

## INDEX TO VOLUME 54

	Page		Page
Acanthuridae, surgeon fish.....	98	Connecticut River shad.....	247
<i>Acipenser fulvescens</i> .....	3	CONTAGIOUS DISEASE OF SALMON POSSIBLY OF VIRUS ORIGIN, by R. R. Rucker, W. J. Whipple, J. R. Parvin, and C. A. Evans.....	35-46
Age determination of shad.....	187	<i>Coregonus artedii</i> .....	1
<i>Alaska</i> , research vessel.....	72	<i>clupeaformis</i> .....	1
<i>Albatross</i> , research vessel.....	132	Crab larvae, food for yellowfin tuna.....	98-106
<i>Albatross III</i> , research vessel.....	145, 153	<i>Crassostrea virginica</i> .....	167, 181
Algae, planktonic.....	227	Cutthroat trout fingerlings.....	38, 45
<i>Alosa sapidissima</i> .....	187, 199, 247	<i>Dana</i> research vessel.....	139
Amphipods, food of yellow fin.....	125	<i>Decapterus</i> sp.....	98
Animal marking experiments.....	65	<i>Delaware</i> , research vessel.....	151
Annuli or winter rings on shad scales.....	188	Demond, Joan, and Joseph E. King: ZOOPLANKTON ABUNDANCE IN THE CENTRAL PACIFIC.....	111-144
false.....	188	DETERMINING AGE OF ATLANTIC SHAD FROM THEIR SCALES, by James P. Cating.....	187-199
spawning marks.....	189, 195	EFFECT OF DISSOLVED ORGANIC SUBSTANCES ON OYSTERS, by Albert Collier, S. M. Ray, A. W. Magnitzky, and Joe O. Bell.....	167-185
striae.....	190	England, pilehard population study.....	203
transverse grooves.....	190, 195	English Channel, off Boulogne, pilehards.....	203
<i>artedii</i> , <i>Coregonus</i> [= <i>Leucichthys</i> ].....	1	<i>Engraulis mordax</i> , anchovy.....	210
<i>Asterionella</i> .....	86, 228	Equatorial current, Pacific, effect on zooplankton abundance.....	131
<i>formosa</i> .....	228	ESTIMATION OF GROWTH RATE IN ANIMALS BY MARK- ING EXPERIMENTS, by Milton J. Lindner.....	65-69
<i>japonica</i> .....	81	Euphausiids, in stomachs of adult yellowfin.....	125
Atlantic coast shad.....	187	European pilehard.....	203-205
<i>Bacterium coli</i> .....	86	Evans, C. A., R. R. Rucker, W. J. Whipple, and J. R. Parvin: A CONTAGIOUS DISEASE OF SALMON POSSIBLY OF VIRUS ORIGIN.....	35-46
Bell, Joe O., Albert Collier, S. M. Ray, and A. W. Magnitzky: EFFECT OF DISSOLVED ORGANIC SUB- STANCE ON OYSTERS.....	167-185	Felin, Frances E., POPULATION HETEROGENEITY IN THE PACIFIC PILCHARD.....	201-225
<i>bilinearis</i> , <i>Merluccius</i> .....	147	FLUCTUATIONS IN THE FISHERIES OF STATE OF MICHIGAN WATERS OF GREEN BAY, by Ralph Hile, George F. Lunger, and Howard J. Buettner.....	1-34
Biotic INFLUENCE AFFECTING POPULATION GROWTH OF PLANKTONIC ALGAE, by Theodore R. Rice.....	227-245	FOOD OF YELLOWFIN TUNA IN THE CENTRAL PACIFIC, by John W. Reintjes and Joseph E. King.....	91-110
Bluebacks, virus disease.....	35	<i>formosa</i> , <i>Asterionella</i> .....	228
Buettner, Howard J., Ralph Hile, and George F. Lunger: FLUCTUATIONS IN THE FISHERIES OF STATE OF MICHIGAN WATERS OF GREEN BAY.....	1-34	Fredin, Reynold A.: CAUSES OF FLUCTUATIONS IN ABUNDANCE OF CONNECTICUT RIVER SHAD.....	247-259
<i>caerulea</i> , <i>Sardinops</i> .....	201	Freezing sea water, techniques and analysis.....	71
Carbohydrates in sea water, estimating.....	182	French and Spanish coasts, pilehard growth data.....	203
<i>Carnegie</i> , research vessel.....	131, 138	<i>fulvescens</i> , <i>Acipenser</i> .....	3
<i>Caspiola caspia</i> .....	60	Georges Bank trawl data.....	146, 156
Cating, James P.: DETERMINING AGE OF ATLANTIC SHAD FROM THEIR SCALES.....	187-199	statistical subareas.....	146
CAUSES OF FLUCTUATIONS IN ABUNDANCE OF CON- NECTICUT RIVER SHAD, by Reynold A. Fredin.....	247-259	<i>Globigerina</i> , Pacific.....	132
Central Pacific, food of yellowfin tuna.....	91-110	Green Bay (Mich.) fisheries.....	1-34
zooplankton abundance.....	111-144	Growth rate in animals by marking experiments.....	65-69
<i>Chlorella pyrenoidosa</i> , growth in culture medium.....	227, 229	Grunion.....	47, 60
<i>ulgaris</i> .....	227, 228		
Christmas Island (Line Island group) food of tuna.....	99		
Cisco.....	1		
<i>clupeaformis</i> , <i>Coregonis</i> .....	1		
Collier, Albert, S. M. Ray, A. W. Magnitzky, and Joe O. Bell: EFFECT OF DISSOLVED ORGANIC SUBSTANCES ON OYSTERS.....	167-185		
Collier, Albert W., and Kenneth T. Marvin: STA- BILIZATION OF THE PHOSPHATE RATIO OF SEA WATER BY FREEZING.....	71-76		

	Page		Page
Hawaiian waters, yellowfin tuna spawning.....	47	<i>nerka</i> , <i>Oncorhynchus</i> .....	35
Haddock.....	148	<i>Nitzschia</i> .....	81, 228
Halibut.....	147	North-south migration of pilchard.....	209
<i>Henry O'Malley</i> , research vessel.....	92	Ocean perch.....	150
Herring, Great Lakes.....	3, 12, 17	<i>Oncorhynchus nerka</i> .....	35
Volga-Caspian.....	60	<i>Osmerus mordax</i> , smelt.....	2
Heterogeneity in pilchard stocks.....	201	Oysters, effect of dissolved organic substances on.....	168, 173, 181, 183
Hile, Ralph, George F. Lunger, and Howard J. Buechner: FLUCTUATIONS IN THE FISHERIES OF STATE OF MICHIGAN WATERS OF GREEN BAY.....	1-34	Ova spawned by yellowfin tuna.....	60
<i>Hugh M. Smith</i> , research vessel.....	92,		
	104, 108, 112, 113, 114, 131, 137		
<i>japonica</i> , <i>Asterionella</i> .....	81	Pacific Oceanic Fishery Investigations.....	47, 91, 111
June, Fred C.: SPAWNING OF YELLOWFIN TUNA IN HAWAIIAN WATERS.....	47-64	<i>Pandorina</i> .....	228, 239
<i>John R. Manning</i> , research vessel.....	92, 99, 112	Parvin, J. R., R. R. Rucker, W. J. Whipple, and C. A. Evans: A CONTAGIOUS DISEASE OF SALMON POSSIBLY OF VIRUS ORIGIN.....	35-46
<i>Katsuwonus pelamis</i> .....	98, 99	<i>Penaeus setiferus</i> , shrimp.....	65
King, Joseph E., and Joan Demond: ZOOPLANKTON ABUNDANCE IN THE CENTRAL PACIFIC.....	111-144	Phosphorus, inorganic, in sea water.....	72
King, Joseph E., and John W. Reintjes: FOOD OF YELLOWFIN TUNA IN THE CENTRAL PACIFIC.....	91-110	PHOSPHORUS EXCHANGE IN MARINE PHYTOPLANK- TON, by Theodore R. Rice.....	77-89
<i>Leander</i> , a crustacean, found in yellowfin stomach in Celebes Sea.....	91	Pilchard, British Columbia.....	201, 203
Lake herring.....	1, 7, 10, 22, 32	<i>Platyopocilus maculatus</i> .....	215
Lake trout.....	6, 9, 10, 22, 32	POPULATION HETEROGENEITY IN THE PACIFIC PILCHARD, by Frances E. Felin.....	201-225
Lake Windermere, algal antagonism.....	228	<i>Raja erinacea</i> , common skate.....	147
Leavenworth (Wash.) Station.....	36, 43	Ray, S. M., Albert Collier, A. W. Magnitzky, and Joe O. Bell: EFFECT OF DISSOLVED ORGANIC SUB- STANCES ON OYSTERS.....	167-183
virus disease in young salmon.....	35	Reintjes, John W., and Joseph E. King: FOOD OF YELLOWFIN TUNA IN THE CENTRAL PACIFIC.....	91-110
<i>Leucichthys</i> .....	1	Rice, Theodore R.: BIOTIC INFLUENCES AFFECTING POPULATION GROWTH OF PLANKTONIC ALGAE.....	227-245
<i>Leuresthes tenuis</i> .....	47, 60	Rice, Theodore R.: PHOSPHORUS EXCHANGE IN MARINE PHYTOPLANKTON.....	77-89
Lindner, Milton J.: ESTIMATION OF GROWTH RATE IN ANIMALS BY MARKING EXPERIMENTS.....	65-69	Rucker, R. R., W. J. Whipple, J. R. Parvin, and C. A. Evans: A CONTAGIOUS DISEASE OF SALMON POSSIBLY OF VIRUS ORIGIN.....	35-46
Lunger, George F., Ralph Hile, and Howard J. Buechner: FLUCTUATIONS IN THE FISHERIES OF STATE OF MICHIGAN WATERS OF GREEN BAY.....	1-34	Salmon, disease.....	35
<i>macropterus</i> , <i>Neothunnus</i> .....	47, 91	<i>Salvelinus namaycush</i> , lake trout, Lake Michigan... ..	2
Magnitzky, A. W., Albert Collier, S. M. Ray, and Joe O. Bell: EFFECT OF DISSOLVED ORGANIC SUBSTANCES ON OYSTERS.....	167-185	<i>sapidissima</i> , <i>Alosa</i> .....	187, 199, 247
Marvin, Kenneth T., and Albert W. Collier: STABILIZATION OF THE PHOSPHATE RATIO OF SEA WATER BY FREEZING.....	71-76	San Pedro, pilchard landings.....	203
<i>Mertuiccius bilinearis</i> .....	147	San Francisco, pilchard landings.....	203
Michigan waters, fisheries of Green Bay.....	3	Sardine (pilchard).....	201
<i>Masturus lanceolatus</i> , pointed-tailed ocean sunfish... ..	92	<i>Sardina pilchardus</i> , European, growth data.....	203
<i>Melcor</i> , research vessel.....	112	<i>Sardinops caerulea</i> , Pacific pilchard.....	201
<i>Micropterus dolomieu</i> , black bass.....	96	Scales, determination of age of shad.....	187
Monterey, pilchard landings.....	203	spawning-mark criteria.....	190, 191, 195
<i>mordax</i> , <i>Engraulis</i> , anchovy.....	210	<i>Scenedesmus</i> , planktonic algae.....	228
<i>mordax</i> , <i>Osmerus</i> , smelt.....	2	Sea water, inorganic phosphorus changes.....	72, 75
<i>namaycush</i> , <i>Salvelinus</i> .....	2	<i>Sebastes marinus</i> , ocean perch.....	147
NATURE OF VARIABILITY IN TRAWL CATCHES, by Clyde C. Taylor.....	145-166	Shad, age determination, from scales.....	187-199
<i>Neothunnus macropterus</i> .....	47, 91	Connecticut River shad.....	247-259
		Shrimp tagging experiments, <i>Penaeus setiferus</i> .....	65
		Silver salmon fingerlings, disease.....	38
		Skate, common.....	147
		<i>Skeletonema</i> , planktonic algae.....	228

	Page		Page
Smelt.....	10, 22, 33	Vessels, US FWS research—Continued	
Spanish coast pilchard population.....	203	<i>Albatross III</i> .....	112, 132, 145, 153
SPAWNING OF YELLOWFIN TUNA IN HAWAIIAN		<i>John R. Manning</i> .....	92, 99
WATERS, by Fred C. June.....	47-64	<i>Henry O' Malley</i> .....	92
Spawning mark on shad scales.....	194	<i>Hugh M. Smith</i> .....	92, 104, 105, 112
<i>Sphyraena argentea</i> , barracuda.....	60	<i>virginica</i> , <i>Crassostrea</i> .....	171
Squid, a food of yellowfin tuna.....	91, 98, 106, 108	Virus disease in salmon fingerlings.....	35
Squilla.....	91	<i>vitreum</i> , <i>Stizostedion</i> .....	1
STABILIZATION OF THE PHOSPHATE RATIO OF SEA		Volga-Caspian herrings.....	60
WATER BY FREEZING, by Albert W. Collier and		Walleye.....	1
Kenneth T. Marvin.....	71-76	Whipple, W. J., R. R. Rucker, J. R. Parvin, and	
<i>Stizostedion v. vitreum</i> , walleye or yellow pike-		C. A. Evans: A CONTAGIOUS DISEASE OF SALMON	
perch.....	1	POSSIBLY OF VIRUS ORIGIN.....	35-46
Stomach contents of yellowfin.....	97	Whitefish, lake ( <i>Coregonus clupeaformis</i> ).....	1, 6, 9, 22, 32
Stomatopod larvae.....	98-125	Whiting ( <i>Merluccius bilinearis</i> ).....	147
Sturgeon in Michigan waters.....	3	Winthrop Station, outbreak of virus disease in	
Suckers, white and redborse.....	10, 14, 22	salmon.....	41
Taylor, Clyde C.: NATURE OF VARIABILITY IN		Yellowfin tuna.....	47-64, 91-110, 125
TRAWL CATCHES.....	145-166	Yellow perch.....	3
<i>Trypanosoma equiperdum</i> .....	86	Zooplankton abundance.....	107, 126, 127, 128, 129
Tuna, yellowfin, <i>Neothunnus macropterus</i> .....	47-64, 91-110, 125	ZOOPLANKTON ABUNDANCE IN THE CENTRAL PA-	
Vessels, US FWS research:		CIFIC, by Joseph E. King and Joan Demond.....	111-144
<i>Alaska</i> .....	72		