

# John Nathan Cobb (1868–1930): Founding Director of the College of Fisheries, University of Washington, Seattle

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## Introduction

John Nathan Cobb (1868–1930), author, naturalist, conservationist, and canneryman (Fig. 1), was one of the last of a breed of men who attained a high position in academia without the benefit of a college education.<sup>1</sup> In a career that began as a printer's aide for a newspaper, he worked as a stenographer and clerk, a

<sup>1</sup> Cobb was listed as "author, naturalist" in *Who was Who in America, 1897–1942* (Anonymous, 1943). Joanne C. Webb described Cobb as a "conservationist and canneryman" in an analysis of Cobb's career. Webb, J. C. 1986. John N. Cobb: Conservationist and canneryman. Unpubl. B.A. Thesis, Scripps College, Calif., 95 p. Hayes (1959) discussed the development of the "conservation" movement in the early 20th century.

newspaper reporter, a "Field Agent" for the U.S. Fish Commission (USFC) and its successor, the U.S. Bureau of Fisheries, as an editor for a commercial fishing trade magazine of the Pacific Northwest, and as a supervisor for companies in the commercial fishing industry. In 1919, Cobb was appointed the founding director of the College of Fisheries at the University of Washington (U.W.),

the first such college established in the United States.

Thus, through self-education, hard work, and ambition, Cobb rose from unpretentious beginnings to become a dean in a major university. Cobb's career was testimony not only to the democratic ideals of the United States, but it also was evidence of his competence and an affirmation of the high level of esteem in which he was held by his peers. He excelled in knowledge of the commercial fisheries industry.

Cobb's tenure as director (later, dean) of the College of Fisheries from 1919 to 1930 must be considered success-

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*ABSTRACT—John Nathan Cobb (1868–1930) became the founding Director of the College of Fisheries, University of Washington, Seattle, in 1919 without the benefit of a college education. An inquisitive and ambitious man, he began his career in the newspaper business and was introduced to commercial fisheries when he joined the U.S. Fish Commission (USFC) in 1895 as a clerk, and he was soon promoted to a "Field Agent" in the Division of Statistics, Washington, D.C. During the next 17 years, Cobb surveyed commercial fisheries from Maine to Florida, Hawaii, the Pacific Northwest, and Alaska for the USFC and its successor, the U.S. Bureau of Fisheries. In 1913, he became editor of the prominent west coast trade magazine, *Pacific Fisherman*, of Seattle, Wash., where he became known as a leading expert on the fisheries of the Pacific Northwest. He soon joined the campaign, led by his employer, to establish the nation's first fisheries school at the University of Washington. After a brief interlude (1917–1918) with the Alaska Packers Association in San Francisco, Calif., he was chosen as the School's founding direc-*

*tor in 1919. Reflecting his experience and mindset, as well as the University's apparent initial desire, Cobb established the College of Fisheries primarily as a training ground for those interested in applied aspects of the commercial fishing industry. Cobb attracted sufficient students, was a vigorous spokesman for the College, and had ambitions plans for expansion of the school's faculty and facilities. He became aware that the College was not held in high esteem by his faculty colleagues or by the University administration because of the school's failure to emphasize scholastic achievement, and he attempted to correct this deficiency. Cobb became ill with heart problems in 1929 and died on 13 January 1930. The University soon thereafter dissolved the College and dismissed all but one of its faculty. A Department of Fisheries, in the College of Science, was then established in 1930 and was led by William Francis Thompson (1888–1965), who emphasized basic science and fishery biology. The latter format continues to the present in the Department's successor, The School of Aquatic and Fishery Sciences.*



Figure 1.—John Nathan Cobb [ca. 1918]. University of Washington Archives, U.W. 18608.

ful, based upon the number of students enrolled in the College as well as in the records of attainment of its graduates. Cobb's approach to the educational focus of the College reflected his experience and mind-set, focusing on the practical applied aspects of the commercial fishing industry. Initially, this approach was also that favored by the University administration.

By the time of his death in 1930, however, it became apparent that his educational philosophy was out of date and was not accepted by the new University administration because of the College's failure to emphasize scholarly achievement. This was demonstrated by the rapid termination of the College by the U.W. administration upon Cobb's passing in 1930 (Stickney, 1989).

Cobb became a well-known "professional" naturalist of his day and his reputation was based on his keen knowledge of the commercial fisheries industry which was reflected in his many publications. He was a skilled compiler of fisheries catch statistics, and he produced well-received books on the fisheries of both Pacific salmon, *Oncorhynchus* spp., and Pacific cod, *Gadus macrocephalus*. Cobb's position as Dean of the College of Fisheries at the University of Washington emphasized his role as a leading national expert on fisheries.

This account describes Cobb's career and his ascendancy in 1919 to the directorship of the newly founded College of Fisheries at the U.W. I first provide a sketch of his professional life as naturalist, author, and "canneryman," and then outline the "campaign" to establish a school of fisheries at the U.W. as well as Cobb's appointment to it as the founding director. Cobb's educational goals are presented, as are his nascent ventures into research on the passage of fish over high dams. I examine the success of the College during its first decade of existence and describe its demise upon Cobb's death. Briefly noted is the school's reemergence in late 1930 as a school dedicated to the newly developing profession of fisheries science.

This work is based primarily on the papers of John N. Cobb housed in the Manuscripts, Special Collections, and

University Archives of the U.W. Libraries, relevant material in the archives of the School of Aquatic and Fishery Sciences, U.W., and Cobb's published and unpublished works.<sup>2</sup> A history of the School of Fisheries, published by Stickney (1989), provided a basic roadmap for a detailed inquiry of Cobb's career at the University of Washington. The College of Fisheries has undergone several name changes over the years. It was a College from 1919 to 1930, a Department of Fisheries from 1930 to 1934, a School of Fisheries from 1934 to 1958, a College of Fisheries, again, from 1958 to 1981, a School of Fisheries from 1981 to 2000, and in 2000 was renamed the School of Aquatic and Fishery Sciences. A brief history of the School of Fisheries, based on Stickney's (1989) book, is posted on the School's web site.<sup>3</sup>

### John N. Cobb, Author and Naturalist

John Nathan Cobb was born in Oxford, N.J., on 20 February 1868, the son of Samuel Spencer Cobb (1842–1921), a railroad engineer, and Louise Catherine Richard (1845?–1918), a native of Belport, France. He was one of at least twelve children in the family (Fig. 2).<sup>4</sup> His vitae indicates that he attended "public schools" and discontinued his education at an early age to go to work.

The family apparently moved in the 1880's to Pennsylvania, and records indicate that in 1884, at the age of 16 years, he was working for a Pennsylvania newspaper, the *Carbondale Reader* (Fig. 3). He rose to become an editor of that periodical. For the next 15 years or so, Cobb worked, apparently as a stenographer and typist, in a variety of positions for a railroad company, a law firm, a supply and machinery enterprise, and a brick manufacturing company.

<sup>2</sup> David Henken wrote a Senior Paper for the U.W. History of Science course that dealt primarily with Cobb's venture into fish passage research in the 1920's. Henken, D. 1999. John Nathan Cobb: Cooperation between hydro and fisheries in the 1920's. Unpubl. manuscr., Univ. Wash., 74 p.

<sup>3</sup> www.fisheries.washington.edu/history/html.

<sup>4</sup> Honor Conklin, Albany, N.Y., personal commun., 24–25 Nov. 2003.

Cobb successfully passed a Civil Service examination in 1895 for the U.S. Government that qualified him for a position as stenographer and typist at a salary of \$720 per year. He accepted a position in Washington, D.C., on 1 July 1895 with the U.S. Fish Commission<sup>5</sup>, where he was appointed clerk in the Division of Statistics.<sup>6</sup> He was promoted to "Field Agent" on 11 February 1896 at a salary of \$1,000 per annum, and was responsible for collecting commercial fishery statistics. Thus Cobb began a career in fisheries that was to last until his death 35 years later and one that led to his recognition as an "expert" in fisheries statistics.<sup>7</sup>

Cobb's position with the "Fish Commission" demanded considerable travel, as he was required to proceed throughout the eastern seaboard to collect statistics on the commercial catch of fish and shellfish. For example, in 1896–97 Cobb visited Jacksonville, Fla.; Havre de Grace, Md.; Key West, Fla.; Wilkes-Barre, Pa.; Key West again; and Cape Vincent, N.Y. After most of these trips he returned to the USFC headquarters in Washington, D.C. This pattern of frequent travel continued

<sup>5</sup> The U.S. Commission of Fish and Fisheries was founded as an independent agency in 1871 and is commonly referred to as the U.S. Fish Commission (USFC). Effective 1 July 1903, the U.S. Congress changed the name of the U.S. Fish Commission to the U.S. Bureau of Fisheries and placed it administratively in the U.S. Department of Commerce and Labor.

<sup>6</sup> University of Washington Libraries, Manuscripts, Special Collections, and University Archives (hereafter University of Washington Archives). John Nathan Cobb papers, Accession No. 1595-6, Box 1, Folder 3. Cobb at an early age was quite interested in forging a career. He frequently solicited letters of recommendation from his employers during 1884–95, many of which are present in the Cobb papers. Cobb also left a large collection of photographs of the College, the university, fisheries scenes, and other topics, present in the University of Washington Archives, Cobb Collection, No. 418.

<sup>7</sup> University of Washington Archives, Accession No. 1595-6, Box 2, Folder 10, U.S. Bureau of Fisheries, 1895–1903. Cobb married Harriet Collin Bidwell (1869–1941), a cousin, in 1898 and the couple had one daughter, Genevieve Catherine (1900–1977). Genevieve graduated in zoology from the University of Washington and, after receiving a degree in librarianship at the U.W., became a librarian at Princeton University until her retirement. Honor Conklin, personal commun., 24–25 Nov. 2003; Anonymous, 1943.



Figure 2.—Young John N. Cobb [n.d.]. Courtesy of Honor Conklin, Albany, N.Y.



Figure 3.—Young John N. Cobb [n.d.]. Courtesy of Honor Conklin, Albany, N.Y.

through 1900.<sup>8</sup> Cobb's first publication for the Fish Commission, on the fisheries of Lake Ontario, was issued in 1898 (Cobb, 1898). He produced about 18 scientific publications and books during his tenure with the Fish Commission from 1895–1911 (Table 1).

In May 1901, Cobb was assigned to investigate the fisheries of the Hawaiian Islands. This project, part of a larger study of the aquatic resources of the Islands, was led by Barton Warren Evermann (1853–1932), a noted ichthyologist for the Fish Commission. The trip lasted nearly 3 months as Cobb canvassed the commercial and “native” fisheries of the Islands, after

<sup>8</sup> University of Washington Archives, Accession No. 1595-6, Box 2, Folder 10, U.S. Bureau of Fisheries, 1895–1903.

which Cobb was directed to proceed to Stanford University, Calif., to help finish the report on the investigations.<sup>9</sup> A major publication resulted from this program (Jordan and Evermann, 1902) and Cobb authored a chapter in it (Cobb, 1902). This expedition put him in contact with the leading ichthyologist of the era, David Starr Jordan (1851–1930)<sup>10</sup>, the President of Stanford University, a connection that was to serve him well later.<sup>11</sup>

Cobb was directed by the Bureau of Fisheries to return to Hawaii in early

<sup>9</sup> University of Washington Archives, Accession No. 1595-6, Box 2, Folder 10, U.S. Bureau of Fisheries, 1895–1903. Evermann later became Director of the Calif. Academy of Sciences, San Francisco. Additional information about Evermann may be found in Hanna and Peers (1944) and Jennings (1997).

1904 where he compiled catch statistics collected in 1903 so as to compare them to those collected in 1901. The fisheries statistics he collected in the Islands resulted in a paper, *The Commercial Fisheries of Hawaii*, which was published by the Bureau (Cobb, 1905).

In 1904 Cobb began to lobby the Bureau of Fisheries for a position in Alaska. He asked Dr. Jordan to write a letter in support of his request to become

<sup>10</sup> For more on Jordan, see Snyder (1905) and Hubbs (1964). Jordan's autobiography contains a wealth of information about the fisheries of the late 19th and early 20th centuries (Jordan, 1922). For more information on Stanford University and that school's role in fisheries education, see Brittan (1997).

<sup>11</sup> Jordan to Cobb, dated Stanford University, 26 July 1901. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 10.

**Table 1.—Fisheries publications of John N. Cobb during his tenure with the U.S. Bureau of Fisheries, 1895–1912. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 10.**

Author(s)	Year Publ.	Title of paper	Journal
Cobb, J. N.	1898	The fisheries of Lake Ontario in 1897	Rep. New York Comm., Fish. Game, Forests, p. 205–221
Cobb, J. N.	1898	Possibilities for an increased development of Florida's fishery resources	Bull. U.S. Fish. Comm. 17:349–351
Cobb, J. N.	1899	The commercial fisheries of Lake Erie, Lake Ontario And Niagara and St. Lawrence Rivers	Fifth Ann. Rep., New York Comm. Fish., Game and Forests, 1899:189–239
Cobb, J. N.	1900a	The lobster fishery of Maine	Bull. U.S. Fish Comm. 19:241–265
Cobb, J. N.	1900b	The sturgeon fishery of the Delaware River and Bay	Rep. U.S. Comm. Fish for 1899:369–380
Cobb, J. N.	1902	Commercial fisheries of the Hawaiian Islands	Rep. U.S. Comm. Fish Fish. 1901, 27:383–499
Cobb, J. N.	1903a	The sponge fisheries of Florida in 1900	U.S. Bur. Fish. Doc. 585:161–175
Cobb, J. N.	1905a	The commercial fisheries of the interior lakes and rivers of New York and Vermont	Rep. U.S. Fish Comm. for 1903:225–246
Cobb, J. N.	1905b	The commercial fisheries of the Hawaiian Islands in 1904	Rep. Bur. Fish. 1904:433–511
Cobb, J. N.	1906a	The commercial fisheries of Alaska	U.S. Bur. Fish. Doc. 603, 46 p.
Cobb, J. N.	1906b	Investigations relative to the shad fisheries of North Carolina	North Carolina Geol. Surv., Econ. Pap. No. 12, 42 p.
Cobb, J. N.	1907	Report on the fisheries of Alaska in 1906	Rep. Comm Fish. 1906 and Spec. Pap. Bur. Fish. Doc. 618, 24 p.
Marsh, M. C., and J. N. Cobb.	1908	The fisheries of Alaska in 1907	Rep. Comm. Fish. 1907 and Spec. Pap. Bur. Fish. Doc. 632, 64 p.
Marsh, M. C., and J. N. Cobb.	1909	The fisheries of Alaska in 1908	Rep. Comm. Fish. 1908 and Spec. Pap. Bur. Fish. Doc. 645, 78 p.
Marsh, M. C., and J. N. Cobb.	1910	The fisheries of Alaska in 1909	Rep. Comm. Fish. 1909 and Spec. Pap. Bur. Fish. Doc. 730, 58 p.
Cobb, J. N.	1910	The king salmon of Alaska	Trans. Am. Fish. Soc. 39:124–129.
Marsh, M. C., and J. N. Cobb.	1911	The fisheries of Alaska in 1910	Rep. Comm. Fish. 1910 and Spec. Pap. Bur. Fish. Doc. 746, 72 p.
Cobb, J. N.	1911	The salmon fisheries of the Pacific Coast	U.S. Bur. Fish., Doc. 751, 180 p.

a Field Agent in that territory.<sup>12</sup> Cobb obtained the desired position in February 1905, and his appointment as “Assistant Agent” paid \$200 per month.<sup>13</sup> Still based in Washington, D.C., Cobb traveled to Alaska each summer to observe the commercial salmon fisheries and to collect catch statistics. He was apparently a conscientious worker and was known for his aggressive enforcement of fishery regulations.<sup>14</sup> Additionally, Cobb was writing books and reports about fisheries. These included annual reports from 1905 to 1910 on the fisheries of Alaska

(e.g. Cobb, 1907; Marsh and Cobb, 1911) and a book, “*The Salmon Fisheries of the Pacific Coast*” (Cobb, 1911).<sup>15</sup>

By early 1911, Cobb was eager for a transfer from Washington, D.C., to the west coast. In March of that year he wrote George Mead Bowers (1863–1925), Commissioner of the U.S. Bureau of Fisheries, asking to be transferred to Seattle.<sup>16</sup> His request was denied, so Cobb turned to the private sector for employment. On 5 March 1912, Cobb wrote again to Commissioner Bowers, this time tendering his resignation:

“Feeling that there is little, if any, opportunity in the Bureau for the advancement of an economic man, and having received an excellent offer from the Union Fish Company of San Francisco, I have decided to resign my office in the Bureau in order to accept the new position, and herewith enclose my resignation.”<sup>17</sup>

Cobb thus left the employ of the U.S. Bureau of Fisheries to pursue greener paths. He never worked for the Bureau again, but he was always interested in returning if an attractive position became available.

### Ventures into the Commercial Realm: Cobb as “Canneryman” and Editor

Cobb joined the Union Fish Company in San Francisco in the spring of 1912 in

<sup>12</sup> See Cobb to Jordan [n.d., but 1904]. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 11. This was the era of political patronage and the President often made (recommended) appointments of people to various government positions. For example, Cobb again enlisted the help of Jordan in 1909 to get re-appointed to his position as a Field Agent in Alaska. Fred Warner Carpenter (1873–1957), Secretary to President William Howard Taft (1857–1930), to Charles Nagel (1849–1940), Secretary of Commerce and Labor, dated Washington, D.C., 15 May 1909. University of Washington Archives, Accession No. 1595-6, Box 1, Folder 3. See also Nagel to Carpenter, dated Washington, D.C., 18 May 1909. This letter of reappointment of Cobb cites the recommendation of Jordan. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 12.

<sup>13</sup> Victor Howard Metcalf (1853–1936), Secretary of Commerce and Labor, to Cobb, dated Washington, D.C., 16 Feb. 1905. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 11. Henken (footnote 2) reviewed Cobb's years with the Bureau of Fisheries.

<sup>14</sup> Boyce, J. U.S. Attorney for the Division of Alaska, to Cobb, dated Juneau, 30 Dec. 1906. University of Washington Archives, Accession No. 1595-6, Box 1, Folder 3. As an example, Cobb reported to Bureau headquarters that Alaska fish processors were using only the belly of pink (*O. gorbuscha*) and other species of salmon and wasting the remainder of the fish, in violation of the law. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 12. See also Henken, footnote 2.

<sup>15</sup> In January 1909, Cobb was temporarily detailed to the U.S. Census Bureau to survey various fisheries. In February 1910, he was again temporarily detailed to survey the fisheries of Northern Calif., Washington, and Oregon. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 12. He was sent in May 1911 to Seattle to canvas the halibut fishery. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 13.

<sup>16</sup> Cobb to George M. Bowers, dated Washington, D.C., 28 Mar. 1911. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 13.

<sup>17</sup> Cobb to Bowers, dated San Francisco, 5 Mar. 1912. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 13. Cobb did not cut his links to the Bureau, as he offered in this letter to aid the Bureau in the future in any way he could. Cobb wrote similar letters to Hugh McCormick Smith (1865–1941), who was to succeed Bowers as Commissioner later in the year; to Jordan and Evermann, as well as to President William Howard Taft, among others. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 13.

a management position at a considerable increase in salary. The company fished for Pacific cod in Alaska, and Cobb traveled north on the company boats, the *Union Jack* in 1912 and the *Sequoia* in 1913, operating out of Sand Point and Unga, Alaska.<sup>18</sup> Cobb's experience with the Union Fish Company was not satisfactory, as he apparently was not granted the freedom to manage as he had hoped, and he left the company in November 1913 on good terms.<sup>19</sup>

Cobb sought to improve his position, as he continually did, and in November 1913 the commercial fishing trade magazine *Pacific Fisherman* (Fig. 4) based in Seattle, hired him, though at a significantly lower salary than that paid by the Union Fish Company. In his letter of acceptance, Cobb agreed to move to Seattle about 15 November 1913 and to accept a salary of \$40 a week "for the present." His salary at the Union Fish Company was \$200 a month.<sup>20</sup> This monthly publication was the preeminent voice for the fishing industry of the west coast. He was hired as the editor of the publication and his particular experience in fisheries for the Bureau of Fisheries and the Union Fish Company brought rare skills to the magazine. The owner of the periodical, Legh Miller Freeman (1875–1955), became a power in the commercial fisheries industry and in fisheries conservation efforts. The *Pacific Fisherman* was a large format magazine devoted to all aspects of the fishing industry on the west coast. It paid particular attention to fishing developments in Alaska, and Cobb's experience in that territory was likely valuable to the magazine.<sup>21</sup>

Cobb remained with the magazine for 4 years. During this period he estab-

lished himself as an informed observer of the commercial fishing and fisheries scenes. As editor, Cobb most likely had wide latitude over what was published in the journal. He wrote articles that appeared in the journal under his byline, such as "Utilizing waste products in the salmon industry" (Cobb, 1913), and "New methods in Pacific coast fisheries" (Cobb, 1915a). Cobb reviewed "The future of Alaska's fisheries" in the journal's Alaska Fisheries Number in 1914 (Cobb, 1914a) and wrote about Pacific coast fishing methods in the journal's 1916 annual yearbook number (Cobb, 1916c).

Cobb also wrote for the scientific world, publishing in professional journals. An example of the latter includes "Pacific halibut fishery declining" (Cobb, 1915c), published in the *Transactions of the American Fisheries Society*. During his years with the periodical he published one book *Pacific Cod Fisheries* (Cobb, 1916b), a revised edition of which was issued in 1927, and in 1917 he published a revised version of his book, *Pacific Salmon Fisheries* (Cobb, 1917).<sup>22</sup>

Cobb helped found the Pacific Fisheries Society in Seattle in 1914. Patterned after the American Fisheries Society, the new organization was directed toward the interests of fisheries workers, mainly scientific but also for members of the commercial industry, of the U.S. west coast (Anonymous, 1914a, d). The Society produced an annual publication, at least in 1914 and 1915, titled *Transactions of the Pacific Fisheries Society* (with Cobb as editor and publisher), in which Cobb published articles (e.g. Cobb 1915b, 1916a). Cobb was Secretary of the organization in 1914–15 and President

in 1921 and 1923. Active membership in this new organization enabled Cobb to meet and to socialize with the leading men in both the scientific and commercial aspects of the Pacific coast fisheries (Fig. 5).<sup>23</sup>

Although successful as an editor, Cobb entertained visions of returning to work for the Bureau of Fisheries. In May 1914, the U.S. Bureau of Fisheries Commissioner Hugh McCormick Smith telegraphed Cobb asking whether or not he could take a temporary job with the Bureau to investigate salmon fishing conditions in Siberia. Cobb was apparently unable to accept the offer, likely due to his current job. However, he wrote to Smith indicating his interest in heading the Seattle office of the agency. Smith offered Cobb the requested position in November 1914 and asked when he might begin work. Cobb responded, the "quicker the better."<sup>24</sup> Cobb was advised by an official of the Bureau, however, that the Secretary of Commerce, William Cox Redfield (1858–1932), was "opposed to the appointment of any person connected with a trade journal or with any fishing company or organization."<sup>25</sup> Cobb then withdrew his name

<sup>23</sup>The U.W. Library has the *Transactions* for only 1914 and 1915. I was unable to determine if later issues of the *Transactions* were issued. A "List of members, *Pacific Fisheries Society* for notification, 1923–1924," is present in the University of Washington Archives, U.W. Fisheries papers, Accession No. 74-6, Box 25, Folder 7.

<sup>24</sup>Telegram, Smith to Cobb, dated Washington, D.C., 1 May 1914. I did not locate Cobb's response to Smith's telegram. There are several letters in the Archives, however, concerning his attempt to secure employment with the Bureau in 1914. See Cobb to Smith, dated Seattle, 2 May 1914. Smith to Cobb dated Washington, D.C. 14 May 1914; Smith to Cobb, dated Washington, D. C., 2 Nov. 1914; Cobb to Smith, dated Seattle, 7 Nov. 1914; Smith to Cobb, dated Washington, D.C., 13 Nov. 1914; and Cobb to Smith, dated Seattle, 16 Nov. 1914. All in University of Washington Archives, Accession No. 1595-6, Box 2, Folder 14. See also Cobb to Smith, dated Seattle, 8 Nov. 1914, and Cobb to Smith, dated Seattle, 14 Nov. 1914. University of Washington Archives, Accession No. 1595-6, Box 1, Folder 30.

<sup>25</sup>Ward Taft Bower to Cobb, dated Washington D.C., 30 Dec. 1914, and marked "personal." University of Washington Archives, Accession No. 1595-6, Box 1, Folder 30. Bower (1881–1960), based in Washington, D.C., had been the Inspector of Alaska Salmon Fisheries for the Bureau. He was appointed to the position Cobb desired when the Bureau opened a Seattle office in 1914 (Anonymous, 1914c).

<sup>18</sup>University of Washington Archives, Accession No. 1595-6, Box 8, Folder 5. Cobb kept personal diaries, apparently from 1897–1927, many of which are present in the Cobb papers. His diary for his years with the Union Fish Company contains details of his work with the company as well as personal notes. University of Washington Archives, Accession No. 1595-6, Box 8, Folder 5.

<sup>19</sup>Webb (footnote 1) briefly described Cobb's aborted career with Union Fish Company.

<sup>20</sup>University of Washington Archives, Accession No. 1595-6, Box 1, Folder 30.

<sup>21</sup>Freeman wrote an unpublished autobiography. Freeman, M. 1956. The memoirs of Miller Freeman, 1875–1955. Unpubl. manuscr., 166 p. A daughter-in-law published a biography of Freeman (Wright, 1977). More information about fisheries issues of the era is provided by Dewitt Gilbert (1896–1981), a former editor of *Pacific Fisherman* (Gilbert, 1988).

<sup>22</sup>A partial list of Cobb's publications, as well as many reprints of his articles, are present in the University of Washington Archives, Accession No. 1595-6, Box 1, Folder 1 and Box 15, Folder 1.

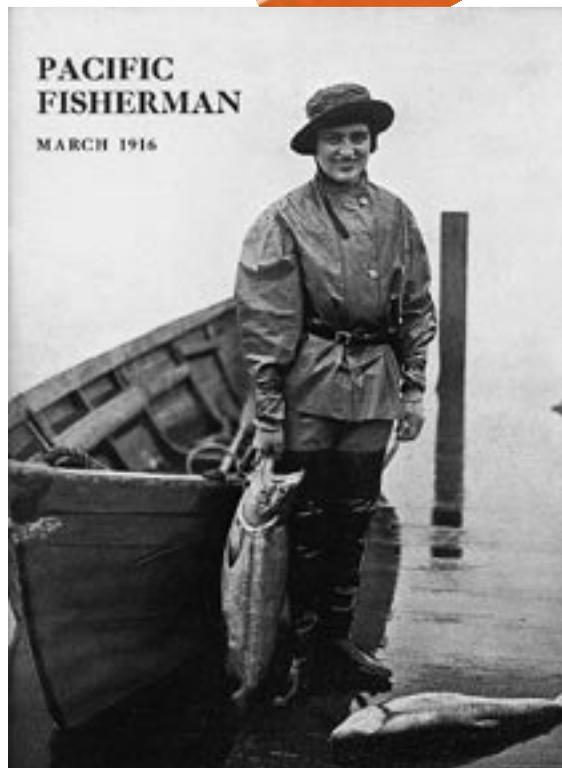
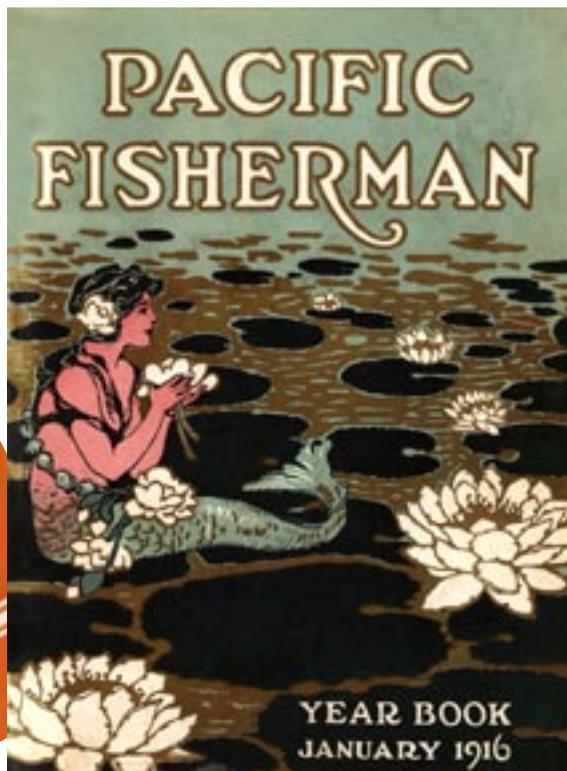


Figure 4.—(This page) Selected covers of *Pacific Fisherman* magazine from 1915 to 1917. University of Washington, Fishery-Oceanography Library. (Opposite) Page from *Pacific Fisherman*, August 1915.

# Pacific Fisherman

A Journal Devoted Exclusively to the Fishing Industry.  
ISSUED ON THE FIFTH OF EACH MONTH

VOL. XIII

SEATTLE, WASHINGTON, AUGUST, 1915.

NO. 8

## Shipping Fish Direct to the Consumer

When C. H. Eagers, of Tacoma, first advertised that he would ship a salmon to anywhere in the United States, except over the Southern Express Company lines, for \$1.25, which price included also all charges for handling the fish, he did not think that he would be the forerunner of a number of others who would not only follow but also enlarge upon his idea. He was soon followed by J. F. Todd, of Seattle, who is now the oldest dealer in this line on the Coast, Mr. Eagers having soon dropped out. For a while Mr. Todd had all of the business, but other concerns soon took it up, among them being the Pacific Salmon Company, Pacific Sales Company, Mail Order Fish Company, of Seattle, and the Pacific Salmon Supply Company, of Tacoma. At the present time one can not only obtain a choice fresh salmon, but also may purchase salt, smoked and kippered salmon, salt codfish, and fresh halibut, smelt, crabs, and other sea food in season.

While these shipments of salt fish may be made by either parcel post or express, it is probable that most of them go by the former. In shipping fresh fish, however, the conditions are different. The postoffice department will not accept packages in which ice is used for preserving fish. As a result of this regulation it is not possible to ship fresh fish beyond the first postal zone (up to 50 miles from the initial mailing point) except in parcels, when the postmasters are also authorized, in their discretion, to accept shipments for the second zone (50 to 100 miles from the initial point). In making fresh fish shipments by parcel post from fish are generally used. As a result of the limitations on the parcel post the express companies have practically a monopoly of the fresh fish shipments, and also handle a considerable proportion of the smoked and salt shipments.

But few persons engaged in the fishing industry,



FRESH SALMON PACKED IN ICE FOR SHIPMENT BY EXPRESS.

place these fish with the local fish dealer or sell them retail to whoever cared for them.

In this way the young and struggling fish dealers of the coast would get into touch with the retail dealers in the various towns and ultimately build up a trade which would obviate the necessity for making "Jerry" shipments.

Probably three-fifths of the fresh fish sold in this country are handled by the express companies. In the early days the companies were much handicapped in carrying on the business by the lack of adequate and proper equipment. At that time

panies. They immediately began to chat about for business to replace that lost, and the possibility of increasing their fish-carrying trade was one of the first taken up. The companies were quick to recognize the importance to them of the advance of shipping fresh fish in small lots to individual consumers throughout the country, and extended every aid possible to these shippers.

In shipping individual fish the latter is packed in a box containing 20 pounds of cracked ice. These boxes are collected by the express company and are generally sent out in the company's own regular cars attached to the trains leaving in the evening. About every fifteen to twenty hours the box is opened and from five to seven pounds, depending upon the weather, of fresh cracked ice added to the box to make up the loss through melting.

When the industry began the companies notified their agents throughout the country, and immediately each one became a worker for the shipper. Naturally no effort was made to push one man's goods any more than another's, the aim of the companies being to help all.

The extent of the demand through the express agents varied greatly. Some agents evidently devoted more time to the work than others, this being especially noticeable in the small towns, where the agent has much more spare time on his hands than his brother in the larger towns. The Wells-Fargo agent at Kerrville, a small town near San Antonio, Texas, probably holds the record with a total of thirty-five orders for salmon in one day.

At first it was feared that this phase of the

**SALMON**

DIRECT TO CONSUMER, \$1.25

I will deliver a live, fat Puget Sound Salmon to any express office in the U. S. (except Southern Express), express prepaid, for \$1.25, weight 1 to 3 lbs. I guarantee it to be a genuine Puget Sound Salmon and I guarantee it to arrive in best-class condition.

The salmon season closes in March. Order now and prevent and save one of these delicious fresh fish in your friends back East. Send money order or bank draft. Deliveries are made in Seattle.

J. F. TODD, Quinn Dock, Seattle, Wash.

A SMALL ADVERTISEMENT WHICH SOLD THOUSANDS OF SALMON.

refrigerating science was in its infancy, and all shipments had to be placed in boxes with cracked ice. As packing stations were infrequent, this necessarily restricted the shipments to comparatively short distances.

Today the companies are equipped with up-to-date refrigerator cars, in which fresh and frozen fish may be carried to any place on the continent to which the rail lines of this country extend, while in conjunction with the steamers in which refrigerator space is provided, shipments may be

**Pacific Salmon Co., Inc.**

301 Northern Bank Bldg., Seattle, Wash.  
Will Deliver One

**CHOICE SALMON**

weighing from 1 lb. to 3 lbs., dressed to our express office in the U. S., at charges prepaid, for \$1.25.

Carefully packed in ice, and so-losed daily by express company with guarantee is received. Shipped in strict compliance with conditions. We also ship strictly Fresh Crabs, Smelt, Halibut, Kippered Salmon, Kippered Herring, and all other Sea Food.

Correspondence Invited. Write Dept. F.

ONE OF THE ADVERTISEMENTS USED IN MAIL-ORDER CAMPAIGN.

outside of those directly concerned, appreciate the immense help the express companies of this country have been in the development of the industry, and especially on this coast.

There is probably not a fresh fish dealer on this coast who did not, in his early business career when trying to enlarge the range of his shipments, dump onto the various express companies "Jerry" shipments of fresh fish. "Jerry" shipments are those shipped, e. g., to the express agent in some town, the fish being titled to him also, with the understanding that he is to sell the fish to somebody and remit the proceeds to the shipper. In order to accommodate the shipper and increase the express company's business, and, incidentally, his own compensation, the agent would either

**Delicious Salmon**

from

**Puget Sound**

Order by mail. We save you half the cost. Send us \$1.00 by P. O. Order or Express Money Order, and we will send you by freight or express as you prefer, 1 lb. of Choice No. 1 Puget Sound Salmon, and 1 lb. of Selected Smoked Salmon. Try them, they will save you.

**PACIFIC SALMON SUPPLY**

301 & St., Tacoma, Wash.

TYPICAL SALMON MAIL ORDER COPY.

made to all the principal countries of the world. The installation of the parcel post by the U. S. government for a time caused a considerable falling off in the general business of the express com-



SALES BOOTH USED BY PACIFIC SALMON CO. DURING "SMOKE WEEK" IN SEATTLE.

from consideration to avoid embarrassment for Commissioner Smith.<sup>26</sup>

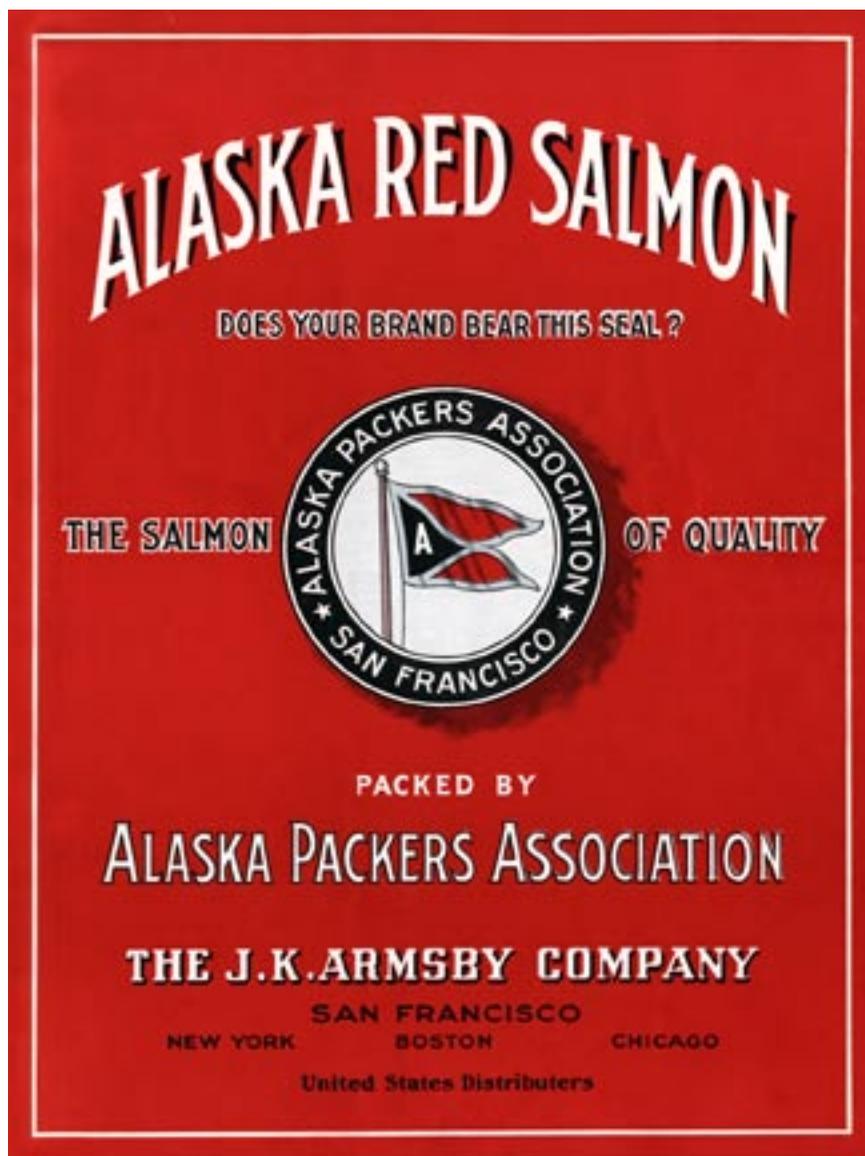
<sup>26</sup> Cobb to Smith, dated Seattle, 6 Jan. 1915. University of Washington Archives, Accession No. 1595-6, Box 1, Folder 30. In 1915, the position of Deputy Commissioner of the Bureau became available. Cobb sent a telegram to Jordan asking the latter to write a letter of support for the position to President Woodrow Wilson (1856–1924) and Secretary of Commerce Redfield. Cobb to Jordan, dated Seattle, 13 Mar. 1915. University of Washington Archives, Accession No. 1595-6, Box 5, Folder 2. I did not locate any other correspondence concerning this request to Jordan.

Cobb, in early 1916, was then offered a position as General Superintendent with the Alaska Packers Association (APA) of San Francisco, Calif., at a salary nearly twice what he was receiving from the *Pacific Fisherman*. The Association was the largest and most influential commercial fishing enterprise in Alaska (Cooley, 1963). At that time APA operated the most fishing boats, employed the most workers, and canned the most salmon of any Alaska cannery. Cobb considered the potential of the position but, at the same

time, longed for a return to the Bureau of Fisheries. A position with the latter agency was not forthcoming and, by the time Cobb responded affirmatively to the company, the position at APA had been filled. The position again became available in early 1917 and this time Cobb accepted the offer. Cobb signed a 5-year contract with APA to begin work on 29 January 1917. The terms of the contract allowed Cobb to resign his position within five years if the management of APA, to whom he was reporting, changed during his employment with the firm.<sup>27</sup> Cobb resigned from the *Pacific Fisherman* on 26 January 1917 to accept the position with APA.<sup>28</sup> His move to APA seemed part of his continuous desire to improve his status, economic and otherwise.

During the salmon fishing season in Alaska in the summers of 1917 and 1918, Cobb traveled north to visit the various APA concerns. His work involved inspecting the working and sanitary conditions in the canneries. Because of his previous work in Alaska with the Bureau of Fisheries, Cobb was familiar with most of the APA packing operations there.<sup>29</sup>

Cobb was apparently satisfied with his work with APA, but he again sought another position of advancement. Cobb's experience in the fisheries of Alaska, his former position at the *Pacific Fisherman*, and his involvement with the Pacific Fisheries Society placed him at



An advertisement for the Alaska Packers Association in the *Pacific Fisherman*, ca. 1915.

<sup>27</sup> There is much correspondence in the Archives between Cobb and Jefferson Moser about Cobb's possible employment with APA. See telegram, Moser to Cobb, dated San Francisco, 1 Jan. 1917; Cobb to Moser, dated Seattle, 18 Jan. 1917; and Henry Fortman, President APA to Cobb, dated San Francisco, 17 Feb. 1917. University of Washington Archives, Accession No. 1595-6, Box 1, Folder 5. Webb described the intricacies of Cobb's negotiations with APA (footnote 1).

<sup>28</sup> Cobb to Freeman, dated Seattle, 26 Jan. 1917, "am severing my connections with you." Also, Freeman to Cobb, dated Seattle, 21 Feb. 1917. Freeman gave his blessings to Cobb's departure, recommending that Cobb take the job but that "[Cobb] can always return to Pacific Fisherman." University of Washington Archives, Accession No. 1595-6, Box 1, Folder 30. Freeman temporarily replaced Cobb as editor of the journal. In the July 1917 issue of the magazine, Steadman H. Gray was listed as editor.

<sup>29</sup> Cobb kept personal diaries, as well as other records, of his years with APA. University of Washington Archives, Accession No. 1595-6, Boxes 8 and 10.

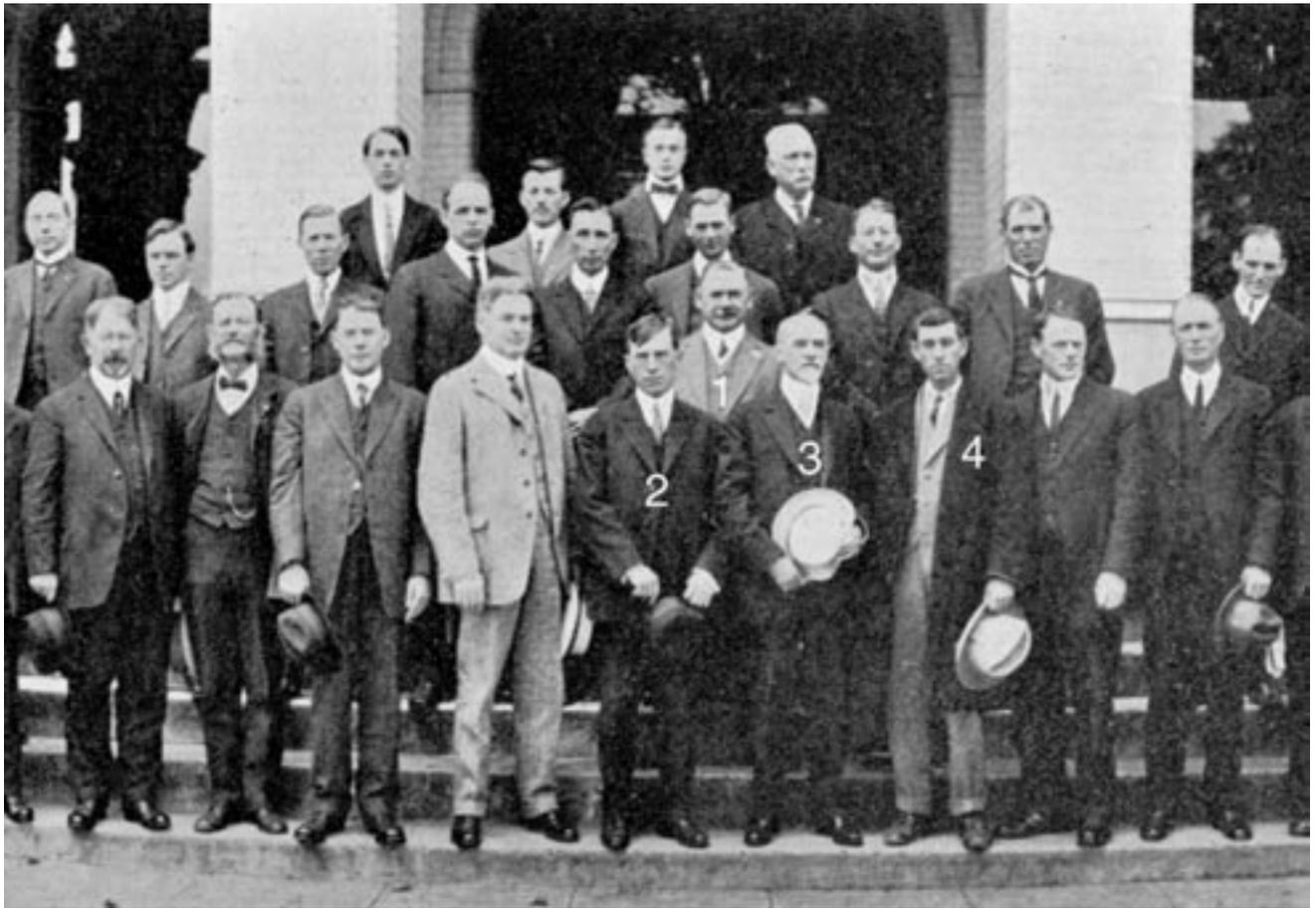


Figure 5.—Attendee's at the first Pacific Fisheries Society Meeting, held in Seattle from June 10–12 1914. 1) John N. Cobb, 2) Miller Freeman, 3) Hugh M. Smith, and 4) Trevor D. C. Kincaid. *Pacific Fisherman*, 1914, 12(6):11.

the forefront of a burgeoning movement to establish a “school of fisheries” at the University of Washington. He was not an unwitting observer of this movement. Indeed, he kept his name always fresh to the University administration and the result was that Cobb resigned from APA in January 1919 to accept the founding directorship of the College of Fisheries at the University of Washington.<sup>30</sup> This new position would serve him well and allow him to use his diverse talents in the fisheries field.

### **The Founding of the College of Fisheries at the University of Washington**

The origin of the idea of a fisheries school at the University of Washington

is unknown, but Miller Freeman likely played a vital role in the establishment of this new College. Richard Van Cleve (1906–1984), a longtime Dean of the renamed College of Fisheries who served from 1948–1971, ascribed the

<sup>30</sup> Cobb to Henry F. Fortman, dated San Francisco, 31 Jan. 1919, “The President and Board of Regents have elected me to the position of Director of it.” Fortman gave his blessing to Cobb’s request, writing “With your qualifications, the directorship of the College of Fisheries at the University of Washington will give you a superior scope of endeavor and enable you to greatly further the development of the Pacific Coast fisheries.” Fortman to Cobb, dated San Francisco, 8 Feb. 1919. University of Washington Archives, Accession No. 1595-6, Box 1, Folder 5. Cobb maintained good relations with APA during his leadership of the College of Fisheries.

establishment of the College of Fisheries to Freeman.<sup>31</sup>

Freeman, in a letter dated 1937 to the U.W. President Lee Paul Sieg (1879–1963), wrote in part, “I call your attention to the fact that I secured the establishment of the School of Fisheries at the University of Washington...”<sup>32</sup> In his memoirs, Freeman wrote that he used the editorial pages of *Pacific Fisherman* to advocate the establishment of a school

<sup>31</sup> Van Cleve, R. 1984. History of the College of Fisheries. Unpubl. manuscript, Archives, School of Aquatic and Fishery Sciences, RS 3.3.1, “Flagship papers.” Van Cleve. For additional information on Van Cleve, see Stickney (1989).

<sup>32</sup> School of Aquatic and Fishery Sciences Archives, RS 3.3.1, “Flagship Papers,” photocopies.

of fisheries at the U.W. beginning in 1914 and that, after the conclusion of World War I in 1918, he resumed his lobbying to the U.W.<sup>21</sup>

Seattle became a “boom town” in the period 1900–1920. The city’s population grew from about 81,000 in 1900 to become a major city of some 315,000 people by 1920. Many of Seattle’s major establishments and various aspects of the city’s civic development began during this period (Berner, 1991). Shipbuilding and metal trades were noteworthy components of the local economy in the years before World War I. The processing and transportation of lumber and wood products were important to Seattle and the greater Puget Sound region.

Both forestry and fisheries were important industries for the State of Washington in the first quarter of the 20th century and were of considerable interest to the U.W. Commercial fisheries in Washington State during 1914–1921 were highly dependent on harvest of Pacific salmon, whose catches fluctuated yearly. From 1914 to 1917, fisheries products in Washington State ranged in value from \$1.7 to \$15.2 million (Giles, 1918). According to Darwin (1921), the value of canned salmon in 1919–1920 was \$12.9 million and in 1920–1921 it was much smaller, just over \$4.5 million. Lumber production was the leading industry of the State during the first quarter of the 20th century; its value ranged from \$37.1 to \$68.8 million from 1907–1912, and was \$41.8 and \$53.2 million in 1915 and 1916 (Giles, 1918).

Fisheries, mainly for salmon, were of significant importance to Seattle. By the 1900’s, over a million cases of salmon were packed in Puget Sound and about 5,000 men were employed in fisheries work in Seattle. By 1911, most of the fish packers in Alaska were headquartered in Seattle. They handled some 100,000 tons of fish products annually (Berner, 1991).

The University of Washington was also undergoing a major period of growth during 1900–1920. Faculty numbers grew from 33 in 1902 to 194 in 1913. Enrollment increased from fewer than 200 students in 1898 to over 700 in 1903–1904 and to more than 3,300 in

1913. The campus expanded with new buildings. The University’s first marine laboratories, the Puget Sound Biological Laboratories, were established at Friday Harbor, Washington, in 1904 (Gates, 1961; Berner, 1991). As early as 1912, the U.W. Zoology Department was conducting research on the commercial fishing industry.<sup>33</sup>

The stimulus to action by the U.W. in developing a school of fisheries was provided in 1913 by Bureau of Fisheries Commissioner Smith (Stickney, 1989).<sup>34</sup> Smith submitted a paper to the Annual Meeting of the American Fisheries Society in Boston, Mass., titled “The Need for a National Institution for the Technical Instruction of Fisherfolk” (Smith, 1914).<sup>35</sup> Smith argued that technical education in the U.S. was lacking for fishermen, processors, and those involved in conservation of resources. He urged that this void be filled.

Smith’s paper makes clear that he was primarily interested in educating the commercial fishermen in the ways of his industry, as opposed to educating people to become fishery scientists: “[instruction for] improvement of methods of taking, handling, preserving, and utilizing water products.” He offered “A tentative plan for an institution for the imparting of practical technical instruction to American fisherfolk...” Smith, however, also advocated instruction “To become technical experts in the administration of the fishery services of nation or

state” and “To engage in or take charge of national or state fish-cultural work” (Smith, 1914).

Smith felt that Seattle was the ideal place for such a school. He therefore wrote the Acting President of the University of Washington, Henry Landes (1867–1936) in February 1914:

“I take liberty to bring to your attention the great desirability of establishing at the University of Washington a school of fisheries, or at least a comprehensive course in fisheries, having for its object the equipping of young men and young women for practical work in the service of the federal government, the various states, and private establishments having to do with artificial propagation, the curing and marketing of fishery products, and the administration of the fishing industry.”

Smith further commented on the extensive need for trained people and the lack of qualified workers for the technical aspects of fisheries. He noted that training of “fisherfolk” was a neglected area, and suggested that Seattle was an ideal place for such a school due to its importance to the fishing industry of the Northwest.<sup>36</sup>

Landes quickly responded to Smith, writing that “This is a matter which has already received serious consideration at our hands and I think we will be able to follow out some such scheme in the Northwest.” Landes mentioned offering a course in ichthyology in the Department of Zoology, but he concluded “We find, however, that it will soon be necessary to pay more attention to the economic phase of the question and to offer much more than we are now giving.”<sup>37</sup>

In March 1914, Professor Trevor Charles Digby Kincaid (1872–1970),

<sup>33</sup> The Department of Zoology reported to the Board of Regents Annual Meeting of 1912 “One member of the department staff has spent considerable time in making a study of the fishing industry in this section.” University of Washington Archives, Board of Regents Annual Meeting, 28 May 1912, Reports: Zoology (p. 3, item 2), Accession No. 78-102, Box 19, Folder 2. The Departmental report to the Regents the following year noted that Professor Victor E. Smith’s research was on “Investigations of the fishing industry.” University of Washington Archives, Board of Regents Annual Meeting, 28 May 1913, Zoology (p. 71), Accession No. 78-103, Box 19, Folder 4.

<sup>34</sup> Stickney (1989) provides further information about the founding of the College.

<sup>35</sup> Smith was an ichthyologist who directed the U.S. Bureau of Fisheries from 1913 to 1922 (Hildebrand, 1941; Anonymous, 1968). He was not able to attend the Boston meeting, so his paper was read by George W. Field.

<sup>36</sup> Hugh M. Smith to U.W. President [Henry Landes], dated Washington, D.C., 19 Feb. 1914. University of Washington Archives, U.W. Presidents Office Records, Accession No. 71-14, Box 122, Folder 5.

<sup>37</sup> Acting President [Landes] to Smith, dated U.W., 27 Feb. 1914. University of Washington Archives, U.W. Presidents Office Records, Accession No. 71-14, Box 122, Folder 5.

Chairman of the Department of Zoology, U.W., submitted a report to President Landes "on the advisability of establishing a School of Fisheries."<sup>38</sup> In this 10-page report, Kincaid provided a rationale for establishing such a school, noting that said training was not available in the United States. He briefly discussed schools elsewhere in the world that gave instruction in "fisheries classes," and indicated that "the only fully equipped school of fisheries in existence is the Imperial Fisheries Institute of Japan (Kincaid, 1915)."<sup>39</sup> Kincaid suggested subjects that could form the fisheries curriculum.<sup>40</sup>

Kincaid's proposed curriculum included subjects then offered at the U.W. that could be incorporated into a fisheries program; subjects not then offered, but which the present staff could readily offer; and "subjects demanding additional instructional assistance," such as pisciculture, fisheries products, technology, markets, and administration. His program emphasized training in applied or commercial aspects of the fishing industry rather than a scientific approach to fisheries by teaching biology and other sciences.<sup>41</sup>

<sup>38</sup> Kincaid to Landes, dated U.W., 5 Mar. 1914 (with report). University of Washington Archives, Trevor Kincaid papers, Accession No. 71-34, Box 122, Folder 5.

<sup>39</sup> Kincaid reported that some European countries offered training in oceanography and marine biology or certain aspects of fisheries. Examples mentioned were the Fish Cultural Laboratory, University of Grenoble, France, at the Universities of Kiel and Berlin, in Germany, and at the Biological Station, Bergen, Norway. Various marine biology and oceanography research laboratories in England, Scotland, and Ireland also offered limited training.

<sup>40</sup> This report was most likely prepared by Kincaid at the request of President Landes. Kincaid also indicated that commercial fisheries of the U.S. were then worth some \$70 million. Kincaid to Landes, dated U.W., 5 Mar. 1914 (with report). University of Washington Archives, Trevor Kincaid papers, Accession No. 71-34, Box 122, Folder 5.

<sup>41</sup> Scientific investigation of the U.S. fisheries was in its infancy in this period. Pietsch and Anderson (1997) provide a history of ichthyology, and Smith (1994) reviewed historical aspects of fisheries research. Kincaid to Landes, dated U.W., 5 Mar. 1914 (with report). University of Washington Archives, Trevor Kincaid papers, Accession No. 71-34, Box 122, Folder 5.

Kincaid suggested that the course schedule should be established on a 2-year basis. The first year, he wrote, ought to be of a general character and the second year should allow specialization along two or more lines. Kincaid included a diagram suggesting potential areas of specialization: pisciculture, technology, School of Commerce, and "executive."<sup>38</sup>

Landes forwarded Kincaid's report to Professor Edmund Meany, asking him to review the program of other fisheries schools in a presentation to the Alaska Salmon Canner's Association meeting on 13 March 1914. Landes indicated that the U.W. was contemplating initiating a 2-year course as outlined by Kincaid, beginning the following year. If the reception to this course was good, then Landes thought the University might later expand the offerings to a 4-year curriculum.<sup>42</sup>

At the inaugural meeting of the Pacific Fisheries Society in 1914, Professor Kincaid read a paper describing the proposed school of fisheries at the University of Washington (Kincaid, 1915). At the conclusion of Kincaid's talk, the Society passed a resolution calling for "the establishment of a Department of Fisheries in the College of Science in said institution" (Anonymous, 1914d). Bureau of Fisheries Commissioner Smith, who also addressed the Society, endorsed such a school: "...I would expect that a tremendous boon to the fish industry of the entire country would be given by a fisheries school such as this if established here" (Kincaid, 1915).

Plans were then laid by the U.W. to begin instruction in fisheries in the Department of Zoology in the fall of 1914. Landes wrote Cobb that the U.W. would present a proposal for establishing a

<sup>42</sup> Landes to Meany, dated U.W., 7 Mar. 1914 (with Kincaid's report). University of Washington Archives, Accession No. 71-34, Box 122, Folder 5. Edmund Stephen Meany (1862-1935) was a well-known historian of the Northwest and a U.W. professor. He was also interested in natural history and was one of the first in the Northwest to lecture on Forestry; he is considered the "Father of U.W. Forestry." A brief history of the U.W. College of Forest Resources is located at <http://www.cfr.washington.edu/about/history.html>.

fisheries department to the Board of Regents in July 1914. He further informed Cobb that the U.W. would be able to start instruction soon, but it might be 1 or 2 years before the University could obtain the necessary money to cover later years of the course.<sup>43</sup>

The concept of a "fisheries school" at the U.W. was heartily endorsed editorially by *Pacific Fisherman*. The journal announced in their June 1914 issue that the U.W. was to open a fisheries school that fall, with a 4-year program (Anonymous, 1914b). The journal credited Kincaid and Smith as the impetus behind the establishment of the School (Anonymous, 1914e). The local and national press gave a favorable reception to this concept (Anonymous, 1914f, g).

The possibility of such a school was actively reported by the *Pacific Fisherman* in articles likely written by Cobb. In the October 1914 issue, the magazine announced the "first School of Fisheries in the United States." Rather than a "school" of fisheries, as previously reported, the magazine indicated that the course would for the present be taught in the Department of Zoology. The journal indicated that Kincaid had outlined a different program of study to embrace fisheries and that three students had already enrolled in these classes (Anonymous, 1914e). The U.W. course catalog for 1915-1916 listed courses in ichthyology and in pisciculture as offerings of the Department of Zoology. Ichthyology (Zool. 11, 12, for 2 credits each) was to be taught by Kincaid, and Smith was listed as the instructor for Pisciculture (Zool. 107, 108, 2 credits each).<sup>44</sup>

The insecurity caused by World War I apparently delayed the establishment of the fisheries school (Stickney, 1989; Webb unpubl.<sup>1</sup>). Evidence suggests, however, that planning for the school continued (Anonymous, 1915), and its establishment was supported editorially

<sup>43</sup> Landes to Cobb, dated U.W., 16 June 1914. University of Washington Archives, Accession No. 71-34, Box 122, Folder 5.

<sup>44</sup> U.W. Course Catalog for 1915-1916, p. 204-205. University of Washington Archives.

in the *Pacific Fisherman* (Anonymous, 1916). Evermann (1917) called for government supported fishery experiment stations to conduct research of value to the commercial fishing industry, keeping the general subject alive in the pages of the *Pacific Fisherman*.

Cobb became more visible in the Northwest fisheries and conservation scene and maintained contact with the U.W. administration (Stickney, 1989).<sup>45</sup> He was apparently considered for membership in a proposed committee to search for a director of the new fisheries school.<sup>46</sup> Cobb likely was an early candidate for the position of director of the proposed school.

Cobb wrote a letter to Henry Suzzallo (1875–1933), President of the University of Washington, on 23 June 1916.<sup>47</sup> His 13-page letter began “In compliance with your personal request of some time ago, I submit herewith an outline of a general plan for a Fishery School at the University, and a part of the equipment of same.” In a carefully crafted letter, he emphasized his knowledge of what a fisheries school should be. Cobb began with a justification for the proposed school and included a letter from Commissioner Smith to Cobb, supporting the establishment of such a school.<sup>48</sup> Cobb listed a number of items to be consid-

ered, including possible subjects to be taught: preparation of fishery products, laboratories, fishery products, navigation, engineering, shipyard boat building, workshops, and museum.

As World War I came to a close in November 1918, planning for a school of fisheries at the University of Washington continued at a more rapid pace. In October 1918 President Suzzallo wrote Cobb that through Miller Freeman he had heard that Cobb “might like to participate in the organization of such a school as a member of this faculty.” Suzzallo was most concerned about the salary Cobb would require, noting that “Until this year our maximum salary has been \$3,000.”<sup>49</sup>

Cobb responded to Suzzallo on 26 December 1918 with his application for the position of director, and he noted that he had merely a common school education. He listed some 35 publications on fisheries topics in his application.<sup>50</sup>

Suzzallo answered Cobb on 4 [January?] 1919, appointing him Professor of Fisheries, administrative head of the Department of Fisheries, and Director of the College of Fisheries, at a salary of \$4,000 per year. Cobb’s initial appointment was for a 4-year period.<sup>51</sup>

Suzzallo recommended to the Board of Regents on 17 January 1919 that a College of Fisheries be established at the University of Washington. The Board agreed and the establishment of the College was authorized.<sup>52</sup> This event was

duly reported in the *Pacific Fisherman* (Anonymous, 1919a).

### Cobb as Director of the College of Fisheries

Cobb began the new College on a fast track. In an announcement for the College of Fisheries issued in early 1919, Cobb wrote that so much interest was generated by the announcement of the establishment of the College that “Professor Cobb, the Director, is open [sic] it for the coming spring quarter, March 31st, instead of waiting until the beginning of the fall quarter as originally planned.” The announcement indicated the College would offer a 4-year course of instruction in Fish Culture and Fisheries Technology, and briefly described the potential job market for graduates. The announcement further stated that the College would, so far as possible, “assist students in securing employment during summer vacations” in various aspects of the fishing industry, hatcheries, and elsewhere.<sup>53</sup> The inauguration of the new College duly received wide and positive coverage in the press (Anonymous, 1919b, c). Commissioner Smith was quite pleased with the new College, writing in a glowing review: “The recent establishment by the University of Washington of a college of fisheries is of such importance as almost to mark an epoch in the history of technical education and in the development of the fishing industry in America” (Smith, 1919).

The new College apparently began life housed in two temporary wooden buildings along the Lake Washington Ship Canal at the southern margin of the U.W. campus (Anonymous, 1919a, c; Smith, 1919). The College soon relocated to other “temporary” housing located just north of the present U.W. Medical Center, where it remained until new quarters were built in the early 1950’s (Cobb, 1920; Stickney, 1989).<sup>54</sup>

<sup>45</sup> Cobb submitted a proposal to the U.W. [n.d., but ca. 1916] for research on fish products. He offered to act as a consultant at no cost to the U.W. to supervise a graduate student who would conduct the work. University of Washington Archives, Accession No. 1595-6, Box 12, Folder 2. I could not find records of the fate of this proposal.

<sup>46</sup> Theodore Christian Frye (1869–1962), Dean, College of Science, to President Suzzallo, dated U.W., 22 Dec. 1915. Frye suggested that Suzzallo arrange a meeting between Cobb, the Secretary of the [Seattle] Chamber of Commerce, the Secretary of the [Seattle] Commercial Club, “the man whom you select as temporary head of the fish work, and yourself and myself if possible, to discuss define plans.” This “should be done at once [orig. emphasis].” University of Washington Archives, Accession No. 71-34, Box 122, Folder 5. I was unable to determine whether or not such a committee was established.

<sup>47</sup> Cobb to Suzzallo, dated *Pacific Fisherman*, 23 June 1916. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 21.

<sup>48</sup> Smith to Cobb, dated Washington, D.C., 4 Dec. 1914. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 21.

<sup>49</sup> Suzzallo to Cobb, dated U.W., 24 Oct. 1918. University of Washington Archives, Accession No. 71-34, Box 122, Folder 5. Freeman (footnote 21) wrote that in 1918 he recommended Cobb to President Suzzallo for the directorship of the proposed school.

<sup>50</sup> Cobb to Suzzallo, dated San Francisco, 26 Dec. 1918. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 21.

<sup>51</sup> Suzzallo’s letter is dated 4 June 1919, but that date does not make historical sense. The College, under Cobb’s direction, began in the spring quarter, on 2 Apr. 1919 (Stickney, 1989). See Suzzallo to Cobb, dated U.W., 4 June [?] 1919. University of Washington Archives, Accession No. 1595-6, Box 2, Folder 21.

<sup>52</sup> University of Washington Archives, Accession No. 1595-6, Box 2, Folder 21. The Regents established an advisory board for the College on 15–16 Dec. 1919. University of Washington Archives, Board of Regents papers, Accession No. 78-103, Box 21-3, 1919 Jan–Dec.

<sup>53</sup> “The College of Fisheries.” School of Aquatic and Fishery Sciences Archives, “Flagship Papers,” RS. 3.3.1, No. 3 “photocopies.”

<sup>54</sup> A good description and photographs of the original buildings and facilities of the new College appear in the June 1919 issue of *Pacific Fisherman* (Anonymous, 1919c).



Figure 6.—Faculty of the College of Fisheries, 1929. Left to right, Norman Jarvis, Donald Crawford, John Cobb, Clarence Parks, and Leonard Schultz. University of Washington Archives, U.W. 15484.

The initial faculty was composed of Cobb and two newly hired instructors: George C. Embody, who received his Ph.D. degree at Cornell University, taught courses in Fish Culture, and Clarence L. Anderson, who had recently earned his B.S. degree from the U.W., was mainly responsible for courses in Fisheries Technology. Trevor Kincaid of the Zoology Department taught Ichthyology (Stickney, 1989).<sup>55</sup>

Cobb taught, at various times, Introduction to Fisheries, Fishery Methods, Fishery Problems, and History of

Fisheries.<sup>56</sup> During Cobb's directorship, the faculty remained small and underwent considerable turnover, likely caused in part by the low salaries paid to instructors. The number of faculty listed in course catalogs from 1919–20 to 1929–30 ranged from two to five, including Cobb (Fig. 6).<sup>57</sup> Numerous "Associated Faculty," drawn from other U.W. departments or from industry or government agencies were listed in the Colleges entry in U.W. Course Catalogs. An Advisory Board composed of 11 individuals from the commercial fishing industry, including Miller Freeman, and from state and federal fisheries agencies

was listed in the 1919–1920 course catalog. Most of the faculty in the College were educated at the University of Washington, in whole or part, which resulted in a lack of diversity in faculty training, a problem that plagued the College for about 50 years.<sup>58</sup>

<sup>55</sup> The first U.W. Course Catalog that listed the College of Fisheries was issued for the 1919–1920 academic year. The Catalog indicated that the College offered B.S. and M.S. degrees and listed 12 courses offered, as well as six "short courses." University of Washington Archives. Stickney (1989) provides biographical information about professors during Cobb's era.

<sup>56</sup> University of Washington Archives, Accession No. 1595-6, Box 15, Folders 4-8, and Box 16, Folder 1. There are course outlines written by Cobb as well as other teaching materials in Cobb's papers.

<sup>57</sup> U.W. Course Catalogs, 1919–1930. University of Washington Archives. William Francis Thompson (1888–1965) wrote a history of the School of Fisheries in which he analyzed the course offerings of the College from 1919–1943. See Thompson, W.F. manusc. [n.d.]. "History of the School of Fisheries." Typescript, variously paginated. School of Aquatic and Fishery Sciences Archives, RS. 3.3.1, "Flagship Papers." Thompson, a preeminent scientist of the era, succeeded Cobb as Director of the newly renamed Department of Fisheries in 1930 and served in that position until 1946. For more on Thompson, see Dunn (2002).

<sup>58</sup> U.W. Course Catalogs, 1919–1930. University of Washington Archives.

Cobb had trouble recruiting experienced faculty for the College. For example, he tried to entice Willis Horton Rich (1885–1972), a Professor at Stanford University and renowned researcher on salmon biology, to the U.W. without success, though, offering Rich \$3,000 to head a proposed “Department of Fish Culture.”<sup>59</sup>

The design of the curriculum largely followed that suggested earlier to the U.W. President by Professor Kincaid and previously outlined by Cobb.<sup>38, 47</sup> Two curricular tracks were initially established, fish culture and fisheries technology (Table 2). The two lines of inquiry were quite similar for the first two years, differing mainly in that the requirements for the technology major (Fig. 7) included twice as many chemistry credits as did the fish culture major. The number of fisheries courses offered increased from 12 in the initial year of the College to 24 in the academic year 1928–29 (Table 3).<sup>60</sup>

Enrollment in the College was strong during the first decade of its existence, ranging from 30 to 117 students a year (Table 4). The College initially offered Bachelor and Master of Science Degrees and, later, a Doctor of Philosophy Degree. The first graduating class in Fisheries was in 1922, with five B.S. degrees conferred as well as the first Ph.D. degree, awarded to Ray Clough, then on the College of Fisheries faculty. Identical numbers of degrees were apparently issued each year in 1923, 1924, and 1925. The first M.S. degree was awarded in 1924 to Clarence Anderson, also on the faculty of the College. During Cobb’s reign as Director and Dean, there were 31 B.S. degrees granted (from 1919–20 through the 1928–29 academic years) as well as one M.A., eight M.S., and two Ph.D. degrees.<sup>61</sup> Thus,

<sup>59</sup> Cobb to Willis Rich, dated U.W., 7 Jan. 1922, University of Washington Archives, Accession No. 71-34, Box 122, Folder 6.

<sup>60</sup> U.W. Course Catalogs, 1919–1930. University of Washington Archives.

<sup>61</sup> U.W. course catalogs list the number and type of degrees granted during the years 1919–1929, but that practice was stopped in 1930. U.W. Course Catalogs, 1919–1930. University of Washington Archives. Total enrollment figures for the College are listed in Thompson manuscript in footnote 57.

**Table 2.—Course offerings in Fisheries at the University of Washington, 1919–1920. (U.W. Course Catalog, 1919–1920, U.W. Archives).**

Autumn Quarter	Credits	Winter Quarter	Credits	Spring Quarter	Credits
<b>I. Fish Culture</b>					
Freshman					
Zoology 1	5	Zoology 2	5	Gen. Embryology	5
Intro. to Fisheries 1	2	Intro. to Fisheries 2	2	Chemistry 3	5
Chemistry 1 or 21	5	Chemistry 2 or 22	5	Economics 1	5
English	3	English	3	Military Science	2
Military Science	2	Military Science	2		
Sophomore					
Ichthyology 3	5	Ichthyology 4	5	Aquatic Botany 53	5
Physics 47 or elective <sup>1</sup>	5	Physics 48 or elective <sup>1</sup>	5	Ichthyology 5	5
Elective	5	Elective	5	Pacific Fisheries 6	2
Military Science	2	Military Science	2	Elective	3
				Military Science	2
Junior					
Bacteriology 101	4	Bacteriology 102	4	Fish Culture 103	5
Fish Culture 101	5	Fish Culture 102	5	Fishery Methods 105	5
Plankton (Zool. 106)	5	Fishery Methods 104	5	Electives	5
Elective	2	Elective	2		
Senior					
Fish Culture Problems 107	5	Fish Culture Problems 108	5	Fish Culture Problems 109	5
Fish Diseases 117	5	Electives	10	Electives	10
Electives	5				
<b>II. Fisheries Technology</b>					
Freshman					
Zoology 1	5	Zoology 2	5	Economics 1	5
Intro. to Fisheries 1	2	Intro. to Fisheries 2	2	Chemistry 3	5
Chemistry 1 or 21	5	Chemistry 2 or 22	5	Electives	5
English	3	English	3	Military Science	2
Military Science	2	Military Science	2		
Sophomore					
Org. Chemistry 37	5	Org. Chemistry 38	5	Quantitative Chemistry 101	4
Ichthyology 3	5	Ichthyology 4	5	Pacific Fisheries 6	2
Physics 47 or elective <sup>1</sup>	5	Food Laws (Phar. 16)	1	Ichthyology 5	5
Military Science	2	Physics 48 or elective <sup>1</sup>	5	Elective	5
		Military Science	2	Military Science	2
Junior					
Bacteriology 101	4	Bacteriology 102	4	Employment Management 167	3
Bus. Administration 120	3	Plant Management 195	3	Prep. Fishery Prod. 106	5
Fishery Methods 104	5	Fishery Methods 105	5	Biology of the Seas (Zool. 108)	3
Admiralty Law 165	3	Elective	3	Ec. Fish. Resources 115	3
Senior					
Fishery Problems 110	5	Fishery Problems 111	5	Fishery Problems 112	5
M. Engineering 92	3	Electives	10	Electives	10
Electives	7				

<sup>1</sup> If the student has taken one year of physics in high school he will substitute electives for Physics 47 and 48.

only about 42 students graduated during the first decade of the College.

The courses offered remained similar during the first decade of the College’s existence, with one notable exception. A new series of courses, not associated with fisheries, was started beginning in the fall of 1922. Seven courses on Fruit and Vegetable Preservation were offered that year. Carl R. Fellers was listed in the catalog as “Associate Professor of Food Preservation” and Ray W. Clough was listed as “Lecturer of Food Preservation.” Bachelor of Science and Master of Science degrees were offered in Food Preservation, and a second option,

“Commercial Canning and Curing of Fruits and Vegetables,” was available as an academic major the following year. This option was labeled Food Processing instead of Fish Technology.<sup>62</sup>

<sup>62</sup> U.W. Course Catalogs, 1922–1925. University of Washington Archives. A U.W. news item titled “College plans aid to fruit growers” was released by the University on 4 Mar. 1923. The release described the course offerings and extensively quoted Cobb. University of Washington Archives, Accession No. 1595-6, Box 23, Folder 5. An announcement and outline of the new course, titled “Commercial canning of fruits and vegetables;” [n.d.] is present in University of Washington Archives, Accession No. 1595-6, Box 23, Folder 1. See also Thompson manuscript in footnote 57.

**Table 3.—Course offerings in Fisheries at the University of Washington during the 1929–30 academic year (Stickney, 1989).**

Course no.	Title	Instructor
1, 2	History of Fisheries	Cobb
6	Pacific Fisheries	Cobb
50	Elements of Fisheries	Jarvis
53, 54	Ichthyology	Schultz
60	Aquatic Animals other than Fish	Schultz
65	Fishing Vessels and Boats	Parks
101–103	Fish Culture	Crawford
104, 105	Fishery Methods	Cobb
110	Fresh and Frozen Fishery Products	Jarvis
111	Curing of Fishery Products	Jarvis
112	Oyster and Clam Culture	—
115	The Economic Fishery Resources of North America	Cobb
120	Fundamentals of Canning	Parks
121	Canning Machinery and Cannery Management	Parks
122	Canning of Fishery Products	Parks
140	Aquarium Management	Crawford
145	Food Laws	Parks
147	Preparation of Secondary Products	Parks
150–152	Problems in Fish or Shellfish Culture and Fisheries Technology	Cobb and Staff
154	Diseases of Fish	Guberlet
175	Exploration of the Sea and its Relation to Economic Food Fishes	Cobb
190	Fishways and Fishtraps	Cobb
195–197	Seminar	Cobb and Staff

**Table 4.—Enrollment in the College of Fisheries, 1919–1929 (from Thompson, *manuscr.*, text footnote 57).**

Year	Academic Year	Short Course
1919–20	76	36
1920–21	46	11
1921–22	30	17
1922–23	41	12
1923–24	51	16
1924–25	64	21
1925–26	67	5
1926–27	97	6
1927–28	117	6
1928–29	117	2

The experiment in food processing and preservation was dropped in 1924. Clough was not listed in the Course Catalog after the 1922–1923 academic year, but Fellers continued to be listed as part of the College’s faculty until 1926–1927. Thus ended the College of Fisheries initial relationship with food processing, a subject area that was to return to the School in the late 1940’s.<sup>63</sup>

The College immediately upon opening began offering “short courses” for the benefit of fishermen, processors, and hatchery personnel. These were ap-



Figure 7.—Interior of lab at the College of Fisheries showing students at work, *ca.* 1920. University of Washington Archives, U.W. 15299.

parently offered each winter from 1920 to 1929.<sup>64</sup> The courses were intended to be “practical,” offering instruction on Bacteriology of Foods, Diseases of Fishes, Navigation, Operation of Gas Engines, and First Aid. Attendance in these courses was relatively modest in the first few years, ranging from 11 to 36 registrants each year. After 1925, however, attendance dropped off, averaging only five or six students with only two registrants listed in 1929.<sup>65</sup> The attendance indicates that the demand for such instruction, or the quality of

<sup>63</sup> A food science program was reinstated in the School of Fisheries in 1947 and remained an option for a major for about 45 years. The program was phased out in 1992. Gary Pedersen, Administrator, School of Aquatic and Fishery Sciences, personal commun., 17 Nov. 2003. For additional information about the history of food processing technology offerings of the School of Fisheries, see Stickney (1989).

<sup>64</sup> The draft history of the College of Fisheries by Thompson provides enrollment figures of short courses indicating they were held each year from 1920–1929. Thompson *manuscr.*, footnote 57. The draft history of the College written by Van Cleve, however, states that these short courses were offered annually for seven years and then dropped. Van Cleve *manuscr.* in footnote 31.

<sup>65</sup> Thompson *manuscr.* in footnote 57.

the courses, was not as sufficient as had been hoped.

Cobb decided to offer a summer course in ichthyology in 1922 at the Puget Sound Biological Laboratories, at Friday Harbor, Wash. He sought funding for this course (\$400 for “1 professor of ichthyology and \$75 for 1 laboratory assistant”), but was told that the summer session at the Station was not financed as part of the regular summer session of 1922. He was advised to seek financing from the station director, Theodore C. Frye. Apparently the intended course was not offered.<sup>66</sup>

In the late 1920's Cobb felt the need for additional and improved facilities for the College. He was a strong advocate for the expansion of the College, making requests to various administrative deans for new space. Cobb was largely unsuccessful in these expansion efforts, although he acquired a 29-foot launch, the *Salmonidae*, and a 5-horsepower motor in 1927.<sup>67</sup>

Cobb vigorously promoted the College in a variety of ways. As a former newspaperman, he ensured that many articles were published in the local press. The College was also the subject of attention in the national and international print media.<sup>68</sup> As Dean, he was the subject of a number of profiles in various newspapers and magazines.<sup>69</sup> Cobb published several articles about the College (Cobb, 1920, 1921, 1928a,

b, c), and he gave talks about fisheries to various clubs and organizations in Seattle as well as towns in outlying areas.<sup>70</sup> Cobb was also active in the community, holding membership in the Arctic Club of Seattle<sup>71</sup>, the Puget Sound Academy of Science, and the Aquarium Society of Seattle, where he served as founding president.<sup>72</sup> All of these social engagements served as a focal point for the College and for Cobb.

A “Fisheries Club” was established at the College (Fig. 8). Meetings of the Club served as a way for students to meet those in the fisheries industry and “smokers” were hosted that were funded by the fishing industry (Anonymous, 1920). Annual banquets of the Club were also held.<sup>73</sup>

Because of his publications on Pacific salmon and Pacific cod (Cobb, 1911, 1916b, 1917), as well as his other fisheries papers, Cobb was known as a fine “statistician.” He was apparently an accurate compiler of fishery statistics. Charles Henry Gilbert (1859–1928) of Stanford University, the preeminent Pacific salmon expert of the era, recommended in 1919 that the U.S. Bureau of Fisheries contract with Cobb to develop a statistical system to record catches of Alaska salmon:

“I need say nothing to you concerning the qualifications of Professor Cobb, who was long an efficient agent of the Bureau. No one is better informed on all phases of the salmon fisheries of Alaska, no one enjoys more completely the confidence of the cannery men, and no

one with whom I am acquainted is a more reliable statistician.”<sup>74</sup>

While Dean, Cobb undertook work for his former employer, the Alaska Packers Association (APA). He provided APA yearly salmon pack estimates and other information to the company from 1920–1929. Cobb apparently did not want his consulting work to be known to the U.W., as his letters to APA were marked “confidential” and the Association sent letters to Cobb at the latter's private residence.<sup>75</sup>

Cobb apparently had a reputation as possessing a “strong personality” (Stickney, 1989).<sup>76</sup> He apparently antagonized the faculty, but the latent hostility of the professors did not surface until Cobb's incapacitation in 1929. In a 10-page memorandum titled “Confidential: Conditions at the College of Fisheries” and signed, “Staff,” the authors laid out a series of complaints against the Dean.<sup>77</sup> The authors wrote that the College had lost prestige, mainly since 1925, due to the Dean's activities. They detailed Cobb's work on passage of salmon over dams when he was unqualified to do so because he lacked training as a scientist and was neither a biologist nor an engineer. The writers criticized the self-promotion of the College, asserting that much of it was false. The complaints continued: faculty meetings had never been held in the College; the College's library was

<sup>66</sup> Cobb to F. E. Bolton, Director of Summer Quarter, dated U.W., 8 Nov. 1921. Bolton to Cobb, dated U.W., 12 Nov. 1921. University of Washington Archives, Accession No. 74-6, Box 19, Folder 2, Schedule Committee. Ichthyology was not listed in the U.W. course catalogs for the Puget Sound Biological Station at Friday Harbor from 1922–1930.

<sup>67</sup> For example, see Cobb to Deans David Thompson and F. M. Padelford, dated U.W., 9 Apr. 1929. University of Washington Archives, Accession No. 1595-6, Box 5, Folder 2, outgoing letters 1905–1929. See also footnote 87. It is unclear how the launch was obtained. University of Washington Archives, Accession No. 1595-6, Box 21, Folder 5.

<sup>68</sup> There are literally hundreds of newspaper clippings about the College and fisheries in the Cobb papers. See University of Washington Archives, Accession No. 1595-6, Box 20, Folder 6; Box 21, Folders 1–10; Box 22, Folders 1–7; and Box 23, Folders 1–6.

<sup>69</sup> University of Washington Archives, Accession No. 1595-6, Box 1, Folder 1; Box 21, Folder 1; and Box 22, Folder 4, among others.

<sup>70</sup> For example, Cobb gave 27 talks to various audiences during 1927. University of Washington Archives, Accession No. 1595-6, Box 1, Folder 1.

<sup>71</sup> University of Washington Archives, Accession No. 1595-6, Box 2, Folder 22. “A” 1914–1927.

<sup>72</sup> University of Washington Archives, Accession 74-6, Box 2, Folder 22.

<sup>73</sup> “Smokers” were get-togethers of students, faculty, and industry or governmental personnel, for food and entertainment (and, likely, the smoking of cigars). On 4 Mar. 1927, the Fisheries Club held its seventh annual banquet in the main dining room of the L. C. Smith Building in downtown Seattle. Seven commercial fishing companies made contributions to the costs. Ten speakers were featured, including Professors Cobb and Kincaid. University of Washington Archives, Accession No. 1595-6, Box 9, Folder 1. Cobb diary for 1926–1927, p. 70, dated 4 Mar. 1927.

<sup>74</sup> Gilbert to Henry O'Malley, dated Stanford, 4 Oct. 1919. National Archives Record Group 22, U.S. Fish and Wildlife Service, Entry 91. Records and Reports of the Division of Alaska Fisheries, File 56, Correspondence of Gilbert and O'Malley, 1919. Gilbert's recommendation was apparently not accepted by the Bureau. For more on Gilbert, see Dunn (1997).

<sup>75</sup> APA paid Cobb \$500 a year from 1920–1929 to provide the Association with salmon pack statistics by cannery for all of Alaska. University of Washington Archives, Accession No. 1595-6, Box 1, Folders 6 and 7 and Box 3, Folder 4.

<sup>76</sup> Stickney (1989) gave examples of Cobb's “strong personality.”

<sup>77</sup> University of Washington Archives, Accession No. 71-34, Box 122, Folder 6. The memorandum is undated, but was likely written in the Fall of 1929, as Cobb died on 13 Jan. 1930. The first page of the memorandum contains an additional sub-heading “The following are in no way to be considered as charges—no proof is offered—, merely opinions as to causes of a condition commonly known to exist.”



Figure 8.—Fisheries Club, 1921. Cobb is in the top row, fifth from right. University of Washington Archives, Cobb negative no. 15485.

primarily for the personal use of the Dean; suggestions by faculty or students for new courses or improvements to the offered courses were ignored by the Dean; student scholarships were not available; equipment purchases were made solely by the Dean and were poorly chosen; and the faculty was discouraged and unhappy. The summation of this memorandum listed the actions taken by the faculty to correct these faults in the absence of Dean Cobb. Whether or not this note was shown to the next Director is not known.

#### **Cobb and Research at the College**

After spending some time in the University system, Cobb became aware

that the College was not held in high esteem by many of his colleagues, likely because of its applied emphasis and lack of scholarly endeavor. Cobb initiated three actions possibly designed to counter some of this criticism. In 1924 he began a research program on the passage of salmon over dams in which he was the sole investigator, he initiated in 1925 a journal of the College titled “*U.W. Publications in Fisheries*,” and he hired a trained ichthyologist to teach and conduct research.

What became the first major battle of “fish v. dams” in the Pacific Northwest arose in 1924, when the Priest Rapids hydroelectric dam was proposed for

the main stem of the Columbia River in eastern Washington. Cobb became the initial spokesman for the opposition, working with the directors of the fish and game agencies of Oregon and Washington, the salmon canners, sportsmen, and others opposed to the blocking of anadromous runs of Pacific salmon (Cobb et al., 1924).<sup>78</sup> This was the era before the advent of the “environmentalists,” and

<sup>78</sup> Henken (see footnote 2) reviewed the background of the Priest River controversy and Cobb’s venture into fish passage research. The account presented here is largely based on Henken’s manuscript. Cobb earlier reviewed some of the problems inherent in protecting migrating salmon (Cobb, 1922).

the opposition to hydroelectric dams on major rivers in Oregon and Washington was led mainly by those affiliated with commercial fisheries. According to Mighetto and Ebel (1994), "During the 1930's, relatively few Northwesterners objected to the construction of hydroelectric dams on the Columbia River. Vehement protests of large-scale dams would emerge in later decades." Robbins (1996) wrote that "As a group, the constituencies opposed to the dams were overwhelmed and politically impotent compared to the massive influence of metropolitan chambers of commerce, development interests, public power advocates, farmers, and a panoply of other promoters."<sup>79</sup>

Cobb, at first, was strongly opposed to the construction of these dams, but the Chairman of the U.W. Engineering Department apparently convinced him that passage of fish over high dams was feasible. If such passage was possible, then cooperation with those advocating hydroelectric projects could lead to fish passage facilities and, hopefully, ensure that the salmon resource would not be adversely impacted.<sup>80</sup> The companies involved in constructing the proposed dam would likely finance the required research on fish passage.

Cobb arranged for a conference on the subject of fish passage over high dams to be held at the U.W. in May 1924. The conference resulted in the formation of a committee composed of Cobb and representatives of the Oregon Fish Commission, the Washington State Fisheries Commission, and three members of the Northwest Electric Light and Power Association (NEPL), whose task was to plan research operations and formulate a budget to carry out the investigations. This Committee subsequently placed Cobb in charge of the fish passage research. A budget of \$5,000 was devised with the NEPL responsible for 50% of the costs and the Oregon and Washington

fisheries agencies splitting the remainder of the budget.<sup>81</sup>

Thus Cobb, with great confidence, but without education in the scientific method, with little knowledge of the biology of salmon, and lacking a background in engineering, decided to devise a method of passing salmon over dams. He approached this task by designing a mechanical lift, based on a principal somewhat similar to an escalator, to lift salmon over dams.

Cobb intended to lift the salmon in a wire basket, without keeping them submerged in water, over the dam and drop them back into water on the upstream side of the dam; he apparently felt that the salmon could easily survive out of water for the time it would take to lift them. He did not, apparently, seek technical assistance either from engineers or biologists for his fish passage research. A Seattle firm was contracted to build the device.<sup>2</sup>

The lift was tested on 23–24 September 1924 at the 100-foot high Condit Dam on the White Salmon River in Eastern Washington (Fig. 9). Unfortunately, migrating salmon could not be enticed to enter the wire basket and, because of the murky water present, fish could not be detected when they in fact entered the basket (Fig. 10). Tests were repeated in 1925 with similar results. Salmon would not approach the basket, and Cobb's venture was a failure.<sup>2</sup>

Cobb published reports that generally gave a favorable view of his research on fish passage (Cobb, 1925a, b; 1927). He also included a brief and favorable summary of his fish passage research in his review of the activities of the College (Cobb, 1928a). Cobb early on was recognized by some as an expert in fish passage.<sup>82</sup> However, he was the subject of bad publicity in the newspapers and the committee formed to support his research dissolved in 1925 (e.g. Anonymous, 1924).<sup>2</sup>

Cobb's research on fish passage was also the subject of the first section of the memorandum of complaint by faculty of the College of Fisheries:<sup>77</sup>

"In 1925 application was made for a permit to construct a certain high dam at which various agencies interested in the conservation of our fisheries, led by the Dean of the College of Fisheries, registered great protest. The Dean was placed in complete charge of the experimental work to find a means of insuring safe passage for the salmon over the dam, and while the problem was one for a biologist and engineer, no one from the College of Fisheries except the Dean, who is not a biologist, was allowed to participate in the work.

"A preliminary report was issued carrying such evidence of success that the way was apparently paved for the issuance of a permit for the construction of the dam with a very low liability clause for damage to the fisheries. Local fishery interests resented deeply this right-about-face and apparent selling out of their cause and have but little to do with the College of Fisheries since.

"Most of the experimental work performed has been termed a failure and is now resulting in the loss of a valuable salmon run. United States Commissioner of Fisheries O'Malley, Pacific Fisherman, Dr. Henry Baldwin Ward, biologist, have been free with criticism—the College of Fisheries Staff, who have had nothing to do with the matter, suffering with the institution."

In 1925, the College established an "in-house" journal named *University of Washington Publications in Fisheries*.

<sup>79</sup> Taylor (1999) reviewed the history of hydroelectric projects in Oregon and Washington and their relation to Pacific salmon.

<sup>80</sup> Henken (see footnote 2). Lichatowich (1999) described some of Cobb's opposition to the construction of high dams on the Columbia River. Cobb also was an early doubter of the efficacy of hatcheries as a panacea for salmon restoration (Lichatowich, 1996).

<sup>81</sup> Henken (see footnote 2). Cobb was also to be given a salary by the committee of \$500 a month, plus expenses, to conduct the research, a sum larger than his monthly salary at the U.W. Apparently this fee was never paid and the Oregon Department of Fisheries had trouble paying its share of the research assessment.

<sup>82</sup> W. C. Leighton, Washington Irrigation and Development Company, to Cobb, dated Seattle, 24 May 1924: "In all of the conferences with the various engineers I have stated the arrangements that were made subsequent to the recent salmon conference at Seattle and given your name as foremost authority on the subject." University of Washington Archives, Accession No. 1595-6, Box 4, Letters concerning fishways, 1921–1929, Folder 11.



Figure 9.—Fish hoist [ca. 1924]. University of Washington Archives, John N. Cobb photographs, Collection no. 418, Box 5, Folder 183, print no. 5010.



Figure 10.—Fish passage basket [ca. 1924]. University of Washington Archives, John N. Cobb photographs, Collection no. 418, Box 5, Folder 183, print no. 5098.

The organ was issued in volumes and in 1927 a series of “Special Bulletins” was begun. Of the first 15 titles published, all by members of the College faculty, most dealt with the commercial aspects of the fishing industry.

In the late 1920’s, Cobb planned to create a Department of Ichthyology that would be “separate” from the applied courses in the College. In 1927, he began to search for a qualified ichthyologist to teach, conduct research, and to begin a systematic fish collection in the College.<sup>83</sup> After a nation-wide search, Cobb selected Leonard Peter Schultz (1901–1986) whom Cobb had met in 1926.<sup>84</sup> Schultz had received an M.S.

<sup>83</sup> Cobb to Schultz, dated U.W., 26 Apr. 1927: “I have in mind the development of a separate department of ichthyology (it is now combined with that of fish culture)...” Smithsonian Institution Archives, Leonard Peter Schultz papers, Record Unit 7222, Box 15, Folder 12.

degree at the University of Michigan where he studied under the well-known ichthyologist Carl Leavitt Hubbs and, in 1927, was teaching zoology at the Michigan State Normal College at Ypsilanti.<sup>85</sup> Schultz was apparently planning to pursue a Ph.D. degree in ichthyology at the University of Michigan.<sup>86</sup>

<sup>84</sup> For a discussion of Cobb’s plans about a “Department of Ichthyology,” as well as additional information on the tenure of Leonard Schultz at the U.W., see Dunn (2003), “Seventy-five years a gathering: The University of Washington fish collection, 1928–2002.” [http://www.U.W.fishcollection.org/Geninfo/U.W.fc\\_history/Schultz.htm](http://www.U.W.fishcollection.org/Geninfo/U.W.fc_history/Schultz.htm).

<sup>85</sup> Telegram, Cobb to Schultz, dated U.W., 10 May 1928: “Are you in position to consider offer of Ichthyology position College of Fisheries.” See also Cobb to Schultz, dated U.W., 18 May 1928, and Schultz to Cobb, dated U.W., 24 May 1928. Smithsonian Institution Archives, Record Unit 7222, Box 15, Folder 12. Hubbs (1894–1979) became a preeminent ichthyologist of North America (Miller and Shor, 1997).

Cobb hired Schultz in 1928 as an instructor with a salary of \$2,500. Schultz was to teach ichthyology, another course to be called “Problems in Ichthyology” that he was to devise, and to participate in seminars. He was also expected to complete his doctoral degree, after which he would be promoted to assistant professor. Schultz moved to Seattle in the fall of 1928 and immediately began to teach and to assemble a research collection of fishes (Fig. 11).<sup>84</sup>

<sup>86</sup> Leonard Peter Schultz interview, 1976. Smithsonian Institution Archives, Record Unit 9510, p. 4. Schultz to Richard Van Cleve [n.d., but ca. 1980], Port Republic, Maryland. School of Aquatic and Fishery Sciences Archives, “Flagship” papers, Box 3.3.1, No. 3 “photocopies.” Schultz completed his doctorate in 1932 in the U.W. Department of Zoology (Schultz, 1933). He remained at the U.W. until 1937, when he accepted a position with the U.S. National Museum, Smithsonian Institution, Washington, D.C., at an increase in salary.



Figure 11.—Ichthyology class, ca. 1920. Trevor Kincaid is standing to the right at the rear of the room. University of Washington Archives, U.W. 15345.

Dean Cobb and Schultz had great hopes for the future of ichthyology at the College. Schultz, as instructed by Cobb, planned new laboratories for the study of fishes as well as for storage space for the growing fish collection. In a 1928 proposal from the College for “Equipment for Proposed New Fisheries Building,” Schultz asked for 4 tables and 25 chairs to accommodate 20 people in the “Library of the Ichthyology Department,” in just one aspect of the initiative.<sup>87</sup> However, nothing became of these initiatives.

These activities were apparently sufficient to enable Cobb to remain as Dean of the College (Fig. 12). They were inad-

equately, however, to ensure the continuation of the College upon his demise.

#### The Demise of Cobb and of the College

John Nathan Cobb suffered from heart disease and endured a heart attack in the summer of 1929. He was ill for many months and spent his final days in the warmer climate of La Jolla, Calif., where he died on 13 January 1930 at the age of 61 (Schultz, 1930; Stickney, 1989). His death was prominently noted in local newspapers and in numerous fisheries publications.

Leonard Schultz (1930), in an obituary of Cobb, praised him for his work in establishing the College and noted his “concentration and unremitting effort that marked his career...” The *University of Washington Daily* wrote of him as a “Leader” who had a “Brilliant Career” (Anonymous, 1930a). *Pacific Fisherman* called him “a firm friend and indefatigable worker for its [fishing industry]

advancement (Anonymous, 1930b), and the *Fishing Gazette* called Cobb a “Fisheries Authority” (Anonymous, 1930c). A memorial service was held on the U.W. campus and Professor Henry Landes noted Cobb’s “strong personality that influenced his students in a wholesome way and endeared him to those colleagues who knew him best.”<sup>88</sup> His funeral was held in Seattle on 22 June 1930 at University Undertaking Parlors.

Shortly after Cobb’s death, the new Governor, Roland Hill Hartley (1864–1952), fired U.W. President Suzzallo and replaced him with Matthew Lyle Spencer (1881–1969), the former Dean of the College of Journalism. Spencer sought scholarship and high academic standards at the U.W., and he did not think highly

<sup>87</sup> Schultz to Cobb, dated U.W., 12 Oct. 1928. University of Washington Archives, Accession No. 74-6, Box 23, Folder 28. Cobb argued to the U.W. administration for additional space for the Fish Collection “for storing our rapidly growing and valuable scientific collection of preserved specimens fishes [*sic*], and the housing of our research students in ichthyology.” See also footnote 67.

<sup>88</sup> Statement by Henry Landes. Memorial Exercises, Meany Hall, 27 May 1930. University of Washington Archives, Accession No. 1595-6, Box 1, Folder 2.

**Table 5.—Course offerings in the Department of Fisheries at the University of Washington during the academic year 1931–32 (Stickney, 1989).**

Course no.	Title	Instructor
101, 102, 103	Systematic Ichthyology	Schultz
105, 106, 107	Commercial aquatic invertebrates	Schultz
125, 126, 127	Early life history of fishes	—
154	Diseases of fish	Guberlet
120	Exploration of the sea in its relation to fishes	—
157, 158	Later life history of fishes	Schultz
159	Conservation	Thompson
165, 166, 167	Elementary problems	Thompson, Schultz
195, 196, 197	Seminar	Staff
201, 202, 203	Research	Thompson
205, 206, 207	Graduate seminar	Thompson

of the College of Fisheries. Apparently, courses in canning and fishing methods did not meet the new President's criteria of scholarship. As a result, the College was dissolved in April 1930 and all faculty of the College were dismissed, except for Leonard Schultz who was apparently considered a bona-fide academic and was assigned to a position in the new College of Science (Stickney, 1989).<sup>89</sup>

Uproar occurred among the students in the College who now faced a situation wherein they now had no major field. They sent a telegram to Governor Hartley protesting President Spencer's actions stating, in part, [your action] "Protested by unanimous action of fisheries students." Upon his inquiry of the U.W., Governor Hartley was told that the Board of Regents had created a new College of Science and had elected to consolidate the College of Fisheries as a Department in the new College (Stickney, 1989).<sup>90</sup>

A new Director was appointed for the Department in the person of William Francis Thompson (1888–1965), who was to become the dominant figure in the U.W. Department (later, School) of Fisheries for over 16 years and the pre-eminent fishery scientist of the Pacific Northwest for nearly 40 years.<sup>91</sup> Thompson had offices in the College of Fisheries

where, since 1925, he was Director of the International Fisheries Commission (now International Pacific Halibut Commission) charged with the management of, and research on, the Pacific halibut, *Hippoglossus stenolepis*, fishery.<sup>92</sup> He had just received his Ph.D. from Stanford University where he was trained by the

<sup>90</sup> Governor Roland H. Hartley to President M. Lyle Spencer, dated Olympia, 7 Apr. 1930 "Am handing to you herewith a telegram from 'Fisheries Students, University of Wash., received this morning, which will explain itself. I will thank you for any information you may see fit to give me regarding the situation. Please return the telegram." David Thompson, Dean of Students, to Governor Hartley, dated U.W., 8 Apr. 1930. "For many years the University, as you may be aware, has held the apparent distinction of possessing the only College of Fisheries in the United States. Under the direction of the late John N. Cobb, dean of the college from its inception until his recent death, the fisheries work became widely known, giving the University publicity in many countries of the world.

Of late years it was felt, however, that the fisheries work was not organized in such a way as to permit instruction of a sound scientific nature; that too much of the students' time was devoted to the study of technology work which too closely paralleled work in the fishing industry." University of Washington Archives, Presidents Office Records, Accession No. 71-34, Box 122, Folder 5. The College of Science is first listed in the U.W. Catalog for 1930–1931, p. 105–120. A Department of Fisheries in the College of Science is first found in the Bulletin of the U.W. Catalog for 1931–1932 Sessions, General Series No. 300, p. 286–287. The Department of Fisheries was elevated to a School of Fisheries in the U.W. Catalog for 1934–1935, General Series No. 380, p. 192–193. University of Washington Archives.

<sup>91</sup> Thompson to M. Lyle Spencer, President, dated International Fisheries Commission, 7 Aug. 1930; Spencer to Thompson, dated U.W., 8 Aug. 1930; Thompson to Spencer, dated International Fisheries Commission, 8 Sept. 1930 (with attached draft employment agreement); and Spencer to Thompson, dated U.W., 9 Sept. 1930. University of Washington Archives, President's files, Research Unit 71-34, Box 122, Folder 6.



Figure 12.—John N. Cobb [ca. 1920's]. University of Washington Archives, COB 181.

two preeminent figures in fisheries of the era, Charles Henry Gilbert and David Starr Jordan. Thompson was appointed Research Professor and Director of the new department on a part-time basis, as he remained Director of the International Fisheries Commission. He remained Director of the school until 1947 when he resigned to establish and head the U.W.'s new Fisheries Research Institute (Stickney, 1989; Dunn, 2002).

Thompson instituted an entirely new approach to fisheries education at the U.W., concentrating on the emerging field of fisheries science. He revised the curriculum to emphasize basic science (Table 5) and not the technology of the

<sup>92</sup> The International Fisheries Commission was established in 1923 by treaty between the United States and Canada and charged with conducting research on the halibut and regulating the fishery on this species. This treaty was the first international attempt to conserve and replenish a marine fishery. The Commission was renamed the International Pacific Halibut Commission in 1953. For more on the Commission, see Bell (1981).



Figure 13.—Dean Cobb [ca. 1920's]. University of Washington Archives, U.W. 9944.

commercial fishing industry.<sup>93</sup> To the present the School of Fisheries has continued the emphasis on fishery science and on graduate study (Stickney, 1989).

### Summary

John Nathan Cobb (Fig. 13), with little formal education but with great

<sup>93</sup> William F. Thompson (see footnote 57) was critical of Cobb in a draft "History of the School of Fisheries" written many years after Cobb's death: He felt that the concept upon which Cobb developed the School was at fault: "...It may also have been responsible for the failure of the College to develop distinctive lines of fundamental research, as he had no concept of the character and extent of work which such research required."

ambition and self-education, rose from being a printer's aide to become in 1919 a Professor and founding Director of the College of Fisheries, University of Washington, Seattle. He was one of the last who could attain such a position without the benefit of at least one college degree. Cobb's story is one of the "American ideal," based on hard work and unrelenting pretension that led him to become a recognized expert in fisheries.

Cobb was highly regarded by his peers in the commercial fishing industry and by some of the leading scientists of the day. He began his career in fisheries with the U.S. Fish Commission in 1895 where he learned much about commercial fisher-

ies in various regions of the country, the Northeast, Great Lakes, South Atlantic, and Gulf of Mexico, Alaska, and Hawaii, that served him well. His training in fisheries statistics made him particularly adept at compiling data. His publications about fisheries often provided the first written information about the subject. In particular his publications on fisheries for Pacific salmon (Cobb, 1911) and Pacific cod (Cobb, 1916b) provided the basic documentation for these west coast enterprises and for many years were held in high esteem by people in the fishing industry.

As an ambitious, self-described "economic-man," Cobb left the Federal

service mainly to improve his financial situation.<sup>94</sup> He entertained the possibility of returning to the Federal Service even as he was leading the College of Fisheries. There are several letters in the U.W. Archives about Cobb's potential candidacy for Director of the Bureau of Fisheries. In a telegram from William Timson to Cobb, dated San Francisco, 21 February 1922, Timson sought confirmation that Cobb was available for appointment as Commissioner of Fisheries. Cobb wrote Miller Freeman, "Have wired Timson will accept Commissionship if tendered me."<sup>95</sup> Timson then wrote to Cobb "the APA and I, personally, had hoped that you would be the next Bureau [Fisheries] Chief, but that you had stated positively that you did not want it..." Thus, Cobb's willingness to become head of the U.S. Bureau of Fisheries did not come to fruition and, indeed, it appears Cobb was never offered the position.

Cobb deserves credit for his establishment and leadership of the U.W. College of Fisheries, the nation's first. His worldview of fisheries led him to establish a College devoted principally to the technology of the commercial fishing industry.<sup>96</sup> Cobb's original ideas about the

format of the College were accepted by the U.W. administration, likely because they largely coincided with the ideas put forward earlier by Professor Trevor Kincaid and endorsed by Commissioner Hugh M. Smith of the U.S. Bureau of Fisheries.<sup>38</sup> He was a vigorous advocate for the development of the College. Cobb became aware that the College needed to improve its reputation among the faculty and administration of the U.W., but his time ran out before he could fully develop a scientific program.

Cobb's area of technical weakness became apparent when he tried to design fishways to pass salmon over high dams. His lack of scientific training, his inadequate knowledge of salmon biology, and his failure to seek both engineering and biological help in his fish passage research are partial reasons for the failure of his ill-conceived studies. Cobb's strong personality endeared him to the commercial fishing industry, but likely caused friction with the scientifically trained faculty of the College. He brought publicity to the College that was welcome to the U.W.

Upon Cobb's passing, the U.W. was fortunate to have on campus William F. Thompson, whose scientific stature was increasing. Thompson's worldview of fisheries was based on science, rather than the commercial fishing industry. His views have stood the test of time as they are largely in effect today at the School of Aquatic and Fishery Sciences at the U.W.

#### Acknowledgments

I thank T. W. Pietsch, School of Aquatic and Fishery Sciences (SAFS), U.W., for helpful discussions in the preparation of this manuscript, for his generosity in providing help, and in critically reviewing a draft of this paper. Marcus Duke, SAFS, kindly made the SAFS archives available for my use. Fred Utter (SAFS) brought to my attention the manuscripts by Joanne Webb and Dave Henken. The U.W. Manuscripts, Special Collections, and University Archives allowed me to use the John N. Cobb papers and photographs, and offered me other help.

William Cox, Smithsonian Institution Archives, Washington, D. C., kindly

provided copies of the Cobb papers in his archives. Kirsten van der Veen of the Dibner Library of the History of Science & Technology, Smithsonian Institution, Washington, D.C., also provided copies of Cobb letters.

I thank Willis Hobart, National Marine Fisheries Service, Seattle, for providing me with historical information about fisheries. His extensive knowledge of fisheries history is a valuable resource that is freely shared with others.

Through the power of the Internet, Honor Conklin, a great granddaughter of John Cobb's brother, Samuel George Cobb (1864–1934), became aware of this project and contacted me. She kindly furnished me with information about the Cobb family, provided photographs of John Cobb, and demonstrated keen interest in the history of the Cobb family. I am indebted to her for assistance in this project.

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<sup>94</sup> Cobb had catholic interests. In addition to his interest in fisheries, fisheries history, and photography, he was a prolific writer who submitted many articles on natural history and other subjects to magazines and newspapers. The U.W. Archives contain a notebook listing the non-fisheries articles he submitted for publication. The notebook indicates whether or not the article was accepted and, if so, how much he was paid. He also visited cemeteries in various cities to view the headstones of famous people interred there, and kept records of his visits. U.W. Archives, Accession No. 1595-6, Box 9, Folder 6 and Box 10, Folder 5.

<sup>95</sup> University of Washington Libraries, Accession No. 1595-6, Box 1, Folder 7. Freeman to Cobb, dated Seattle, 21 Feb. 1922. Cobb to Freeman, dated Seattle, 23 Feb. 1922. University of Washington Libraries, Accession No. 1595-6, Box 1, Folder 30. Timson to Cobb, dated San Francisco, 23 Feb. 1922: University of Washington Archives, Accession No. 1595-6, Box 1, Folder 6.

<sup>96</sup> Twenty years after Cobb's death, the U.S. Fish & Wildlife Service (the successor agency to the U.S. Bureau of Fisheries) recognized Cobb's contributions to fisheries by naming a research vessel after him. The RV *John N. Cobb* was commissioned on 18 Feb. 1950 and, based in Seattle, continues as a research platform some 54 years later. For more on the RV *John N. Cobb*, see <http://www.afsc.noaa.gov/Quarterly/ond99/html/items.htm>.

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