The
Washington Historical Quarterly

HISTORY OF FISHERIES IN THE STATE OF WASHINGTON*

Explorations, Surveys, etc.

As early as 1858, Dr. George Suckley, U.S.A., read a paper entitled "Description of Several New Species of Salmonidae from the Northwest Coast of America," before the Lyceum of Natural History in New York, and this was published by the Society in 1862. The data, undoubtedly, comprised a portion of the material collected by Dr. J. G. Cooper and himself, in connection with the *Explorations and Surveys to Ascertain the Most Practicable and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean,* between the 36th and 49th parallels of latitudes, or the survey of what is now known as the Northern Pacific Railroad route. The full report on the zoology of the Survey was published by Congress in 1860. One new species, *Salmo masoni,* is described.

Dr. Suckley, in 1861, also read before the New York Lyceum of Natural History a paper on certain new species of North American Salmonidae, chiefly in the collection of the Northwest Boundary Commission. Seven new species are listed.

The first systematic researches bearing upon the economic marine fishes of the western coast of North America were conducted in 1879 and 1880, by Dr. David Starr Jordan and the late Dr. Charles H. Gilbert, for Washington, Oregon, and California, and by Dr. Tarleton H. Bean, for Alaska. Not having suitable facilities for investigating the fishing grounds, the work of these naturalists was chiefly limited to collecting and studying the fishes obtainable along the shores and from the fishermen, but, nevertheless, exceedingly important results were accomplished by them. These have been published in the reports of the United States Fish Commission and in the Proceedings of the United States National Museum, the series of volumes entitled the *Fisheries and*

*John N. Cobb, Dean of the College of Fisheries, University of Washington, contributes this third article in the series devoted to the "History of Science in the State of Washington. The other articles were "Hydro-Electric Power in Washington," by Dean C. Edward Magnusson, in April, 1928; and "History of Geology in the State of Washington," by Dean Henry Landes, in October, 1928.

Fishery Industries of the United States, containing full accounts of their observations relative to fishery matters, as well as a complete review of this entire subject, down to 1882.

In 1888, the United States Fisheries Steamer *Albatross* reached the Pacific Coast and immediately began her extremely valuable explorations and investigations of the fishes and fisheries of this coast. Beginning with the *Bulletin* for 1888, Vol. VIII, and continuing thereafter, appear numerous reports, much of which are devoted to the Territory and later State of Washington. Captain Z. L. Tanner, United States Navy, was commander of the vessel for a number of years and was directly in charge of the scientific investigations until shortly before his retirement.

The last work of any consequence, done by the *Albatross* on the Washington Coast, was in 1914 and 1915, when a survey of the fishing grounds along the coast was made by Waldo L. Schmidt, E. P. Johnston, E. P. Rankin and Edward Driscoll.

The Bureau also carried on various investigations throughout the State of Washington, most of which were localized in the Columbia River Valley and related mainly to to the salmon. The first of these, by the late Dr. C. H. Gilbert and Dr. B. W. Evermann, was published in 1894. In 1895, a preliminary report upon salmon investigations in Idaho the preceding year was published by Dr. Evermann, while the following year the final and complete report of the investigation was made.

In 1896, Dr. Evermann and Dr. Seth Eugene Meek made a detailed investigation of the salmon in the Columbia River basin and elsewhere on the Pacific Coast, the results appearing in the 1897 *Bulletin.*

In the annual report of the Bureau for 1899 appears "A review of the Fisheries in the Contiguous Waters of the State of Washington and British Columbia," by Richard Rathbun, the American member of an International Fisheries Commission, appointed to investigate the fisheries in the boundary waters between Canada and the United States.

Individual Investigators, etc.

One of the earliest of these was James G. Swan, well known in connection with the early history of the Territory. He was the author of *The Northwest Coast, or, Three Years' Residence in Washington Territory,* published in 1857, which contains many popular notices of fishes, especially salmon and fishing for salmon. Judge Swan had a long career in the Territory of his adoption,

and was the author of a number of interesting economic and scientific reports on Washington fishes, notably the Surf Smelt, the Eulachon or Candle-fish, the Black Cod, etc. He also wrote on the fisheries and the fishery industries of Puget Sound, the fur-seal industry of Cape Flattery and vicinity, and on investigations at Neah Bay respecting the habits of fur seals of the vicinity, and arranged for procuring specimens of skeltons of Cetacea. All except his book were published either in the reports of the United States Fish Commission or in the Proceedings of the United States National Museum.

Charles Bendire, United States Army, in 1881, collected a number of fish in Oregon and the Territory of Washington, and these were identified and described by Dr. T. H. Bean, and the results were published in the *Proceedings of the United States National Museum* for 1882.

Miss Rosa Smith, later Mrs. Carl H. Eigenmann, (published 1882), Dr. E. C. Starks (1895), Alvin Seale (1896), Seth E. Meek (1897), Prof. Trevor Kincaid, Prof. Donald R. Crawford, Dr. E. Victor Smith, Dr. Carl E. Hubbs, Leonard P. Schultz and a number of others, have assisted in the labor of collecting and identifying the now known species of Washington fishes.

At the instance of the United States Bureau of Fisheries, Dr. C. W. Greene, of the University of Missouri, carried on a series of physiological studies of the Chinook salmon of the Columbia River, between 1904 and 1913, and these represent practically the only work done along this line on the Pacific salmon.

The migrations of Pacific salmon have been of absorbing interest to scientists, and much work along this line has been accomplished. Much of this has been done in Washington waters, and among the many observers might be mentioned Dr. David Starr Jordan, the late Dr. Charles H. Gilbert, Dr. B. W. Evermann, Dr. C. W. Greene, Dr. Willis H. Rich, and Henry O'Malley, United States Commissioner of Fisheries.

The need of a comprehensive work covering the economic, scientific fish cultural and historical, aspects of the salmon of the Pacific Coast has been recognized from early time, and spasmodic attempts were made by various persons to cover in part certain restricted sections, but it was not until 1910 that a serious attempt along these lines was attempted. In that year, the author, who was then connected with the United States Bureau of Fisheries, prepared and the Bureau published a bulletin entitled *The Salmon*

Fisheries of the Pacific Coast. In 1916, a second and revised edition, entitled *Pacific Salmon Fisheries,* was issued. The third revised edition was issued in 1921, and comprised 268 pages. Work is now under way looking toward a fourth revised edition to appear in 1929.

The author had intended to do the same for the leading fisheries of the Coast, but pressure of other matters prevented other than the preparation and publication by the Bureau, in 1915, of *Pacific Cod Fisheries,* and a second and revised edition of the same in 1927.

Both of the above works devote much space to the salmon and cod fisheries of the State of Washington.

State Supervision of Fisheries

That the people of Washington were alive to the need for controlling our fisheries is manifested by the fact that, on January 31, 1856, the Territorial Legislature passed an act authorizing county commissioners to appoint an Inspector of Salmon, chiefly for the purpose of seeing that salmon were prepared properly for export.

The first state-wide commission to control our fisheries was authorized by a law approved November 6, 1877.

In 1893, the legislature established a hatchery fund which was to be supplied by license fees obtained from the industry, and, in 1895, built its first hatchery on the Kalama River, a tributary of the Columbia.

From this time on hatcheries, mainly for salmonoid fishes, were constructed and operated in various waters of the State. the number in operation in 1928 being forty-eight.

Practically, from the beginning, there has been dual control of our game fishes—by the State and by Game Commissions in each county—and single control by the State of the food fisheries.

Until within recent years, the State Fish Commission have devoted but little attention to scientific investigation of our fishes and fisheries. Since 1914, when Commissioner L. H. Darwin began it, various biologists of the University have been called upon for aid, and, about five years ago, a biologist was regularly employed.

Marine Biological Station

In 1902, Professor Trevor Kincaid, head of the Zoology Department, selected a site for a Marine Biological Station for the

University of Washington, at Friday Harbor, in the San Juan Islands, for educational and research purposes. The next year a start was made in teaching and facilities were gradually expanded so that more and more students and research workers could be accommodated. In 1913, Dr. T. C. Frye, head of the Botany Department, succeeded Professor Kincaid as director. As time passed and the demands on the station increased, this location was found to be too restricted and inconvenient, and, in 1924, a new site was obtained from the federal government, at the east side of the entrance to Friday Harbor, and about a mile from the old location. An entirely new station of a most modern character has now been created here.

The waters adjacent to the station teem with a great variety of aquatic life, probably the greatest variety found near any one point on the coast, and thus lends itself readily to teaching and research. An eight weeks session is held each summer, beginning about the middle of June and ending late in August, while it is open a little longer for research workers. It is hoped, in time, to keep the station open all the year around.

College of Fisheries

The College of Fisheries was etablished at the University of Washington, Seattle, in the spring of 1919, and since then has occupied a very prominent position in all lines of fishery science.

In 1920, at the request of Mr. Leslie H. Darwin, then State Fish Commissioner, a beginning was made in a contemplated biological survey of the aquatic resources of the State, the work being initiated under the direction of Professor John N. Cobb, Dean of the College of Fisheries. The work was continued for three seasons, in the tributaries on the eastern side of Puget Sound, with an occasional trip into other sections of the State, when it was suspended, primarily on account of lack of funds. Most of the field work was done by Assistant Professor Donald R. Crawford and Clarence Lucas, a student.

The chief research work of the College has been, however, along the lines of a better and safer utilization of our fishery resources, especially of canned goods.

As a result of the research work carried on by the faculty in the College's laboratories, and in collaboration with the indefatigable research workers of the National Canners Association's Pacific Branch laboratory, in Seattle, important advances have been made in solving the many problems which faced our salmon can-

ners, so much so that this is now one of the safest and best packs of canned fish made in the country.

Much attention was devoted in the college laboratories to the working out of processes for the commercial utilization of various hitherto unutilized, or sparingly used, aquatic products. Some 45 species have already been worked with, and not only has the problem of their suitability for canning been attacked, but they have been exhaustively tested as to their availability when smoked, dehydrated, pickled, or dry-salted.

A beginning has been made in the great problems in standardization of our fish-hatching methods, together with feeding the hordes of fish hatched.

Dr. John E. Guberlet, the College's fish pathologist, has done much work in study of the diseases which beset our fishes, both in hatcheries and open waters. Most of these diseases are of a parasitic origin and do hundreds of thousands of dollars damage each year. The results appear in our published bulletins.

Goiter is a widely prevalent disease in the Pacific Northwest, more especially in the mountain sections. Since goiter is acknowledged to be an iodine deficiency disease, this deficiency may be supplied by first, diet, or, second, the addition of iodides to the drinking water or table salt. Various vegetables, fruits, and cereals, milk, eggs, and meat, contain iodine. The researches of Tressler and Wells on fishes of the Atlantic seaboard show that many of them have high iodine content. Research along this line was begun in the College laboratories by Clarence T. Parks and Norman D. Jarvis about two years ago and three bulletins containing the results obtained from Pacific Coast aquatic plants and animals have been published. These show clearly that the deficiency of iodine may be made up easily by eating saltwater animals and plants.

The author has devoted much time to the problem of getting our anadromus schools of salmon and steelhead trout by mechanical means over the enormously high hydro-electric dams now becoming common in our rivers. One of these dams has a height of 300 feet. A device and method has been worked out that will work in about 75 per cent of these installations, if proper precautions are taken.

National Canners Association Laboratory

Early in 1919, the Association of Pacific Fisheries, an organization of salmon canners operating on the Pacific Coast, arranged

with the National Canners Association for the establishment in Seattle of a branch laboratory, primarily for work upon salmon problems. Dr. E. D. Clark was appointed as director of it, with Dr. R. W. Clough as chemist, Dr. C. R. Fellers as bacteriologist and O. E. Shostrom as assistant. The facilities of the laboratory have been largely centered upon the canned salmon industry, although considerable has been done for the canned fruit and vegetable industry. Since its establishment some 27 publications have emanated from the laboratory, and some of these rank high in the annals of scientific fish preservation. In fact, I feel that I am justified in saying that this laboratory has done more to put salmon canning upon a scientific basis than any other one agency.

International Fisheries Commission

The second most important fishery prosecuted by Washington fishermen is that for halibut. It began here in 1888 and was prosecuted so vigorously that its condition became a cause of concern some few years ago. October 21, 1924, a treaty between Canada and the United States, for preservation of the halibut fishery of the Northern Pacific Ocean, including Behring Sea, was ratified. The treaty provided an entire cessation of halibut fishing for three months each year. It also provided for the appointment of an International Fisheries Commission, the duties of which were to make recommendations regarding the need for modification of the close season, to make a thorough investigation into the life history of the Pacific halibut and to make recormendations as to the regulation of the fishery that may be deemed desirable for its preservation and development. The following were appointed as members of the Commission: John P. Babcock, Assistant to the Minister of Fisheries, British Columbia; Wm. A. Found, Deputy Minister of Fisheries, Dominion of Canada; Henry O'Malley, United States Commissioner of Fisheries, and Mr. Miller Freeman, of Seattle. The Commission selected the well-known biologist, W. F. Thompson, as Director of Investigations. The Commission also selected the following members to serve as an honorary scientific council: Dr. C. McLean Fraser, Professor of Zoology in the University of British Columbia, Vancouver, B.C.; Dr. W. A. Clemens, Director of the Marine Biological Station at Nanaimo, B.C.; Mr. N. B. Scofield, head of the Department of Commercial Fisheries of the Fish and Game Commission of California, and Professor John N. Cobb, Dean of the College of Fisheries of the University of Washington, Se-

attle. The headquarters of the Commission and the Director of Investigations are in the College of Fisheries, Seattle.

Introduction of New Species

There are few subjects connected with the utilization of our natural resources that present greater interest than the possibilities for the successful transfer of useful animals from one section of the country to another and their acclimatization in new regions. In the early days, only the benefits that might accrue to a community or section were considered, but bitter experience in connection with the introduction of certain new species has taught us to use extreme care in such operations.

That our Territorial Legislature was early very much interested in this work is attested by an act passed by it in 1865, which gave C. C. Terry and Joseph Cushman the right to introduce into and stock waters of lakes Washington and Union, at Seattle, with shad and alewives, with the exclusive privilege for thirty years of taking all these fish in these lakes and their tributaries and outlets, provided the lakes should be stocked within five years. This law was modified in 1869 by substituting the name of Frank Matthias for that of Terry, by the addition of whitefish, and by extending the time for planting, and also making the grant thirty years from that time. As no effort was made to stock the lakes with these fish, the rights lapsed.

The following aquatic species have been introduced into our waters with more or less success: The white catfish (*Ameiurus catus*) the yellow catfish or bullhead (*A. nebulosus*), and the spotted catfish (*Ictalarus punctatus*); Asiatic carp (*Cyprinus carpio*), tench (*Tinca tinca*); goldfish (*Carassius auratus*), shad (*Clupea sapidissima*), the common whitefish (*Coregonus clupeiformis*), Atlantic salmon (*Salmo salar*), landlocked salmon (*Salmo salar sebago*), Von Behr trout (*Salmo fario*), Loch Leven trout (*Salmo trutta levenensis*), lake trout (*Salvelinus namaycush*), eastern brook trout (*Salvelinus fontinalis*), the pike-like species, Crappy (*Pomoxis annularis*), strawberry bass (*P. sparoides*), warmouth bass (*Chaenobryttus gulosus*), green sunfish (*Lepomis cyanellus*), blue-gill sunfish (*L. pallidus*), large-mouth black bass (*Micropterus salmoides*) and small-mouth black bass (*M. dolomieu*), yellow perch (*Perca flavescens*), ayu (.....), lobster (*Homarus americanus*), the soft clam (*Mya arenaria*), frogs, etc., etc.

A number of Washington species have also been sent to other state and foreign waters.

The Oyster Industry

The taking and marketing of the native oyster (*Ostrea lurida*) began around the 50's, in Willapa Harbor, or Shoalwater Bay, as it was then called, in Washington. In 1861, the Territorial Legislature enacted a comprehensive law encouraging the cultivation of oysters. As the native oysters declined in numbers, in our waters, efforts were made by various persons to introduce the eastern oyster. In 1894, the United States Fish Commission sent a carload of eastern oysters to Willapa Bay, and these were planted near Bay Center. As time went on, other consignments were brought until, eventually, it became a considerable industry in Willapa Harbor and Puget Sound. In 1900, the Legislature appropriated $10,000.00 for a study of the eastern oyster and Prof. R. W. Doane, or Washington State College, was entrusted with the work. An experimental station was established at Keyport Landing, on Puget Sound and work carried on here until the exhaustion of the appropriation, a period of about two years, when, as the succeeding legislature failed to provide funds for the work, the station was shut down.

Around about 1910, small lots of mature Japanese oysters were introduced into the waters of Willapa Harbor and Puget Sound. It was taken up as a regular business about 1914 and seed oysters mainly were brought in from this time on.

In 1914, it was discovered that eastern oysters, in the southern section of Willapa Harbor, at the mouth of the Nasel River, were breeding, some of the oysters being several years of age.

Prof. Trevor Kincaid, of the University of Washington, who had been specializing in the scientific study of the oysters of Washington, for some time, took up the matter of the introduction of the western spawned species, a small plantation being established in Oyster Bay, near Olympia, in the summer of 1914, but without any material success. He also subsequently carried out extensive experiments on the Japanese and local oysters.

In 1928, the United States Bureau of Fisheries entered this field and Dr. P. S. Galtsoff and Mr. H. C. McMillin made a reconnoissance of the oyster grounds of the State, preliminary to Mr. McMillin entering upon an extensive investigation early in 1929.

JOHN N. COBB.