Notes and References

PART I

Chapter 2

- 1. Figure 2 was adapted from "Study in Human Starvation. 1. Sources of Selected Foods," Plate 8, Atlas of Diseases (New York: American Geographical Society, 1953).
- 2. Figure 3 was adapted from "Study in Human Starvation. 2. Diets and Deficiency Diseases," Plate 9, Atlas of Diseases (New York: American Geographical Society, 1953).
- 3. Figure 4 was adapted from W. S. Woytinsky, and E. S. Woytinsky, World Population and Production (New York: The Twentieth Century Fund, 1953), p. 421.
- 4. Kingsley Davis, "Population and the Further Spread of Industrial Society," Proceedings of the American Philosophical Society, XCV:1 (1951), pp. 8-19.
- 5. Figure 5 was compiled by John Lyman from the 1953 Appendix to Lloyd's Register; the World Almanac (1952); and the Bulletin of the American Bureau of Shipping (October 1953). A number of dependent territories were rated on the basis of personal judgment.
- rated on the basis of personal judgment. 6. Figure 6 was adapted from W. S. Woytinsky, and E. S. Woytinsky, World Commerce and Governments (New York: The Twentieth Century Fund, 1955), p. 317.
- 7. Figure 7 is based on data supplied by the U.S. Navy Hydrographic Office.

Chapter 3

- 1. For the purpose of this model, I assume that it takes five pounds of food to produce one pound of fish flesh, and an additional amount equal to 3 per cent of the body weight, daily, for maintenance. This is a guess, based on data from feeding studies carried on with trout and other species. I have used growth and length-weight data on striped bass as published by Eugene C. Scofield, "A Simple Method of Age Determination of Striped Bass," California Fish and Game XVIII (1932), No. 2, 168-70.
- fornia Fish and Game XVIII (1932), No. 2, 168-70.
 H. W. Jackson and R. E. Tiller, "Preliminary Observations on Spawning Potential in the Striped Bass (Roccus saxatilis Waldbaum)," Publication 93, Chesapeake Biological Laboratory, 1952, 1-16.

Chapter 4

1. Fenner A. Chace, Jr., "The Current Status of the Systematics of Invertebrate Animals other than Insects," Appendix A in Conference on the Importance

297

and Needs of Systematics in Biology (mimeographed; Washington, D.C.: National Academy of Science, National Research Council, 1953), A1-A9.

- 1. John B. Tait, Hydrography in Relation to Fisheries, being the Buckland Lectures for 1938 (London: Edward Arnold, Ltd., 1952).
- 2. California Cooperative Sardine Research Program, Progress Report January 1, 1951 to June 30, 1952.
- Reprinted with permission from Paul Horrer and Roger Revelle, "The Ocean off the California Coast," in Clifford M. Zierer (ed.), California and the Southwest, pp. 80–96. Copyright, 1956, by John Wiley & Sons, Inc.
 Oscar E. Sette, "Consideration of Midocean Fish Production as Related to
- Oscar E. Sette, "Consideration of Midocean Fish Production as Related to Oceanic Circulatory Systems," Sears Foundation Journal of Marine Research XIV (1955), No. 4, 398-414.
 Alfred C. Redfield, "The Effect of the Circulation of Water on the Distribu-
- Alfred C. Redfield, "The Effect of the Circulation of Water on the Distribution of the Calanoid Community in the Gulf of Maine," *Biological Bulletin*, LXXX (1941), 86-110.
- 6. D. Damas, "Notes biologiques sur les copépods de la Mer Norvégienne," Conseil Permanent International Pour l'Exploration de la Mer, Copenhagen, *Publications de Circonstance*, No. 22 (1905).
- 7. Alfred C. Redfield, "The History of a Population of Limacina retroversa During its Drift Across the Gulf of Maine," Biological Bulletin, LXXVI (1939), 26-47.
- 8. R. Spärck, "Fluctuations in the Stock of Oyster (Ostrea edulis) in the Limfjord in Recent Time," Conseil Permanent International Pour l'Exploration de la Mer, Copenhagen, Rapports et Procès-Verbaux des Réunions, CXXVIII, Contributions to special scientific meetings, 1949 (1951), No. 2. 27-29.
- 9. R. E. Savage, "The Influence of *Phaeocystis* on the Migrations of the Herring," British Ministry of Agriculture and Fisheries, *Fishery Investigations*, Series 2, XII (1930), No. 2.
- 10. A. C. Hardy and E. R. Gunther, "The Plankton of the South Georgia Whaling Grounds and Adjacent Waters, 1926-1927," Discovery Reports, XI (1936).
- 11. R. Bainbridge, "Movement of Zooplankton in Diatom Gradients," Nature, CLXIII (1949), 910-11.
- 12. See, for example, F. W. Knörrich, "Studien über die Ernährungsbedingungen einiger für die Fischproduktion wichtiger Mikroorganismen des Süsswassers," Forschungsberichte aus der biologischen Station zu Plön, VIII (1901), 1–52.
- 13. August Krogh, "Dissolved Substances as Food of Aquatic Organisms," Conseil Permanent International Pour l'Exploration de la Mer, Copenhagen, Rapports et Procès-Verbaux des Réunions, LXXV (1931), 7-36.
- 14. H. W. Harvey, "Substances Controlling the Growth of a Diatom," Journal of the Marine Biological Association of the United Kingdom, XXIII (1939), No. 2, 499-520.
- Douglas P. Wilson, "A Biological Difference Between Natural Sea Waters," Journal of the Marine Biological Association of the United Kingdom, XXX (1951), No. 1, 1-19.
- William D. Rosenfeld and Claude E. ZoBell, "Antibiotic Production by Marine Microorganisms," Journal of Bacteriology, LIV (1947), 393-98.
- 17. Bostwick H. Ketchum, Cornelia L. Carey, and Margaret Briggs, "Preliminary Studies on the Viability and Dispersal of Coliform Bacteria in the Sea," *Limnological Aspects of Water Supply and Waste Disposal* (Washington, D.C.: American Association for the Advancement of Science, 1949), pp. 64-73.
- Bostwick H. Ketchum, John C. Ayres, and Ralph F. Vaccaro, "Processes Contributing to the Decrease of Coliform Bacteria in a Tidal Estuary," *Ecology*, XXXIII (1952), 247-58.

- 19. C. E. Lucas, "The Ecological Effects of External Metabolites," *Biological Reviews*, XXII (1947), 270-94.
- 20. Albert Collier, Sammy Ray, and Wayne Magnitzky, "A Preliminary Note on Naturally Occurring Organic Substances in Sea Water Affecting the Feed-ing of Oysters," Science, CXI (1950), No. 2876, 151–52.
- 21. Claude É. ZoBell, Marine Microbiology, A Monograph on Hydrobacteriology (Waltham, Mass.: Chronica Botanica, 1946).
- 22. Gordon A. Riley, Henry Stommel, and Dean F. Bumpus, "Quantitative Ecology of the Plankton of the Western North Atlantic," Bulletin of the Bingham Oceanographic Collection, XII (1949), No. 3, 1-169.

- 1. Harden F. Taylor et al., Survey of Marine Fisheries of North Carolina (Raleigh: University of North Carolina Press, 1951). Martin D. Burkenroad, "Some Principles of Marine Fishery Biology," Publica-
- Identify and the second of the
- 4. F. M. Davis, "Quantitative Studies on the Fauna of the Sea Bottom. No. 1: Preliminary Investigation of the Dogger Bank," British Ministry of Agricul-
- ture and Fisheries, Fishery Investigations, Series 2, VI (1923), No. 2, 1-54.
 5. Erik Ursin, "Change in the Composition of the Bottom Fauna of the Dogger Bank Area," Nature, CLXX (1952), 324.
- Bank Area, Nature, CLAA (1902), 024.
 6. L. Birkett, "Change in the Composition of the Bottom Fauna of the Dogger Bank Area," Nature, CLXXI (1953), 265.
 7. H. Blegvad, "Quantitative Investigations of Bottom Invertebrates in the Lim-
- fjord 1910-1927, with Special Reference to the Plaice-Food," Report of the Danish Biological Station, XXXIV (1928), 33-52. Richard E. Sayles, "The Trash Fishery of Southern New England in 1950,"
- 8. Commerical Fisheries Review, XIII (1951), No. 7, 1-4.

- 1. E. S. Russell, The Behaviour of Animals, an Introduction to Its Study (2d ed.; London: Edward Arnold, Ltd., 1938).
- 2. Ibid.
- Albert L. Tester, Establishing Tuna and Other Pelagic Fishes in Ponds and 3. Tanks, U.S. Fish and Wildlife Service, Special Scientific Report: Fisheries No. 71 (1952).
- 4. P. B. van Weel, "Observations on the Chemoreception of Tuna," Part II of Reaction of Tuna and Other Fish to Stimuli, U.S. Fish and Wildlife Service, Special Scientific Report: Fisheries No. 91 (1952), 8-35.
- 5. Albert L. Tester, Heeny Yuen, and Michio Takata, Reaction of Tuna to Stimuli, 1953, U.S. Fish and Wildlife Service, Special Scientific Report: Fisheries No. 134 (1954), 33; and Albert L. Tester et al., Reaction of Tuna to Stimuli, 1952-53, U.S. Fish and Wildlife Service, Special Scientific Report: Fisheries No. 130 (1955), 1-124.
- 6. Pacific Oceanic Fishery Investigations, Progress in 1954 (Washington, D.C.: U.S. Fish and Wildlife Service, 1955). Prepared for the Tuna Industry Advisory Committee meeting. 7. Sidney C. Hsiao, "Observations on the Reaction of Tuna to Artificial Light,"
- Part III of Reaction of Tunas and Other Fish to Stimuli, 1951, U.S. Fish and
- Wildlife Service, Special Scientific Report: Fisheries No. 91 (1952), 36-58.
 W. N. Kellogg and Robert Kohler, "Reactions of the Porpoise to Ultrasonic Frequencies," Science, CXVI (1952), No. 3010, 250-53.

- 9. Marie Poland Fish, "The Character and Significance of Sound Production Among Fishes of the Western North Atlantic," Bulletin of the Bingham Oceanographic Collection, XIV (1954).
- 10. Yoshio Hiyama, "Underwater Animal Sounds Around Japan," Records of Oceanographic Works in Japan, I, (1954), No. 2, 105–11.
- 11. D. R. Griffin, Underwater Sounds and the Orientation of Marine Animals, a Preliminary Survey, Project NR 162-429, Contract No. ONR 264, t.o.9 between the Office of Naval Research and Cornell University, Technical Report 3 (1950).
- 12. C. M. Breder, Jr., "Studies on the Structure of the Fish School," Bulletin of the American Museum of Natural History, XCVIII (1951), 7-27.
- 13. Ibid.
- 14. I. D. Richardson, "Some Reactions of Pelagic Fish to Light as Recorded by Echo-sounding," Ministry of Agriculture and Fisheries, Fishery Investigations, Series 2, XVIII (London, 1952), No. 1.
- 15. Maurice Ewing, Allyn Vine, and J. L. Worzel, "Photography of the Ocean Bottom," Journal of the Optical Society of America, XXXVI (1946), 307-21.
- H. C. Vevers, "Photography of the Sea Floor," Journal of the Marine Biological Association of the United Kingdom, XXX (1951), 101-11; and Henry G. Vevers, "Animals of the Bottom," Scientific American, July, 1952, p. 68.
- 17. W. C. Allee, Animal Aggregations: A Study in General Sociology (Chicago: University of Chicago Press, 1931).
- 18. H. Barnes, "Underwater Television and Marine Research," Symposium on New Advances in Underwater Observations; British Association for the Advancement of Science, Annual Meeting, Liverpool (1953), 55-61.
- Jacques-Yves Cousteau, "To the Depths of the Sea by Bathyscaphe," National Geographic Magazine, CVI (July, 1954), 67-86.

- 1. W. A. Herdman, "Copepoda as an Article of Food," Nature, XLIV (July 23, 1891), p. 273.
- 2. A. C. Hardy, "Plankton as a Source of Food," Nature, CXLVII (June, 1941), 695-96.
- 3. Thor Heyerdahl, Kon-Tiki (Chicago: Rand McNally & Co., 1950), pp. 138-41.
- 4. Life, May 18, 1953, 115-22.
- 5. Johannes Krey, "Eine neue Methode zur quantitativen Bestimmung des Planktons," Kieler Meeresforschungen, VII (1950), 58-75.
- 6. R. E. Savage and R. S. Wimpenny, "Phytoplankton and the Herring. Part II, 1933 and 1934," British Ministry of Agriculture and Fisheries, Fishery Investigations, Series 2, XV (1936), No. 1; H. A. Spoehr and H. W. Milner, "The Chemical Composition of Chlorella, Effect of Environmental Conditions," Plant Physiology, XXIV (1949), 120–49; and Jul Grøntved, "Investigations on the Phytoplankton in the Southern North Sea in May 1947," Medd. Komm. Danm. Fisk. og Havunders. Plankton, V (1952).
- 7. Personal communication.
- 8. L. R. Fisher, S. K. Kon, and S. Y. Thompson, "Vitamin A and Carotenoids in Certain Invertebrates. I. Marine Crustacea," *Journal of the Marine Biological* Association of the United Kingdom, XXXI (1952), No. 2, 229–58.
- 9. H. Von Witsch, "Wachstum und Vitamin B₁-Gehalt von Süsswasseralgen unter verschiedenen Aussenbedingungen," Naturwissenschaften, XXXIII (1946), No. 7, 221-22.
- 10. H. G. Albaum et al., "Phosphorylated Compounds in Euglena," Archives of Biochemistry and Biophysics, XXIX (1950), No. 1, 210-18.
- G. E. Hutchinson and Jane K. Setlow, "Limnological Studies in Connecticut. VIII. The Niacin Cycle in a Small Inland Lake," *Ecology*, XXVII (1946), 13-22.

- 12. A. Krogh, "Physiology of the Blue Whale," Nature, CXXXIII (1934), 635-37.
- 13. D. H. Cushing, personal communication, 1953.
- 14. George L. Clarke, "Plankton as a Food Source for Man," Science, LXXXIX (1939), 602-3.
- 15. James W. S. Marr, "On the Operation of Large Plankton Nets," Discovery Reports, XVIII (1938), 107-20.
- 16. Philip Jackson, "Engineering and Economic Aspects of Marine Plankton Harvesting," Conseil Permanent International Pour l'Exploration de la Mer, Copenhagen, Journal du Conseil, XX (1954), No. 2, 167-74.
- 17. Personal communication, 1953.
- 18. Philip Jackson, op. cit.

- 1. Fishery Resources of the U.S.A. (Washington, D.C.: U.S. Fish and Wildlife Service, 1945).
- G. Robert Lunz, "A Salt Water Fish Pond," Contributions from Bears Bluff Laboratories (Wadmalaw Island, S.C.), No. 12 (June, 1951), pp. 3-12.
- 3. W. H. Schuster, Fish Culture in Brackish Water Ponds of Java, Indo-Pacific Fisheries Council Special Publication No. 1 (Bangkok: Indo-Pacific Fisheries Council, 1952).
- 4. Tung-pai Chen, Milkfish Culture in Taiwan, Chinese-American Joint Commission on Rural Reconstruction, Fisheries Series: 1 (1952).
- 5. D. F. Hickling, unpublished manuscript (no date).
- 6. W. H. Schuster, Fish Culture in Brackish Water Ponds of Java, Indo-Pacific Fisheries Council Special Publication No. 1 (Bangkok: Indo-Pacific Fisheries Council, 1952), p. 56.
- 7. Fenton Carbine, personal communication, 1956.
- 8. Tung-pai Chen, op. cit., p. 7. 9. B. N. Chopra (ed.), Handbook of Indian Fisheries, prepared for the third meeting of the Indo-Pacific Fisheries Council, Madras, February, 1951.
- 10. "Notes on the Milkfish, Chanos chanos," Indo-Pacific Fisheries Council, Proceedings of the Fourth Meeting (Quezon City, 1952), Section 1, pp. 82-83.

- 1. Nora G. Sproston, "Ichthyosporidium hoferi (Plehn & Mulsow, 1911), an Internal Fungoid Parasite of the Mackerel," Journal of the Marine Biological Association of the United Kingdom, XXVI (1944-47), 72-98.
- 2. Margaret W. Jepps, "On the Protozoan Parasites of Calanus finmarchicus in the Clyde Sea Area," Quarterly Journal of Microscopical Science, LXXIX (1937), 589-655
- 3. R. R. Rucker and P. V. Gustafson, "An Epizootic among Rainbow Trout," Progressive Fish Culturist, XV (1953), No. 4, 179-81.
- 4. Sten Vallin, "Plankton Mortality in the Northern Baltic Caused by a Parasitic Water-Mould," Institute of Freshwater Research, Drottningholm, Annual
- Report for the Year 1950, Report 32 (1951), 139-48.
 5. F. K. Sparrow, Jr., "Biological Observations on the Marine Fungi of Woods Hole Waters," Biological Bulletin, LXX (1936), 236-63.
 6. A. A. Aleem, "Phycomycètes marins parasites de diatomées et d'algues dans la chieve Development (Development), Vie et hilly: Relleting Content (Development).
- la région de Banyuls-sur-Mer (Pyrénées-Orientales)," Vie et Milieu, Bulletin
- du Laboratoire Arago, Université de Paris, I (1950), 421-40.
 7. Charles E. Renn, "The Wasting Disease of Zostera marina," Biological Bulletin, LXX (1936), 148-58.
- James Moffitt and Clarence Cottam, "Eelgrass Depletion on the Pacific Coast and Its Effects upon Black Brant," U.S. Fish and Wildlife Service, Wildlife Leaflet 204 (1941).
- 9. Paul S. Galtsoff, "Wasting Disease Causing Mortality of Sponges in the West

Indies and Gulf of Mexico," Proceedings of the Eighth American Scientific Congress, III (1942), 411-21.

- 10. Claude E. ZoBell, Marine Microbiology (Waltham, Mass.: Chronica Botanica, 1946). Also personal communication, 1953.
- 11. Ross F. Nigrelli, "Cnidosporidiosis in Marine Fishes," unpublished manuscript, 1952
- 12. T. C. Roughley, Fish and Fisheries of Australia (Sydney: Angus & Robertson, Ltd., 1951).
- 13. Rees Davies and E. Beyers, "A Protozoal Disease of South African Trawled Fish and its Routine Detection by Fluorescence," Nature, CLIX (1947), 714. 14. Nigrelli, op. cit.
- 15. R. B. Seymour Sewell, "The Epibionts and Parasites of the Planktonic Copepoda of the Arabian Sea," The John Murray Expedition 1933-34, Scientific Reports, IX (1951), No. 4, 255-394, and Edouard Chatton, "Les péridiniens parasites," Archives de Zoologie Expérimentale et Générale, LIX (1920), 1–475.
- 16. Ross F. Nigrelli, "The Morphology, Cytology, and Life-History of Oodinium ocellatum Brown, a Dinoflagellate Parasite on Marine Fishes," Zoologica, XXI (1936), 129-64. 17. Erling Ordal, personal communication.
- 18. Joseph D. Aronson, "Spontaneous Tuberculosis in Salt Water Fish," Journal of Infectious Diseases, XXXIX (1926), 315-20.
- S. F. Snieszko and C. C. Taylor, "A Bacterial Disease of the Lobster (Homarus Americanus)," Science, CV (1947), 500.
- 20. Nelson A. Wells and Claude E. ZoBell, "Achromobacter ichthyodermis, N. Sp., the Etiological Agent of an Infectious Dermatitis of Certain Marine Fishes. Proceedings of the National Academy of Sciences, XX (1934), 123-26.
- 21. Claude E. ZoBell, personal communication, 1953.
- 22. R. E. Foerster, "The Mortality of Young Pilchards, 1941," Progress Reports (Pacific) of the Fisheries Research Board of Canada, No. 48 (June, 1941), 3-8.
- 23. Thomas S. Thompson, personal communication. 24. Arvid M. Bergman, "Eine ansteckende Augenkrankheit Keratomalacie, bei Dorschen an der Südküste Swedens," Centralblatt für Bakteriologie Parasitenkunde und Infektronskrankheiten, Originale I Abt., LXII (1912), 200-12.
- 25. Arvid M. Bergman, "Die rote Beulenkrankheit des Aals," Berichte aus der
- Kgl. Bayerischen Biologischen Versuchsstation in München, II (1909), 10-54.
 28. Richard Weissenberg, "Studies on Virus Diseases of Fish. I. Lymphocystis Disease of the Orange Filefish (Aleutera schoepfii)," American Journal of Hygiene, XXVIII (1938), 455-62; and Ross F. Nigrelli, "Virus and Tumors in Fishes," Annals of the New York Academy of Sciences, LIV (June, 1952), 1076-92.

- 1. William Arcisz, Ciguatera: Tropical Fish Poisoning, U.S. Fish and Wildlife Service, Special Scientific Report: Fisheries No. 27 (1950); and Bruce W. Halstead, "Some General Considerations of the Problem of Poisonous Fishes and Ichthyosarcotoxism," Copeia (1953), No. 1, 31-33.
- Bruce W. Halstead, "Report of an Investigation of Poisonous and Venomous Fishes at Guam, Saipan, Okinawa and Japan," Office of Naval Research, Contract No. NONR-205(00). (1952) unpublished. Quoted by permission of the Office of Naval Research and the author.
- 3. Arcisz, op. cit.
- Yoshio Hiyama, Report on the Investigation of Poisonous Fishes of the South Seas (Nissan: Fisheries Experiment Station, Odawara Branch, 1943), Translated in U.S. Department of Interior, Fish & Wildlife Service, Special Scientific Report: Fisheries No. 25 (1950).

- 5. Charles J. Fish and Mary Curtis Cobb, Noxious Marine Animals of the Central and Western Pacific Ocean, U.S. Fish and Wildlife Service, Research Report 36 (1954).
- 6. Arcisz, op. cit.
- 7. Hiyama, loc. cit.
- Bruce W. Halstead and W. M. Lively, "Poisonous Fishes and Ichthyosar-cotoxism," U.S. Armed Forces Medical Journal, V (1954), No. 2, 157-75.
 Ross F. Nigrelli, "The Effects of Holothurin on Fish, and Mice with Sarcoma
- 180," Zoologica, XXXVII (1952), 89–90.
 Hermann Sommer et al., "Relation of Paralytic Shell-fish Poison to Certain Plankton Organisms of the Genus Gonyaulax," Archives of Pathology, XXIV (1937), No. 5, 537–59.
- Hermann Sommer and Karl F. Meyer, "Paralytic Shellfish Poisoning," Ar-chives of Pathology, XXIV (1937), No. 5, 560-98.
 Y. Hashimoto, and M. Migita, "On the Shellfish Poisons. I. Inadequacy of Acidulated Alcohols with Hydrochloric Acid as Solvent," Bulletin of Tokai Busiened Ficharia Laboratory (1960), 77 85 and Emeriching Abits. Regional Fisheries Research Laboratory (1952), 77-85; and Tomoichiro Akiba and Yasuzo Hattori, "Food Poisoning Caused by Eating Asari (Venerupis semidecussata) and Oyster (Ostrea gigas) and Studies on the Toxic Substance,
- Venerupin," Japanese Journal of Experimental Medicine, XX (1949), 271-84.
 13. J. C. Medcof et al., "Paralytic Shellfish Poisoning on the Canadian Atlantic Coast," Fisheries Research Board of Canada, Bulletin No. 75 (1947), pp. 1-33.
- 14. James Hornell, "A New Protozoan Cause of Widespread Mortality among Marine Fishes," Madras Fishery Investigations, Bulletin No. 11 (1917), pp. 53-66
- 15. W. J. Copenhagen, "The Periodic Mortality of Fish in the Walvis Region," Union of South Africa, Division of Fisheries, Investigational Report No. 14 (1953), pp. 3-35.
- 16. E. Steeman Nielsen and E. Aabye Jensen, "Primary Oceanic Production: The Autotrophic Production of Organic Matter in the Oceans," Galathea Report I
- 17. Paul S. Galtsoff, "The Mystery of the Red Tide," Scientific Monthly, LXVIII (1949), 109-117.
- 18. S. M. Ray and William B. Wilson, "The Effects of Unialgal and Bacteria-free Cultures of Gymnodinium brevis on Fish, and Notes on Related Studies with Bacteria," U.S. Fish and Wildlife Service, Special Scientific Report: Fisheries No. 211 (1957).
- 19. George A. Emerson and Charles H. Taft, "Pharmacologically Active Agents from the Sea," Texas Reports on Biology and Medicine, III (1945), No. 3, 302-38.

- 1. Raymond Firth, Malay Fishermen: Their Peasant Economy (London: Kegan Paul, Trench. Trubner Co. Ltd., 1946)
- S. B. Setna, "Bombay Fishing Boats," in Fishing Boats of the World (London: Fishing News, Arthur J. Heighway Publications, Ltd., 1955), pp. 17-24. Copyright, 1955, by F.A.O.
- 3. Paul Ziener, "Motorization in Chile," in Fishing Boats of the World, pp. 393-97.
- 4. Firth, op. cit.
- 5. M. Rahimullah Qureshi, Henry Magnusson, and Jan-Olof Traung, "West Pakistan Fishing Craft," in Fishing Boats of the World, pp. 25-50.
- 6. E. George Bergius, Some Aspects of the Motorisation of the Scottish Inshore Fishing Fleet, International Fishing Boat Congress Paper No. 59 (1953).
- 7. B. F. Osorio-Tafall, "Better Utilization of Fisheries Resources in Latin America," F.A.O. Fisheries Bulletin, IV (1951), No. 3, 3-24.

- 8. Hans K. Zimmer, "European Beach Landing Craft," in Fishing Boats of the World, pp. 51-72.
- 9. W. A. P. Van Lammeren, "Tank Testing Technique," in Fishing Boats of the
- World, pp. 269-80.
 10. Jan-Olof Traung, "Improving the Design of Fishing Boats," F.A.O. Fisheries Bulletin IV (1951), Nos. 1-2, 3-27.
- 11. Walter Möckel, "Behavior of Trawlers at Sea," in Fishing Boats of the World, pp. 326–36. 12. "F.A.O. Fisheries Work. Part Two, Section III: Improving Fishing Tech-
- niques," Pan American Fisherman, VII (1953), No. 8, 13-15.
- 13. Zimmer, loc. cit. 14. Ziener, loc. cit.
- 15. James Whittaker, "Vibration in Small Ships," in Fishing Boats of the World, pp. 433–37. 16. Setna, *loc. cit.*
- 17. James F. Petrich, "Operational Influence on Tuna Clippers," in Fishing Boats of the World, pp. 113–17. 18. John Tyrrell, "Irish Fishing Boats," in Fishing Boats of the World, pp. 203–10. 19. H. C. Hanson, "Pacific Combination Fishing Vessels," in Fishing Boats of the
- World, pp. 187-202.
- 20. A. C. Hardy, Speaking in a discussion at the 1954 International Fishing Boat Congress, in Fishing Boats of the World, p. 251. 21. In a discussion at the 1954 International Fishing Boat Congress held under
- the auspices of F.A.O., in Fishing Boats of the World, p. 242.
- 22. In a discussion at the 1954 International Fishing Boat Congress, in Fishing Boats of the World, p. 248.
- 23. W. Zwolsman, "Dutch Coastal Fishing Boats," in Fishing Boats of the World, pp. 154-65.
- 24. Setna, loc. cit.
- 25. Joaquim Gormicho Boavida, "Small Fishing Boats in Portugal," in Fishing Boats of the World, pp. 73-79.
- 26. See William Bridges, "Fishing with Electricity," Animal Kingdom, New York Zoological Society, LV (1952), 13-15; and P. F. Meyer, "Ein Neuartiges Impulsgerat fur die Elektrofischerei," Der Fischwirt, III (1951), 3-7.
- 27. W. Dickson, "Marine Electrical Fishing," World Fishing, III (1954), No. 4, 148-51.
- 28. C. Beever, "Economic Influence on Design of Fishing Craft," in Fishing Boats of the World, pp. 234-37.

PART II

- 1. Yearbook of Fishery Statistics, 1954-55: Production and Craft (Rome: Food
- and Agriculture Organization of the United Nations, 1956). John F. Storr, "The Sponge Industry of Florida," State of Florida Board of Conservation, Educational Series 9 (1957).
- 3. Paul S. Galtsoff, "Wasting Disease Causing Mortality of Sponges in the West Indies and Gulf of Mexico," Proceedings of the Eighth American Scientific Congress, III (1940), 411-21.
- 4. A. R. Cahn, Japanese Sponge Culture Experiments in the South Pacific
- *Islands,* U.S. Fish and Wildlife Service, Fishery Leaflet 309 (1948). Werner Bergmann and Robert J. Feeney, "Contributions to the Study of Marine Products. XXXII. The Nucleosides of Sponges I," *Journal of Organic* Chemistry, XVI (1951), No. 6, 981-87.

- 6. Werner Bergmann and William J. McAleer, "The Isolation of Metanethole from the Sponge, Spheciospongia vesparia," Journal of the American Chemical Society, LXXIII (1951), No. 10, 4969.
- 7. Werner Bergmann, Harold P. Schedl, and Eva M. Low, "Contributions to the Study of Marine Products. XIX. Chalinasterol," Journal of Organic Chemistry, X (1945), No. 6, 587-93.
- 8. Werner Bergmann and Abbot N. Swift, "Contributions to the Study of Marine Products. XXX. Component Acids of Lipids of Sponges I," Journal of Organic Chemistry, XVI (1951), No. 8, 1206-21.
- 9. Takeo Imai, Masayoshi Hatanaka, Ryuhei Sato, and Seiichi Sakai, "Ecology of Mangoku-Ura Inlet with Special Reference to the Seed-Oyster Production, Science Reports, Research Institute, Tohoku University, Vol. D 1-2 (1951), No. 1-2, 137-55.
- 10. Austin H. Clark, "Echinoderms from the Cocos-Keeling Islands," Bulletin of the Raffles Museum (Singapore), No. 22 (1950), 53-67.
- 11. Imai et al., op. cit.
- 12. Torbjørn Gaarder and E. Alvasker, Biology and Chemistry of the Oyster in Norwegian Waters, Naturvitenskapelig Rekke, Bergen Museum Yearbook, 1941, No. 6.
- 13. A. Larbalétrier, Manuel pratique d'ostreiculture et de myticulture (Paris: Encyclopédie Roret, 1901).
- 14. A. R. Cahn, Pearl Culture in Japan, General Headquarters, Supreme Commander for the Allied Powers, Natural Resources Section, Report No. 122 (1949).
- 15. R. Tucker Abbot, "Handbook of Medically Important Mollusks of the Orient and the Western Pacific," Bulletin of the Museum of Comparative Zoology, C, Harvard University (1948), No. 3, 245-328.
- 16. L. A. Walford, Notes on Shrimp Fishing along the New England Coast, U.S. Fish and Wildlife Service, Fishery Leaflet 318 (1948).
- 17. Clarence P. Idyll, Report on the Newly Developed Key West Shrimp Fishery, Report to the Florida State Board of Conservation from the University of Miami Laboratory, Coral Gables, Fla. (1950).
- 18. Theodor Ernst and Hans Hörmann, "Bestimmung von Vanadium, Nickel, und Molybdän in Meerwasser," Nachrichten von der Gesellschaft der Wissenschaften zu Göttingen, Math.-Phys., I (1936), No. 16, 205-8.

- 1. Anton F. Bruun (ed.), The Galathea Deep Sea Expedition 1950-1952 (New York: The Macmillan Co., 1956).
- 2. George S. Myers, "The Fish Fauna of the Pacific Ocean, with Especial Reference to Zoogeographical Regions and Distribution as They Affect the International Aspects of the Fisheries," Proceedings of the Sixth Pacific Science Congress, III (1941), 201-10.
- 3. M. J. Dunbar, "Eastern Arctic Waters," Fisheries Research Board of Canada, Bulletin No. 88 (1951), pp. 109-10. Vernon Brock, "A Preliminary Report on a Method of Estimating Reef Fish
- 4.
- Populations," Journal of Wildlife Management, XVIII (1954), No. 3, 297-308. Leonard P. Schultz, "The Biology of Bikini Atoll with Special Reference to the Fishes," Annual Report of the Smithsonian Institution for 1947, pp. 301-
- 6. George S. Myers, op. cit.

Chapter 15

1. Fred R. Cagle, "An Outline for the Study of a Reptile Life History," Tulane Studies in Zoology (Tulane University) I (1953), No. 3, 31-52.

Chapter 16

- 1. Johan T. Ruud, "Modern Whaling and Its Prospects," F.A.O. Fisheries Bul-
- Johan T. Huddi, Modelli Whaning and His Hospeels, "File: Fisheries Bul-letin, V (1952), No. 5, 165-83.
 Mogens Kondrup, "Whale Meat, a Potential Protein Food Resource," F.A.O. Fisheries Bulletin, V (1952), No. 5, 184-89.
 Edward A. Preble, "Mammals of The Pribilof Islands," North American Fauna, North American Fa
- No. 46 (1923), 102-28.
- 4. Karl W. Kenyon and Victor B. Scheffer, "The Seals, Sea Lions and Sea Otter of the Pacific Coast," U.S. Fish and Wildlife Circular 32 (April, 1955).
- 5. H. D. Fisher, Harp Seals of the Northwest Atlantic, Fisheries Research Board of Canada, Atlantic Biological Station, General Series: 20 (September, 1952).
- 6. Jay Williams, Fall of the Sparrow (New York: Oxford University Press, 1951).

- 1. Anwar Abdel Aleem, "A Quantitative Study of the Benthic Communities Inhabiting the Kelp Beds off the California Coast, with a Self-contained Diving Apparatus," Second International Seaweed Symposium, Held in Trondheim, July 1955 (London: Pergamon Press, Ltd., 1956), pp. 149–52. W. D. Richardson and F. T. Walker, "Perennial Changes of Laminaria
- 2. W. D. Richardson and F. T. Walker, "Perennial Changes of Laminaria cloustoni Edm. [L. hyperborea (Gunn.) Fosl.] around Scotland," Second International Seaweed Symposium, 1956, pp. 203-9.
- 3. Albert Eide Parr, "Quantitative Observations on the Pelagic Sargassum Vegetation of the Western North Atlantic," Bulletin of the Bingham Oceanographic Collection, VI (1939), 1-94.
- 4. Constance I. MacFarlane, "Studies in Seaweed Populations of Economic Importance in Digby Neck Area, Nova Scotia," Second International Seaweed Symposium, 1956, 186-91.
- 5. S. M. Marshall, L. Newton and A. P. Orr, "A Study of Certain British Seaweeds and Their Utilization in the Preparation of Agar" (London, Ministry of Health and The Ministry of Supply, 1949). See also Hugo W. Nilson and Joseph W. Schaller, "The Nutritive Value of Agar and Irish Moss Used as Stabilizers in Foods," paper read before American Chemical Society, Detroit, Michigan, September 12, 1950.
- 6. V. J. Chapman, Seaweeds and Their Uses (New York: Pitman Publishing Corp., 1949).
- 7. E. J. Ferguson Wood, Fisheries Technical Service to Industry: Technology in Japan, Australian Scientific and Technical Missions No. [641 (no date).
- 8. Ibid.
- 9. Mitsuzo Takagi, "Chemical Studies on the Seaweeds," Bulletin of the Faculty
- 9. Millsdzo Takagi, Chemical Staties on the Seaweeds, Buttern of the Facung of Fishes, Hokkaido University (Hokodate, Japan), I (1950), No. 1, 35-43; I (1950), No. 2, 77-80; II (1951), No. 1, 31-42.
 10. W. A. P. Black and R. L. Mitchell, "Trace Elements in the Common Brown Algae and in Sea Water," Journal of the Marine Biological Association of the United Kingdom, XXX (1952), No. 3, 575-84.
- 11. A. Høygaard and H. W. Rasmussen, "Vitamin C Sources in Eskimo Food,"
- Nature, CXLIII (1939), 943.
 12. W. A. P. Black, "Seaweed as a Stockfood," Agriculture: the Journal of the Ministry of Agriculture (London, England), LX (1953), 126-30.
- 13. "Expansion of Seaweed Products Planned (Norway)," Commercial Fisheries Review, XII (1950), No. 1, 48-49.
- 14. J. H. Quastel and D. M. Webley, "The Effects of the Addition to the Soil of Alginic Acid and of Other Forms of Organic Matter on Soil Aeration," *Journal* of Agricultural Science (Cambridge, England), XXXVII (1947), 257-66.

- 15. Robertson Pratt et al., "Report on Antibiotic Activity of Seaweed Extracts," Journal of the American Pharmaceutical Association, XL (1947), No. 11, 575-79.
- 16. C. G. C. Chesters and J. A. Stott, "The Production of Antibiotic Substances by Seaweeds," Second International Seaweed Symposium, 1956, 49-54.
- 17. Donald K. Tressler, Marine Products of Commerce (2d ed; New York: Reinhold Publishing Corp., 1951). 18. D. R. Hoagland, "Organic Constituents of Pacific Coast Kelps," Journal of
- Agricultural Research, IV (1915), 39-58.
- 19. J. B. Speakman and N. H. Chamberlin, Journal of the Society of Dyers and Colourists (Bradford, England), LX (1944), 264-72. 20. Ross Aiken Gortner et al., Outlines of Biochemistry (New York: John Wiley &
- Sons, Inc., 1949).
- 21. S. M. Marshall and A. P. Orr, "The Artificial Culture of Marine Algae," in Lily Newton (ed.), Seaweed Utilization (London: Sampson Low, Marston & Co., Ltd., 1951).
- 22. R. H. McDowell, Alginic Acid and Its Derivatives (London: Alginate Industries, Ltd., no date), pp. 1–16. 23. Kathleen M. Drew, "Rhodophyta," in Gilbert M. Smith (ed.), Manual of
- Phycology (Waltham, Mass.: Chronica Botanica, 1951), pp. 167-91.

Looking Forward

- Lionel A. Walford and Charles G. Wilber, "The Sea as a Potential Source of Protein Food," in Advances in Protein Chemistry (New York: Academic Press, Inc., 1955), pp. 209-316.
 Charles Haskins Townsend, "The Distribution of Certain Whales as Shown
- by Log Book Records of American Whaleships," Zoologica, XIX (1935), No. 1, 1-50.