ," by Paul E. Smith	849
HOAG, STEPHEN H., "The relationship between the summer food of juvenile sockeye salmon, <i>Oncorhynchus nerka</i> , and the standing stock of zooplankton in Iliamna Lake, Alaska" ..	355	Interim Convention for the Conservation of North Pacific Fur Seals	253
HOBSON, EDMUND S., "Activity of Hawaiian reef fishes during the evening and morning transitions between daylight and darkness"	715	Interspecific relationships	
HODGINS, HAROLD O.—see JOHNSON et al.		effects upon marine ecosystems	383
Hogchoker		IRVINE, A. B.—see EVANS et al.	
New York	594	ISAACS, JOHN D., "Unstructured marine food webs and 'pollutant analogues'"	1053
<i>Holocentrus diadema</i> —see Squirrelfish		Jack mackerel	
<i>Holocentrus lacteoguttatus</i> —see Squirrelfish		apparent abundance off southern and central California	1017
<i>Holocentrus sammara</i> —see Squirrelfish		nitrogen excretion	395
<i>Holocentrus tiere</i> —see Squirrelfish		Jack salmon	
<i>Holocentrus xantherythrus</i> —see Squirrelfish		definition	80
<i>Holopedium gibberum</i> —see Zooplankton		Jacks	
<i>Holotrachys lima</i> —see Squirrelfish		of Georgia coast	340
<i>Homarus americanus</i> —see Northern lobster		Japan	
HOOPES, DAVID T., "Selection of spawning sites by sockeye salmon in small streams"	447	domestic fishery production	271
—————, and JOHN F. KARINEN, "Longevity and growth of tagged king crabs in the eastern Bering Sea"	225	fishery imports	276
		longline catches	
		blue marlin	294
		white marlin in Atlantic Ocean	291

"Japanese distant-water fisheries: A review," by Hiroshi Kasahara	227	<i>Kellicottia</i> spp.—see Zooplankton	
Japanese-Soviet Fisheries Commission regulations on salmon	248	KENDALL, ARTHUR W., JR., "Description of black sea bass, <i>Centropristis striata</i> (Lin- naeus), larvae and their occurrences north of Cape Lookout, North Carolina, in 1966"	1243
JOHNSON, ALLYN G., and HOWARD F. HORTON, "Length-weight relationship, food habits, parasites, and sex and age determination of the ratfish, <i>Hydrolagus colliei</i> (Lay and Bennett)"	421	KENNEDY, O. D.—see LeBRASSEUR and KENNEDY	
———, FRED M. UTTER, and HAROLD O. HODGINS, "Electrophoretic investigation of the family Scorpaenidae"	403	KEPESHIRE, BERNARD M., JR., and WIL- LIAM J. McNEIL, "Growth of premigratory chinook salmon in seawater"	119
JONES, ALBERT C.—see MATHER et al.		<i>Keratella cochlearis</i> —see Zooplankton	
JONES, S.—see MATSUMOTO et al.		<i>Keratella quadrata</i> —see Zooplankton	
<i>David Starr Jordan</i> —see Vessels		Killifishes of Georgia coast	338
JUDKINS, DAVID C., and ABRAHAM FLEMINGER, "Comparison of foregut con- tents of <i>Sergestes similis</i> obtained from net col- lections and albacore stomachs"	217	KIMURA, MAKOTO, and GARY T. SAKA- GAWA, "Observations on scale patterns and growth of the Pacific sardine reared in the laboratory"	1043
JUNE, FRED C., "Variations in size and length composition of Atlantic menhaden groupings"	699	"Kinds and abundance of fish larvae in the east- ern tropical Pacific on the second multi-vessel EASTROPAC survey, and observations on the annual cycle of larval abundance," by Elbert H. Ahlstrom	1153
Kalama hatcheries fall chinook salmon	431	King crab growth	225
KAMYKOWSKI, DANIEL—see McCARTHY and KAMYKOWSKI		longevity	225
Kaneohe Bay, Oahu anchovy sampling with a plankton purse seine ..	789	KLAWE, WITOLD L.—see MATSUMOTO et al.	
KARINEN, JOHN F.—see HOOPES and KARINEN		Kodiak Island, Alaska	79
Karluk River, Alaska coho salmon	79	Korean marine sovereignty Rhee Line	254
KASAHARA, HIROSHI, "Japanese distant- water fisheries: A review"	227	Kyphosidae—see Georgia coastal fishes	
<i>Katsuwonus pelamis</i> —see Skipjack tuna		La Jolla, California	1262
Kawakawa larvae, identification	5	"Laboratory observations on the early growth of the abalone, <i>Haliotis sorenseni</i> , and the effect of temperature on larval development and settling success," by David L. Leighton	373
sensory factors in spacing and orientation during schooling	197	"(A) laboratory study of particulate and filter feeding of the Pacific mackerel, <i>Scomber japon- icus</i> ," by Charles P. O'Connell and James R. Zweifel	973
KELLEY, CAROLYN E., and ANTHONY W. HARMON, "Method of determining carotenoid contents of Alaska pink shrimp and represen- tative values for several shrimp products"	111	<i>Labroides phthirophagus</i> —see Wrasses	

<i>Laemonema barbatulum</i> —see Moridae	
Lanternfish—see <i>Scopelopsis multipunctatus</i>	
Lanternfish	
genus, a review	67
new species, <i>Taaningichthys paurolychnus</i>	67
<i>Taaningichthys bathyphilus</i>	70
<i>Taaningichthys minimus</i>	69
<i>Taaningichthys paurolychnus</i>	71
Larvae	
mesh retention by plankton nets	839
Larvae, fish—see Fish larvae	
Larval development	
abalone	373
LASKER, R.—see LEWIS et al.	
———, and THOMAS A. MANAR, "In memoriam: Oscar Elton Sette"	1061
Lateral line	
in tuna schooling	197
Law of the Sea Conference	
Japanese response	269
possible outlook (1973)	267
Leather star	
as predator	208
digestion rates	210
feeding behavior	207
Leatherjacket	
juvenile	
evidence of cleaning habit	1113
food habits	1113
LEATHERWOOD, J. S.—see EVANS et al.	
LeBRASSEUR, R. J., and O. D. KENNEDY, "The fertilization of Great Central Lake. II. Zooplankton standing stock"	25
Lefteye flounders	
of Georgia coast	347
LEGGETT, WILLIAM C., and RICHARD R. WHITNEY, "Water temperature and the mi- grations of American shad"	659
LEIGHTON, DAVID L., "Laboratory observa- tions on the early growth of the abalone, <i>Haliotis</i> <i>sorenseni</i> , and the effect of temperature on lar- val development and settling success"	373
LENARZ, WILLIAM H., "Mesh retention of larvae of <i>Sardinops caerulea</i> and <i>Engraulis</i> <i>mordax</i> by plankton nets"	839
"Length-weight relationship, food habits, para- sites, and sex and age determination of the ratfish, <i>Hydrolagus collicii</i> (Lay and Bennett)," by Allyn G. Johnson and Howard F. Horton	421
<i>Lepidion eques</i> —see Moridae	
<i>Lepidion miocenica</i> —see Moridae	
Lepisosteidae—see Gars	
LEWIS, ROBERT M., E. PETER H. WIL- KENS, and HERBERT R. GORDY, "A de- scription of young Atlantic menhaden, <i>Brevoortia</i> <i>tyrannus</i> , in the White Oak River estuary, North Carolina"	115
LEWIS, U. J., R. N. P. SINGH, B. K. SEAVEY, R. LASKER, and GRACE E. PICKFORD, "Growth hormone- and prolactin-like proteins of the blue shark (<i>Prionace glauca</i>)"	933
<i>Limanda ferruginea</i> —see Yellowtail flounder	
Livebearers	
of Georgia coast	339
Lizardfishes	
of Georgia coast	336
Lobster—see Northern lobster	
"Longevity and growth of tagged king crabs in the eastern Bering Sea," by David T. Hoopes and John F. Karinen	225
Longevity	
king crab	225
Longjaw goby	
comparative effects of 10° and 18°C treat- ment on gonadal recrudescence	1148
effects of constant temperature and photo- period on	
regressing gonads	1139
stages of active gametogenesis (May)	1141
stages of active spermatogenesis (January)	1142
effects of high temperatures on gonadal func- tion in different seasons	1143
effects of long photoperiod treatment (15°C)	
on fish with regressing testes	1147
effects of photoperiod at 20°C on fish with re- gressing or quiescent gonads	1146
effects of 12° and 20°C treatment on fish in stages of active gametogenesis	1147

gonad function		MATHER, FRANK J., III, ALBERT C. JONES, and GRANT L. BEARDSLEY, JR., "Migration and distribution of white marlin and blue marlin in the Atlantic Ocean"	283
effects of 16°C treatment on	1146		
effects of 21°-22°C and photoperiod treatment on	1144		
gonadal recrudescence	1149	MATSUMOTO, WALTER M., ELBERT H. AHLSTROM, S. JONES, WITOLD L. KLAWE, WILLIAM J. RICHARDS, and SHOJI UEYANAGI, "On the clarification of larval tuna identification particularly in the genus <i>Thunnus</i> "	1
gonadal regression	1148		
inhibition of testicular regression by low temperature	1148	McCARTHY, JAMES J., and DANIEL KAMYKOWSKI, "Urea and other nitrogenous nutrients in La Jolla Bay during February, March, and April 1970"	1261
<i>Lopholatilus chamaeleonticeps</i> —see Tilefish		———, and TERRY E. WHITLEDGE, "Nitrogen excretion by anchovy (<i>Engraulis mordax</i> and <i>E. ringens</i>) and jack mackerel (<i>Trachurus symmetricus</i>)	395
<i>Lotella andrussovi</i> —see Moridae		McHUGH, J. L., "Marine fisheries of New York State"	579
<i>Lotella callarias</i> —see Moridae		McNEIL, WILLIAM J.—see KEPSHIRE and McNEIL	
<i>Lotella smirnovi</i> —see Moridae		<i>Melanogrammus aeglefinus</i> —see Haddock	
Louisiana		<i>Melichthys niger</i> —see Triggerfish	
Barataria Bay	1284	<i>Melosira italica</i> —see Phytoplankton	
Lutjanidae—see Snappers		Menhaden—see Atlantic menhaden	
Mackerel—see Jack mackerel; Pacific mackerel		<i>Mercenaria mercenaria</i> —see Hard clam	
Mackerels		Mercury	
of Georgia coast	347	synergistic effects on adult fiddler crab	415
Magdalena Bay, Baja California	62	<i>Merluccius bilinearis</i> —see Silver hake	
Maine		<i>Merriamina ectenes</i> —see Moridae	
Gulf of Maine	307	"Mesh retention of larvae of <i>Sardinops caerulea</i> and <i>Engraulis mordax</i> by plankton nets," by William H. Lenarz	839
Sheepscot estuary	299	Metallic elements in estuaries—see Estuarine ecosystems	
MAJOR, RICHARD L., and GERALD J. PAULIK, "Effect of encroachment of Wanapum Dam Reservoir on fish passage over Rock Island Dam, Columbia River"	125	<i>Meteor</i> —see Vessels	
<i>Makaira nigricans</i> —see Blue marlin		"Method of determining carotenoid contents of Alaska pink shrimp and representative values for several shrimp products," by Carolyn E. Kelley and Anthony W. Harmon	111
MANAR, THOMAS A.—see LASKER and MANAR			
Manzanillo, Mexico	62		
Marine ecosystems			
exploitation effects	393		
"Marine fisheries of New York State," by J. L. McHugh	579		
Marine fisheries			
New York	579		
Marine mammals—see Fur seals			
Marlin—see Blue marlin; White marlin			

"Methods for tagging small cetaceans," by W. E. Evans, J. D. Hall, A. B. Irvine, and J. S. Leatherwood	61	<i>Onobrosmius oligocaenicus</i>	574
Mexico		<i>Physiculus rastrelliger</i>	571
Manzanillo	62	<i>Strinsia alata</i>	571
Miami Beach, Florida	186	<i>Halargyreus johnsonii</i>	567
<i>Microlepidium verecundum</i> —see Moridae		<i>Laemonema barbatulum</i>	568
"Migration and distribution of white marlin and blue marlin in the Atlantic Ocean," by Frank J. Mather, III, Albert C. Jones, and Grant L. Beardsley, Jr.	283	<i>Lepidion eques</i>	567
Migration		<i>Lotella callarias</i>	568
American shad	659	<i>Microlepidium verecundum</i>	561, 568
skipjack tuna in the eastern Pacific Ocean	741	<i>Mora pacifica</i>	567
Minnows		<i>Physiculus nematopus</i>	562, 569
of Georgia coast	336	<i>Physiculus rastrelliger</i>	563, 568
"(A) model for optimal salmon management," by Douglas E. Booth	497	<i>Pseudophycis bachus</i>	567
Mojarras		<i>Tripterothycis gilchristi</i>	569
of Georgia coast	340	<i>Morone saxatilis</i> —see Striped bass	
"Monthly sea level differences between the Hawaiian Islands and the California coast," by J. F. T. Saur	619	MOSER, H. GEOFFREY, "Development and geographic distribution of the rockfish, <i>Sebastes macdonaldi</i> (Eigenmann and Beeson, 1893), family Scorpaenidae, off southern California and Baja California"	941
Moorish idol		———, and ELBERT H. AHLSTROM, "Development of the lanternfish, <i>Scopelopsis multipunctatus</i> Brauer 1906, with a discussion of its phylogenetic position in the family Myctophidae and its role in a proposed mechanism for the evolution of photophore patterns in lanternfishes" ..	541
Hawaiian reefs	722	MOSHER, KENNETH H., "Scale features of sockeye salmon from Asian and North American coastal regions"	141
<i>Mora pacifica</i> —see Moridae		Mudminnows	
Moridae		of Georgia coast	336
<i>Actuariolum</i> sp.	569	Mugilidae—see Mulletts	
<i>Antimora microlepis</i>	560, 567	Mulletts	
<i>Auchenoceros punctatus</i>	568	of Georgia coast	345
characters		MURAI, TAKESHI, and JAMES W. ANDREWS, "Growth and food conversion of rainbow trout reared in brackish and fresh water" ..	1293
caudal skeleton	570	MURPHY, GARTH I., and ROBERT I. CLUTTER, "Sampling anchovy larvae with a plankton purse seine"	789
fontanelles	559	———, and RICHARD S. SHOMURA, "Pre-exploitation abundance of tunas in the equatorial central Pacific"	875
otoliths	564	<i>Mya arenaria</i> —see Soft clam	
fossils		Myctophidae—see <i>Scopelopsis multipunctatus</i>	
<i>Actuariolum bicaudatum</i>	573	Myctopidae	
<i>Actuariolum terakohensis</i>	573	<i>Taaningichthys bathyphilus</i>	70
<i>Eclipes extensus</i>	573		
<i>Eclipes manni</i>	572		
<i>Eclipes santamonicae</i>	574		
<i>Eclipes veternus</i>	572		
<i>Lepidion miocenica</i>	575		
<i>Lotella andrussovi</i>	573		
<i>Lotella smirnovi</i>	574		
<i>Merriamina ectenes</i>	572		
<i>Odontobutis</i> cf. <i>obscura</i>	575		
<i>Onobrosmius elongatus</i>	571		

<i>Taaningichthys minimus</i>	69	silver hake	581, 591
<i>Taaningichthys paurolychnus</i>	71	soft clam	585
<i>Myripristis argyromus</i> —see Squirrelfish		striped bass	597
<i>Myripristis berndti</i> —see Squirrelfish		summer flounder	580, 594
<i>Myripristis multiradiatus</i> —see Squirrelfish		surf clam	580, 596
<i>Mytilus</i> spp.—see Sea mussels		tilefish	589
NAMIAS, JEROME, "Space scales of sea-surface temperature patterns and their causes" ..	611	weakfish	580, 587
<i>Nannochloris</i> —see Phytoplankton		winter flounder	580, 594
<i>Naso hexacanthus</i> —see Surgeonfish		yellowtail flounder	580, 594
<i>Naso literatus</i> —see Surgeonfish		"Nitrogen excretion by anchovy (<i>Engraulis mordax</i> and <i>E. ringens</i>) and jack mackerel (<i>Trachurus symmetricus</i>)," by James J. McCarthy and Terry E. Whitley ..	395
Needlefishes		<i>Nitzschia</i> —see Phytoplankton	
of Georgia coast	338	<i>Nitzschia turgiduloides</i> —see Diatoms	
Nets—see Plankton nets		Nocturnal fish—see Hawaii	
New combination		North Carolina	
<i>Chone eniwetokensis</i> (polychaete)	477	Bogue Inlet	115
New species		Cape Lookout	1244
<i>Chone albocincta</i> (polychaete)	479	White Oak River	115
<i>Chone valeronis</i> (polychaete)	477	North Central Pacific Ocean	
<i>Euchone velifera</i> (polychaete)	490	growth rate of phytoplankton	1071
<i>Taaningichthys paurolychnus</i>	73	skipjack tuna and their physical environment ...	764
New York		North Inlet Estuary, South Carolina	1121
marine fisheries		North Pacific Fishery Convention	
alewife	583	implementation of	247
American oyster	580, 584	North Pacific Ocean	
American shad	586	small-scale distributions of diatoms	363
Atlantic cod	580, 590	Northeast Pacific Ocean	
Atlantic herring	583	<i>Epibulia Ritteriana</i>	507
Atlantic mackerel	592	fall chinook salmon	431
Atlantic menhaden	580	Northern anchovy	
bay scallop	581, 588	apparent abundance off southern and central California	1018
black sea bass	581, 593	deep-sea observations	510
blue crab	585	estimates of biomass	849, 869
bluefish	580, 587	increase in spawning biomass	849
butterfish	581, 590	larvae	
dab	594	escapement and avoidance of nets	857
gray sole	594	mesh retention by plankton nets	839
haddock	581, 588	larval behavior	
hard clam	581, 596	burst speeds	826
hogchoker	594	daily rate of swimming	826
northern lobster	581, 598	feeding behavior	827
northern puffer	581, 591	feeding rates	832
scup	581, 593	feeding success	832
sea mussels	580, 588	food density	834
sea scallop	593	incomplete feeding sequences	829

Northern anchovy—Cont.			
larval behavior—Cont.			
reactive perceptive field	831		
significance of swimming in yolk-sac larvae ..	823		
structure of swimming	824		
swimming behavior	822		
volume of water searched	833		
models of spawning behavior	865		
sampling with a plankton purse seine	792		
Northern lobster			
developmental rates of embryos	95		
New York	581, 598		
Northern puffer			
New York	581, 591		
Northern sennet			
behavior	194		
development of larvae and juveniles			
eye diameter	188		
fin development	192		
head length	187		
jaws and teeth	187		
keeled scales	189		
myomeres	188		
osteology	189		
pigmentation	193		
snout length	187		
tip of lower jaw	187		
yolk absorption	187		
embryo	187		
mortality	193		
transformation	194		
“Nutrient inversions in the southeastern tropical Pacific Ocean,” by William H. Thomas	929		
Nutrients			
distribution in northern equatorial latitudes ..	892		
in La Jolla Bay 1970			
phaeo-pigment/chlorophyll ratio	1268		
nitrogenous, in La Jolla Bay 1970			
ammonium	1264		
nitrate	1265		
nitrite	1265		
urea	1265		
Oahu			
anchovy sampling in Kaneohe Bay	789		
Oahu, Hawaii	49, 61		
“Observations on scale patterns and growth of the Pacific sardine reared in the laboratory,” by Makoto Kimura and Gary T. Sakagawa	1043		
“Ocean distribution, growth, and effects of the troll fishery on yield of fall chinook salmon from Columbia River hatcheries,” by Kenneth A. Henry ..	431		
Ocean shrimp			
California			
application of yield models	1021		
biomass estimation	1033		
catch and effort data, 1954-69	1022		
fishing mortality estimates	1031		
spawning biomass and recruitment	1034		
<i>Oceanographer</i> —see <i>Vessels</i>			
O’CONNELL, CHARLES P., and JAMES R. ZWEIFEL, “A laboratory study of particulate and filter feeding of the Pacific mackerel, <i>Scomber japonicus</i> ”	973		
<i>Odontobutis cf. obscura</i> —see <i>Moridae</i>			
<i>Oligophites saurus</i> —see <i>Leatherjacket</i>			
OLLA, BORI L., CAROL E. SAMET, and ANNE L. STUDHOLME, “Activity and feeding behavior of the summer flounder (<i>Paralichthys dentatus</i> L.) under controlled laboratory conditions”	1127		
“On the clarification of larval tuna identification particularly in the genus <i>Thunnus</i> ,” by Walter M. Matsumoto, Elbert H. Ahlstrom, S. Jones, Witold L. Klawe, William J. Richards, and Shoji Ueyanagi	1		
<i>Oncorhynchus kisutch</i> —see <i>Coho salmon</i>			
<i>Oncorhynchus nerka</i> —see <i>Sockeye salmon</i>			
<i>Oncorhynchus tshawytscha</i> —see <i>Chinook salmon</i>			
One-Shot Creek, Alaska			
study streams for sockeye salmon	447		
<i>Onobrosmius elongatus</i> —see <i>Moridae</i>			
<i>Onobrosmius oligocaenicus</i> —see <i>Moridae</i>			
Ophichthidae—see <i>Snake eels</i>			
Ophidiidae—see <i>Cusk-eels</i>			
Oregon			
ratfish collected for study of its biology	421		
“Oscar Elton Sette,” by Philip M. Roedel	523		
“Oscar Elton Sette: fishery biologist,” by Patricia Powell	525		

Pacific barracuda		for culture	101
apparent abundance off southern and central California	1015	system for collecting large numbers of live postlarval	
		description of equipment	1298
		evaluation of system	1301
		operation of system	1301
Pacific bonito		<i>Penaeus aztecus</i> —see Brown shrimp	
apparent abundance off southern and central California	1018	<i>Penaeus setiferus</i> —see White shrimp	
Pacific coast		<i>Peprilus triacanthus</i> —see Butterfish	
Scorpaenidae	404	Perches—see Pirate perches	
Pacific mackerel		Perches	
apparent abundance off southern and central California	1017	of Georgia coast	340
laboratory study of particulate and filter feeding		Percidae—see Perches	
response to <i>Artemia adults</i>	976	PERKINS, HERBERT C., "Developmental rates at various temperatures of embryos of the northern lobster (<i>Homarus americanus</i> Milne-Edwards)"	95
response to <i>Artemia nauplii</i>	975	PERRIN, WILLIAM F., "Color patterns of spinner porpoises (<i>Stenella cf. S. longirostris</i>) of the eastern Pacific and Hawaii, with comments on delphinid pigmentation"	983
Pacific Ocean		———, and JOHN R. HUNTER, "Escape behavior of the Hawaiian spinner porpoise (<i>Stenella cf. S. longirostris</i>)"	49
North, surface temperature patterns	611	Peru	
temperature and shad migration	666	coastal	
<i>Pacific Queen</i> —see Vessels		growth rate of phytoplankton	1070
Pacific sardine		<i>Pervagor spilosoma</i> —see Filefish	
apparent abundance off southern and central California	1017	<i>Phacus</i> —see Phytoplankton	
larvae		<i>Phalarope</i> —see Vessels	
mesh retention by plankton nets	839	Photophores	
scale patterns and growth in laboratory	1043	development in lanternfishes	547
<i>Pandalus jordani</i> —see Ocean shrimp		theory of evolution of pattern in lanternfishes ..	556
<i>Panulirus</i> —see Vessels		<i>Physiculus nematopus</i> —see Moridae	
<i>Paracirrhites arcatus</i> —see Hawkfish		<i>Physiculus rastrelliger</i> —see Moridae	
<i>Paracirrhites forsteri</i> —see Hawkfish		Phytoplankton—see Diatoms	
<i>Paralichthys dentatus</i> —see Summer flounder		Phytoplankton	
<i>Paralithodes camtschatica</i> —see King crab		<i>Chlamydomonas mundana</i>	1066
PARRISH, JAMES D.—see SAILA and PARRISH		<i>Chlorella pyrenoidosa</i>	1064
Parrotfish		<i>Ditylum brightwellii</i>	1076
Hawaiian reefs	718	<i>Dunaliella tertiolecta</i>	1066
PARSONS, T. R., K. STEPHENS, and M. TAKAHASHI, "The fertilization of Great Central Lake. I. Effect of primary production" ..	13		
PAULIK, GERALD J.—see MAJOR and PAULIK			
<i>Pawnee</i> —see Vessels			
Penaeid shrimp			
environmental and nutritional requirements			

Phytoplankton—Cont.			
Great Central Lake			
<i>Chroococcus</i>	18		<i>Chone mollis</i>
<i>Cyclotella</i>	18		<i>Chone paucibranchiata</i>
<i>Dinobryon</i>	18		<i>Chone teres</i>
<i>Gymnodinium</i>	18		<i>Chone veleronis</i>
<i>Nannochloris</i>	18		<i>Euchone alicaudata</i>
<i>Nitzschia</i>	18		<i>Euchone analis</i>
<i>Phacus</i>	18		<i>Euchone capensis</i>
<i>Rhizosolenia</i>	18		<i>Euchone elegans</i>
<i>Tabellaria</i>	18		<i>Euchone papillosa</i>
implications for simulation models of phyto-			<i>Euchone rubrocincta</i>
plankton production	1079		<i>Euchone velifera</i>
interrelation between growth rate and assim-			
ilation number	1072		<i>Polyphemus pediculus</i> —see Zooplankton
<i>Melosira italica</i>	1078		Pomacentridae—see Georgia coastal fishes
<i>Procystis</i> sp.	1069		<i>Pomacentrus jenkinsi</i> —see Damselfish
<i>Skeletonema costatum</i>	1075		Pomadasyidae—see Grunts
variation of assimilation number with tem-			Pomatomidae—see Bluefishes
perature in the sea	1075		<i>Pomatomus saltatrix</i> —see Bluefish
PICKFORD, GRACE E.—see LEWIS et al.			Pompanos
Pikes			of Georgia coast
of Georgia coast	336		340
Pinfish—see Spottail pinfish			Porgies
Pipefishes			of Georgia coast
of Georgia coast	339		341
Pirate perches			Porpoise—see Hawaiian spinner porpoise;
of Georgia coast	337		Spinner porpoise
Plankton—see Phytoplankton; Zooplankton			POTTHOFF, THOMAS—see DRAGOVICH and
Plankton			POTTHOFF
distribution in northern equatorial latitudes ...	893		POWELL, PATRICIA, "Oscar Elton Sette:
Plankton nets			fishery biologist"
mesh retention of larvae	839		525
<i>Plectroglyphidodon johnstonianus</i> —see Damselfish			"(A) predator-prey relationship between the
Poeciliidae—see Livebearers			leather star, <i>Dermasterias imbricata</i> , and the
Point Conception, California	62		purple urchin, <i>Strongylocentrotus purpuratus</i> ,"
Point Loma, California	205		by Richard J. Rosenthal and James R. Chess
Polychaetes, sabellid			205
<i>Chone albocincta</i>	479		"Pre-exploitation abundance of tunas in the
<i>Chone aurantiaca</i>	467		equatorial central Pacific," by Garth I. Murphy
<i>Chone duneri</i>	466		and Richard S. Shomura
<i>Chone ecquadata</i>	473		875
<i>Chone eniwetokensis</i>	477		"Preliminary studies of selected environmental
<i>Chone gracilis</i>	470		and nutritional requirements for the culture of
<i>Chone infundibuliformis</i>	460		penaeid shrimp," by Lowell V. Sick, James W.
<i>Chone magna</i>	472		Andrews, and David B. White
			101
			<i>Priacanthus cruentatus</i> —see Bigeyes
			<i>Prionace glauca</i> —see Blue shark
			<i>Pseudophycis bachus</i> —see Moridae

<i>Pseudopleuronectes americanus</i> —see Winter flounder		REINTJES, JOHN W.—see CARLSON and REINTJES	
<i>Pterois sphex</i> —see Scorpionfish			
Purple urchin		“(The) relationship between the summer food of juvenile sockeye salmon, <i>Oncorhynchus nerka</i> , and the standing stock of zooplankton in Iliamna Lake, Alaska,” by Stephen H. Hoag . . .	355
as prey	208		
defensive responses	212		
Purse seine		Remoras	
Japanese-Chinese restrictions on	256	of Georgia coast	340
<i>Pyrocystis</i> sp.—see Phytoplankton		“Research and the Fisheries Service’s second 100 years,” by Philip M. Roedel	537
<i>Queen Mary</i> —see Vessels		“Retention of larval herring within the Sheepscot estuary of Maine,” by Joseph J. Graham	299
Rainbow trout		“(A) review of the lanternfish genus <i>Taaningichthys</i> (family Myctophidae) with the description of a new species,” by Brent Davy	67
growth and food conversion of, reared in brackish and fresh water			
acclimation to brackish water	1293	Revillagigedo Islands	
growth, survival, and food conversion data	1294	models of migration of young skipjack tuna	751
Rainfall runoff		Rhee line	
determinant of elements leached from the land and transported to estuary	964	marine sovereignty of Korea	254
Rajidae—see Skates and Rays		RICHARDS, WILLIAM J.—see MATSUMOTO et al.	
Ratfish		<i>Rhinecanthus rectangulus</i> —see Triggerfish	
food habits	421	<i>Rhizosolenia</i> —see Phytoplankton	
length-weight relationship	421	RICE, T. R.—see WOLFE and RICE	
parasites of	421	ROBINSON, D.—see BARRACLOUGH and ROBINSON	
sex and age determination	421	ROBSON, D. S.—see ROTHSCCHILD and ROBSON	
Rays		Rock Island Dam, Washington	125
of Georgia coast	334	<i>Rockaway</i> —see Vessels	
“Rediscription of some species of <i>Chone</i> Kröyer and <i>Euchone</i> Malmgren, and three new species (Sabellidae, Polychaeta),” by Karl Banse	459	Rockfish	
Reef fishes		off southern California and Baja California	
Hawaiian		distinguishing features	944
bigeyes	724	distribution	955
blennies	722	fin development	946
butterflyfishes	722	general morphology	944
cardinalfishes	722	pigmentation	949
damsel-fishes	717	sequence of ossification	951
filefishes	720	ROEDEL, PHILIP M., “Oscar Elton Sette”	523
hawkfishes	722	———, “Research and the Fisheries Service’s second 100 years”	537
moorish idol	722		
parrotfish	718		
scorpionfishes	724		
squirrelfishes	722		
surgeonfishes	718		
triggerfishes	720		
wrasses	718		

ROSENTHAL, RICHARD J., and JAMES R. CHESSE, "A predator-prey relationship between the leather star, <i>Dermasterias imbricata</i> , and the purple urchin, <i>Strongylocentrotus purpuratus</i> "	205	SAUR, J. F. T., "Monthly sea level differences between the Hawaiian Islands and the California coast"	619
ROTHSCHILD, BRIAN J., "An exposition on the definition of fishing effort"	671	"Scale features of sockeye salmon from Asian and North American coastal regions," by Kenneth H. Mosher	141
———, and D. S. ROBSON, "The use of concentration indices in fisheries"	511	Scales	
ROYCE, WILLIAM F., "Undergraduate education of fishery scientists"	681	description of, from	
SAILA, SAUL B., and JAMES D. PARRISH, "Exploitation effects upon interspecific relationships in marine ecosystems"	383	Alaska Peninsula	171
St. Johns River, Florida	660	Bristol Bay	170, 175, 178
SAKAGAWA, GARY T.—see KIMURA and SAKAGAWA		British Columbia	172
Salinity		Cook Inlet	171, 175
determinant in the distribution and cycling of elements in estuaries	966	Copper River area	172, 175
synergistic effects on adult fiddler crab	415	north of Bristol Bay	169
<i>Salmo gairdneri</i> —see Rainbow trout		Southeastern Alaska	172, 178
Salmon—see Chinook salmon; Sockeye salmon		USSR	169, 174, 177
Salmon fisheries		Washington and Oregon	172, 175
abstention line	247	features	
Japan-Soviet regulation on	248	sockeye salmon	141
Japanese development of	238	<i>Scapholeberis kingi</i> —see Zooplankton	
optimal management model	497	<i>Scarus dubius</i> —see Parrotfish	
SAMET, CAROL E.—see OLLA et al.		<i>Scarus perspicillatus</i> —see Parrotfish	
"Sampling anchovy larvae with a plankton purse seine," by Garth I. Murphy and Robert I. Clutter	789	<i>Scarus rubroviolaceus</i> —see Parrotfish	
San Diego, California	62	<i>Scarus sordidus</i> —see Parrotfish	
San Francisco Bay, California	1138	<i>Scarus taeniurus</i> —see Parrotfish	
Sarasota, Florida	63	Schooling	
<i>Sarda chiliensis</i> —see Pacific bonito		orientation of tuna during	197
Sardine—see Pacific sardine		Sciaenidae—see Drums	
<i>Sardinops caerulea</i> —see Pacific sardine		<i>Scofield</i> —see Vessels	
<i>Sardinops sagax</i> —see Pacific sardine		<i>Scomber japonicus</i> —see Pacific mackerel	
		Scombridae—see Mackerels; Tunas	
		<i>Scopelopsis multipunctatus</i>	
		development	
		fins	546
		morphology	542
		photophores	547
		pigmentation	547
		<i>Scorpaena conioarta</i> —see Scorpionfish	
		Scorpaenidae	
		species identification by electrophoresis	405
		Scorpionfish	
		electrophoretic investigations	403
		Hawaiian reefs	724

SCOTT, J. MICHAEL, and GLENN A. FLITNER, "Behavior of bluefin tuna schools in the eastern North Pacific Ocean as inferred from fishermen's logbooks, 1960-67"	915	chaetognaths	220
Scup		euphausiids	220
New York	581, 593	<i>Seriola dorsalis</i> —see Yellowtail	
Sea basses		Serranidae—see Sea basses	
of Georgia coast	339	Sharks—see Blue shark	
Sea catfishes		Sharks	
of Georgia coast	337	of Georgia coast	334
Sea level		Sheepscot estuary, Maine	
monthly differences between Hawaiian Islands and California coast	619	retention of larval herring	299
Sea mussels		SHOMURA, RICHARD S.—see MURPHY and SHOMURA	
New York	580, 588	<i>Shoyo Maru</i> —see Vessels	
Sea scallop		Shrimp—see Alaska pink shrimp; Brown shrimp; Ocean shrimp; Penaeid shrimp; White shrimp	
New York	593	Shrimp, oceanic—see <i>Sergestes similis</i>	
Seahorses		SICK, LOWELL V., JAMES W. ANDREWS, and DAVID B. WHITE, "Preliminary studies of selected environmental and nutritional requirements for the culture of penaeid shrimp" ...	101
of Georgia coast	339	SILLIMAN, RALPH P., "Effect of crowding on relation between exploitation and yield in <i>Tilapia macrocephala</i> "	693
Seals—see Fur seals		Silver hake	
<i>Searcher</i> —see Vessels		New York	581, 591
<i>Searchtide</i> —see Vessels		Silversides	
Searobins		of Georgia coast	339
of Georgia coast	347	SINGH, R. N. P.—see LEWIS et al.	
SEAVEY, B. K.—see LEWIS et al.		Siphonophore	
<i>Sebastes macdonaldi</i> —see Rockfish		<i>Epibulia ritteriana</i>	507
SECKEL, GUNTER R., "Hawaiian-caught skipjack tuna and their physical environment" ...	763	Skates	
"(A) second record of a rare siphonophore <i>Epibulia ritteriana</i> Haeckel 1888," by A. Alvarino	507	of Georgia coast	334
"Selection of spawning sites by sockeye salmon in small streams," by David T. Hoopes	447	<i>Skeletonema costatum</i> —see Phytoplankton	
"Selectivity of towed-net samplers," by Richard A. Barkley	799	Skidaway River, Georgia	1293
"Sensory factors in the side-to-side spacing and positional orientation of the tuna, <i>Euthynnus affinis</i> , during schooling," by Phyllis H. Cahn	197	Skipjack tuna	
<i>Sergestes similis</i>		environmental influence over distribution	880
primary food items		Hawaiian-caught and their environment	763
calanoids	220	larvae	
		selectivity of towed-net samplers	813
		larvae, identification	3

Skipjack tuna—Cont.		"Some life history characteristics of coho salmon of the Karluk River system, Kodiak Island, Alaska," by Benson Drucker	79
migration models of the young	741		
off coast of West Africa			
comparison of food with yellowfin	1087		
Sleepers		Sorensen's abalone—see White abalone	
of Georgia coast	346		
"Small-scale distributions of oceanic diatoms,"		South Carolina	
by E. L. Venrick	363	North Inlet Estuary	1121
<i>Hugh M. Smith</i> —see Vessels		Southern bluefin tuna	
SMITH, PAUL E., "The increase in spawning		larvae, identification	8
biomass of northern anchovy, <i>Engraulis mordax</i> "	849	"Space scales of sea-surface temperature patterns and their causes," by Jerome Namias	611
Snake eels		Spadefishes	
of Georgia coast	335	of Georgia coast	345
Snappers		Sparidae—see Porgies	
of Georgia coast	340	<i>Sphoeroides maculatus</i> —see Northern puffer	
Snooks		<i>Sphyraena argentea</i> —see Pacific barracuda	
of Georgia coast	339	<i>Sphyraena borealis</i> —see Northern sennet	
SOARES, JOSEPH H., JR.—see BAUERSFELD		Sphyraenidae—see Barracudas	
and SOARES		Sphyraenidae	
Sockeye salmon		<i>Sphyraena borealis</i>	185
juvenile distribution by time and season	39, 44	Spill pattern manipulation	
juveniles, effect of artificial lake fertilization		effect on	
on growth of	45	ladder choice	136
juveniles, food of	40, 43	travel time	137
passage over Rock Island Dam		Spinner porpoise	
distribution by ladder	133, 139	color patterns of closely related delphinids	992
percentage tagged fish observed	133, 139	eastern spinner	
travel time over ladders	134, 139	development and color pattern	986
scale features		geographical variation of color pattern	990
Asian coast	141	whitebelly spinner	
North American coast	141	development and color pattern	988
selection of spawning sites	447	<i>Spisula solidissima</i> —see Surf clam	
spawning sites in Great Central Lake	39	Sport fishing	
summer food of juvenile salmon and zooplankton in Iliamna Lake, Alaska	355	blue marlin	284
tagging	130	white marlin	284
Soft clam		Spottail pinfish	
New York	585	juvenile	
Solar energy		evidence of cleaning habit	1114
affecting productivity in a trophic web	966	food habits	1114
Soleidae—see Soles		Spring Creek Hatcheries	
Soles		fall chinook salmon	431
of Georgia coast	347	Squalidae—see Sharks	

SQUIRE, JAMES L., JR., "Apparent abundance of some pelagic marine fishes off the southern and central California coast as surveyed by an airborne monitoring program"	1005	Surface tuna pre-exploitation abundance in equatorial central Pacific Ocean	902
Squirrelfish Hawaiian reefs	722	Surgeonfish Hawaiian reefs	718
Starfish—see Leather star		"Swimming and feeding behavior of larval anchovy, <i>Engraulis mordax</i> ," by John R. Hunter ...	821
Stargazers of Georgia coast	346	"(The) synergistic effects of temperature, salinity, and mercury on survival and metabolism of the adult fiddler crab, <i>Uca pugilator</i> ," by Winona B. Vernberg and John Vernberg	415
<i>Stenella roseiventris</i> —see Hawaiian spinner porpoise		Syngnathidae—see Pipefishes and Seahorses	
<i>Stenella longirostris</i> —see Spinner porpoise		Synodontidae—see Lizardfishes	
<i>Stenella microps</i> —see Hawaiian spinner porpoise		"(A) system for collecting large numbers of live postlarval penaeid shrimp," by C. T. Fontaine, S. E. P. Gislason, and W. L. Trent	1298
<i>Stenella roseiventris</i> —see Hawaiian spinner porpoise		<i>Taaningichthys minimus</i> —see Lanternfish	
<i>Stenotomus chrysops</i> —see Scup		<i>Taaningichthys minimus</i> —see Lanternfish	
STEPHENS, K.—see PARSONS et al.		<i>Taaningichthys paurolychnus</i> —see Lanternfish	
<i>Stolephorus purpureus</i> —see Anchovy		<i>Tabellaria</i> —see Phytoplankton	
Stromateidae—see Butterfishes		Tagging—see Chinook salmon; Sockeye salmon	
<i>Strongylocentrotus purpuratus</i> —see Purple urchin		Tagging blue marlin	290
<i>Strinsia alata</i> —see Moridae		<i>Delphinapterus leucas</i>	61
Striped bass New York	597	<i>Delphinus delphis</i>	62
STUDHOLME, ANNE L.—see OLLA et al.		<i>Lagenorhynchus obliquidens</i>	62
Suckers of Georgia coast	336	small cetaceans	61
<i>Sufflamen bursa</i> —see Triggerfish		<i>Stenella attenuata</i>	61
Summer flounder activity and feeding behavior under controlled laboratory conditions		<i>Stenella graffmani</i>	62
activity cycle	1130	<i>Stenella</i> spp.	61
feeding	1130	<i>Steno bredanensis</i>	61
fright response	1134	<i>Tursiops gilli</i>	62
resting	1128	<i>Tursiops truncatus</i>	62
swimming	1129	white marlin	286
New York	580, 594	TAKASHI, M.—see PARSONS et al.	
Sunfishes of Georgia coast	340	Tarpons of Georgia coast	334
Surf clam New York	580, 596	Temperature distribution in northern equatorial latitudes ...	892
		effect on developmental rate of northern lobster embryos	95
		effect on larval development and settling success	373

Temperature—Cont.	
growth rate measurements in the natural phytoplankton at different temperatures	1069
synergistic effects on the adult fiddler crab	415
variation of phytoplankton assimilation number with temperature in the sea	1075
“Temperature and phytoplankton growth in the sea,” by Richard W. Eppley	1063
Temperature patterns	
North Pacific Ocean surface	611
“Temperature trends and the distribution of groundfish in continental shelf waters, Nova Scotia to Long Island,” by John B. Colton, Jr. . . .	637
Tetraodontiformes—see Georgia coastal fishes	
<i>Tetrapturus albidus</i> —see White marlin	
<i>Thalassoma duperrey</i> —see Wrasses	
THOMAS, WILLIAM H., “Nutrient inversions in the northeastern tropical Pacific Ocean”	929
Thompson—see Vessels	
<i>Thunnus</i>	
larvae, identification	1
<i>Thunnus alalunga</i> —see Albacore	
<i>Thunnus albacares</i> —see Yellowfin tuna	
<i>Thunnus atlanticus</i> —see Blackfin tuna	
<i>Thunnus maccoyii</i> —see Southern bluefin tuna	
<i>Thunnus obesus</i> —see Bigeye tuna	
<i>Thunnus thynnus</i> —see Bluefin tuna	
<i>Tilapia macrocephala</i>	
effect on yield of, by	
crowding	693
exploitation	694
Tilefish	
New York	589
Toadfishes	
of Georgia coast	337
TOMLINSON, PATRICK K.—see ABRAMSON and TOMLINSON	
Tonguefishes	
of Georgia coast	347
<i>Trachurus symmetricus</i> —see Jack mackerel	
Trawl fisheries	
Japanese-Chinese agreements on	255
Japanese development of	229
TRENT, W. L.—see FONTAINE et al.	
Trichiuridae—see Cutlassfishes	
Triggerfish	
Hawaiian reefs	720
Triglidae—see Searobins	
<i>Trinectes maculatus</i> —see Hogchoker	
<i>Tripterophyscis gilchristi</i> —see Moridae	
Troll fishing, effect on yield	
fall chinook salmon	438
Trout—see Rainbow trout	
Tuna—see Albacore; Bigeye tuna; Black skipjack tuna; Kawakawa; Skipjack tuna; Southern Bluefin tuna; Yellowfin tuna	
Tuna	
Georgia coast	347
Japanese development of fisheries	241
larvae, identification	1
pre-exploitation abundance in equatorial central Pacific Ocean	875
Tuna food	
comparison between	
skipjack	1094
yellowfin	1094
composition	
crustaceans	1092
fishes	1090
mollusks	1092
evaluation of food organisms	1097
juvenile tunas as food of	
skipjack	1093
yellowfin	1093
seasonal changes in taxonomic composition of forage organisms	1096
variation in, related to size of tunas and volume of stomach contents	1094
<i>Uca pugilator</i> —see Fiddler crab	
UEYANAGI, SHOJI—see MATSUMOTO et al.	
Umbridae—see Mudminnows	

<i>Undaunted</i> —see Vessels	
“Undergraduate education of fishery scientists,” by William F. Royce	681
USSR	
scale features of sockeye salmon	169
“Unstructured marine food webs and ‘pollutant analogues,’” by John D. Isaacs	1053
Uranoscopidae—see Stargazers	
Urchins—see Purple urchin	
“Urea and other nitrogenous nutrients in La Jolla Bay during February, March, and April 1970,” by James M. McCarthy and Daniel Kamy- kowski	1261
Urea	
fish excretions as source in the sea	399
“(The) use of concentration indices in fisher- ies,” by B. J. Rothschild and D. S. Robson	511
UTTER, FRED M.—see JOHNSON et al.	
“Variations in size and length composition of Atlantic menhaden groupings,” by Fred C. June .	699
<i>Velero</i> —see Vessels	
<i>Velero IV</i> —see Vessels	
VENRICK, E. L., “Small-scale distributions of oceanic diatoms”	363
VERNBERG, WINONA B., and JOHN VERN- BERG, “The synergistic effects of temperature, salinity, and mercury on survival and metabo- lism of the adult fiddler crab, <i>Uca pugilator</i> ”	415
Vessels	
<i>Akademik Kurchatov</i>	1161
<i>Alaminos</i>	1188
<i>Alaska</i>	562, 564
<i>Albatross</i>	561, 562, 563, 564, 1160
<i>Albatross III</i>	641
<i>Albatross IV</i>	641
<i>Alpha Helix</i>	396, 938
<i>Anne M</i>	996
<i>Argo</i>	1164
<i>Carol Virginia</i>	996
<i>Challenger</i>	799
<i>Conquest</i>	996
<i>Conte Bianco</i>	996
<i>Townsend Cromwell</i>	813
<i>Dana</i>	555, 1160
<i>Decibar</i>	39
<i>Deepstar 4000</i>	510
<i>Delaware</i>	641, 665
<i>Discovery</i>	542
<i>Dolphin</i>	1244
<i>Eltanin</i>	542, 569, 570, 1160
<i>Gascogne</i>	930
<i>Connie Jean</i>	996
<i>David Starr Jordan</i>	507, 750, 1153
<i>Meteor</i>	554
<i>Oceanographer</i>	1154
<i>Pacific Queen</i>	996
<i>Panulirus</i>	621
<i>Pawnee</i>	1160
<i>Phalarope</i>	308
<i>Queen Mary</i>	996
<i>Rockaway</i>	1153
<i>Scotfield</i>	563, 564
<i>Searcher</i>	562
<i>Searchtide</i>	510
<i>Shoyo Maru</i>	1160
<i>Hugh M. Smith</i>	930
<i>Thompson</i>	396
<i>Undaunted</i>	1088, 1153
<i>Velero</i>	562, 564
<i>Velero IV</i>	67
<i>Washington</i>	1153
<i>Yelcho</i>	1197
Virginia	
York River	662
<i>Vosella</i> spp.—see Sea mussels	
Wanapum Dam, Washington	125
Washington—see Vessels	
Washington	
Columbia River	125, 660
Rock Island Dam	125
Wanapum Dam	125
Washington and Oregon	
scale features of sockeye salmon	172
“Water temperature and the migrations of American shad,” by William C. Leggett and Richard R. Whitney	659
Weakfish	
New York	580, 587
WHITE, DAVID B.—see SICK et al.	
White abalone	
early growth	373

- White marlin
 Atlantic
 migration and distribution 283
- White Oak River, North Carolina 115
- White shrimp
 environmental requirements for culture
 aeration 104, 105
 stocking density 104, 106
 substrate 102, 105
 net assimilation efficiency
 algal mat 1288
 organics and organic moieties
 feeding efficiency of 1287
 minimum net assimilation rates of 1287
 net assimilation efficiency of 1286
- WHITLEDGE, TERRY E.—see McCARTHY
 and WHITLEDGE
- WHITNEY, RICHARD R.—see LEGGETT and
 WHITNEY
- WILKENS, E. PETER H.—see LEWIS et al.
- WILLIAMS, F., "Consideration of three pro-
 posed models of the migration of young skipjack
 tuna (*Katsuwonus pelamis*) into the eastern Pa-
 cific Ocean" 741
- Wind
 distribution in northern equatorial latitudes ... 892
 significant energy input in shallow estuaries ... 966
- Winter flounder
 New York 580, 594
- WOLFE, D. A., and T. R. RICE, "Cycling of
 elements in estuaries" 959
- Wrasses
 Hawaiian reefs 718
- Yelcho*—see Vessels
- Yellowfin tuna
 environmental influence over distribution 880
 larvae, identification 4
 off coast of West Africa
 comparison of food with skipjack 1087
- Yellowtail
 apparent abundance off southern and central
 California 1015
- Yellowtail flounder
 distribution, Nova Scotia to Long Island 641
 New York 580, 594
- York River, Virginia 662
- Zanclus canescens*—see Moorish idol
- Zebrasoma flavescens*—see Surgeonfish
- Zone agreements with Japan
 Australia 260
 Indonesia 260
 Japanese position 262
 Korea 254
 Mexico 258
 New Zealand 258
 People's Republic of China 255
 USSR 248
 United States 256
 West Africa 261
- Zooplankton
 Great Central Lake
Alona affinis 27
Bosmina coregoni 29
Conochilus unicornis 29
Cyclops bicuspidatus thomasi 27
Cyclops vernalis 27
Daphnia longiremis 28
Daphnia pulex 28
Diaptomus kenai 30
Diaptomus oregonensis 30
 effect of fertilization on biomass 33
 effect of fertilization on egg production 31
 effect of fertilization on patchiness 27
 effect of fertilization on seasonal abundance . 29
 effect of fertilization on sex ratio 30
 effect of fertilization on vertical distribution . 28
Epischura nevadensis 29
Holopedium gibberum 29
Kellicottia spp. 28
Keratella cochlearis 26
Keratella quadrata 26
Polyphemus pediculus 27
Scapholeberis kingi 27
 summer food for juvenile sockeye salmon
Bosmina coregoni 356
Cyclops scutifer 356
Daphnia longiremis 356
Diaptomus gracilis 356
Erytemora yukonensis 356
Holopedium gibberum 356
- ZWEIFEL, JAMES R.—see O'CONNELL and
 ZWEIFEL