

Stanford University's John Otterbein Snyder: Student, Collaborator, and Colleague of David Starr Jordan and Charles Henry Gilbert

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Introduction

For 80 years, beginning in 1891—the year that U.S. senator Leland Stanford's university opened under the leadership of its new president, David Starr Jordan (1851–1931)—there flourished such a productive and distinguished group of

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*ABSTRACT—John Otterbein Snyder (1867–1943) was an early student of David Starr Jordan at Stanford University and subsequently rose to become an assistant professor there. During his 34 years with the university he taught a wide variety of courses in various branches of zoology and advised numerous students. He eventually mentored 8 M.A. and 4 Ph.D. students to completion at Stanford. He also assisted in the collection of tens of thousands of fish specimens from the western Pacific, central Pacific, and the West Coast of North America, part of the time while stationed as “Naturalist” aboard the U.S. Fish Commission's Steamer Albatross (1902–06). Although his early publications dealt mainly with fish groups and descriptions (often as a junior author with Jordan), after 1910 he became more autonomous and eventually rose to become one of the Pacific salmon, *Oncorhynchus spp.*, experts on the West Coast. Throughout his career, he was especially esteemed by colleagues as “a stimulating teacher,” “an excellent biologist,” and “a fine man.”*

ichthyologists and fisheries biologists in the Department of Zoology, that they were known as the “Stanford School of Ichthyology.” (Brittan, 1997). Many of his newly hired faculty, chief among them Charles Henry Gilbert (1859–1928) (Dunn, 1997), had been students and, later, colleagues of Jordan when he had been professor and president at Indiana University from 1885 to 1891.

Of the earliest Stanford students, two who soon became members of the Stanford zoology faculty were John Otterbein Snyder (1867–1943; Fig. 1) and Edwin Chapin Starks (1867–1932). Although a considerable amount has been written about Jordan and Gilbert and their students (Jordan, 1922; Myers, 1951; Brittan, 1997; Dunn, 1997), virtually nothing has been written about Snyder save three short obituaries in scientific journals that appeared soon after his death (Hubbs, 1943; Rich, 1943; Taft, 1944). In this paper, we describe some of Snyder's fisheries work, both in marine and freshwater environments, and his collaboration with Stanford faculty and students. In doing so, we hope to provide an idea of the mixing and exchange of people and ideas at Stanford University that provided the solid basis for our understanding of regional fish faunas in parts of the Pacific Ocean and the American West.

Biographical Overview

Snyder, like so many of Jordan's early students, was a native Indianan (born in Butler on 14 Aug. 1867) and received his early education in the state (Hubbs, 1943; Rich, 1943). Upon his graduation from high school in 1888, he taught

public school for 2 years at Cedar Lake, Ind., but soon after decided to further his education (Anonymous, 1943). Thus, after a year as a student at the University of Indiana during 1890–91, he followed Jordan to Stanford as an undergraduate student (Rich, 1943). Snyder attended Stanford during 1892–93 (Fig. 2), was Superintendent of Schools at Pullman, Wash., from 1893 to 94 (to earn money for his undergraduate education), and again was a student at Stanford during 1894–97 (Anonymous, 1910; 1943). He graduated with a Bachelor of Arts degree in 1897, and soon after, was awarded the Master of Arts degree in 1899, with Gilbert as his major professor (Brittan, 1997).

Jordan had immediately appointed Gilbert as head of the department in 1891, upon the opening of the university, a position he held for 34 years until he retired in 1925, to be succeeded by Snyder (after the latter's 1-year stint as Director of the U.S. Bureau of Fisheries Laboratory at Woods Hole, Mass.), who served until his own retirement in October 1931 (Brittan, 1997). The hiring of Snyder to replace Gilbert was apparently hastened as a result of Gilbert's ill health due to overwork from his many university duties and government research studies (Dunn, 1997)

After Snyder's university retirement, he was named Chief of the Bureau of Fish Propagation for the California Division of Fish and Game, in charge of all of California's trout and salmon hatcheries (Anonymous, 1943; Taft, 1944). Under Snyder's leadership a number of river surveys were carried out, and the bureau expanded to become the Bureau of Fish

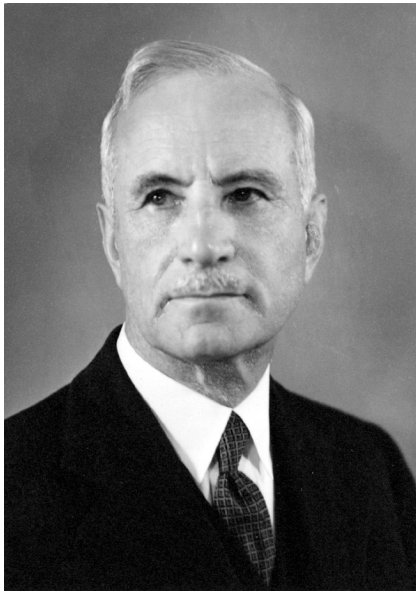


Figure 1.—John Otterbein Snyder, ca. 1935. Original photo courtesy of Stanford University Archives.

Conservation. In ill health, Snyder retired in 1937, and he died on 19 August 1943 at age 76 (Taft, 1944).

Field Work

Jordan had long been an organizer of collection expeditions, using students, many of whom, like Gilbert, Barton Warren Evermann (1853–1932), Seth Eugene Meek (1859–1914), and Carl “H.” Eigenmann (1863–1927), later became well-known ichthyological colleagues (Hubbs, 1964). During 1896–97 Jordan took young Snyder with him to collect specimens in central México, and in 1900 they went to the Hawaiian Islands and Japan, making very large collections (Jordan, 1922). This work was perhaps the first extensive use of Formalin in the field to preserve fishes (Brittan, 1997).

In 1902 came the first of the many trips made by Stanford ichthyologists on the U.S. Fish Commission’s steamer *Albatross* (Fig. 3), this to the Hawaiian and Laysan Islands; in the huge collections were 210 new species, later described by Gilbert (Dunn, 1996a; 1997). The *Albatross*, in 1906, subsequently made a trip to Japan, the



Figure 2.—John Otterbein Snyder and some classmates at Stanford University during the 1893–94 academic year. They are (from left in lower row): Walter Robert Shaw, DeAlton Saunders, Stewart Daniel Briggs, Charles J. Pierson, Frank Jotham Snow, William Appleton “Dick” Snow, and William Freeman Snow; from left in upper row: Cloudsley Louis Rutter, John Otterbein Snyder, three unidentified women, John Adams Colliver, Ray Lyman Wilbur, Edwin Lincoln Reichenbach (surname changed to “Russell” during World War I), and Richard Crittenden McGregor. The original caption reads: “And they all laughed.” Original photo courtesy of Richard R. Rutter.

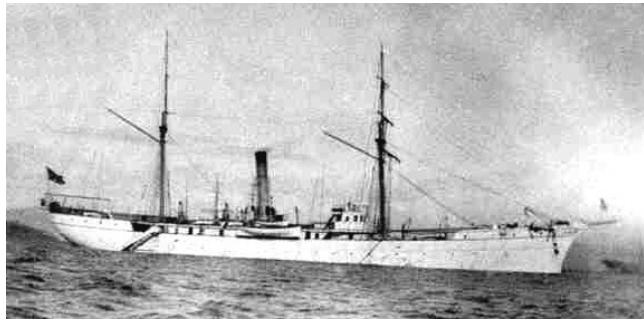


Figure 3.—The Fisheries Steamer *Albatross* in Alaska waters near Kodiak Island in May 1903. Original photo courtesy of Richard R. Rutter.

Ryukyus, Kamchatka, and the Aleutian Islands, with Gilbert, Snyder, and Walter Kenrick Fisher (1878–1953) aboard, again making large collections (Dunn, 1996b; Jordan, 1922).

The *Albatross* cruises, with many of the trips staffed by Stanford scientists (during which time Snyder was appoint-

ed as “Naturalist” to oversee the collection and preservation of vast numbers of fish specimens), were financed by the U.S. Fish Commission and the U.S. National Museum, with the latter receiving the primary type material and some secondary type material, as well as much nontype material and Stanford getting

secondary types and some primary types (out the cotype-syntype series), and a substantial part of the remainder. Both the U.S. National Museum and Stanford University exchanged specimens with other museums from around the world (Brittan, 1997). Snyder's appointment as Naturalist aboard the *Albatross* during 1902–06 brought him in close collaboration with the Resident Naturalist of the ship (the individual responsible for managing the daily activities of scientific studies conducted on board or delegated field work on shore such as salmon spawning stream surveys or freshwater fish collections)—established government scientists such as Henry Frank Moore (1867–1948), Cloudsley Louis Rutter (1867–1903), and Frederic Morton Chamberlain (1867–1921) (Hedgpeth, 1945; Jennings, 1987). Interesting enough, Rutter was actually a classmate of Snyder's at Stanford and received some wise instruction and counsel from Snyder on collecting scientific specimens while Rutter was working on Kodiak Island in Alaska during 1896–97 (Anonymous, 1896; Jennings, unpubl. data).

The work by Snyder and others aboard the *Albatross* cannot be underestimated, especially in light of the breadth and depth of natural history specimens collected in the east and west Pacific Ocean that are now housed in various museums. Their labors were physically demanding, not only from handling sampling gear under harsh environmental conditions and outbreaks of sea sickness which negatively affected many visiting scientists on board (Dunn, 1996a; Jennings, 1997), but also from the long hours sorting and preserving fish specimens, the many nighttime fish collections, and the sampling of specific transect stations conducted throughout the day and night (Bartsch, 1941). The loss of nets, trawls, dredges, and other sampling gear was not uncommon, although some of this gear was experimental and thus vulnerable to damage or loss (Jennings, 1987).

Further, there were often tensions on board between the naval officers in charge of the *Albatross* and the civilian scientists assigned to the vessel

(Hedgpeth, 1945; Dunn, 1996a; 1996b). During the 1980's and 1990's, additional tensions and conflicts have been discovered between the scientists themselves on the vessel (Jennings, 1987; Dunn, 1997; Jennings, unpubl. data). Such interactions can be expected by groups of people in such close contact day after day, with long hours working under very strenuous conditions and a tight budget and sampling schedule. Fortunately, Snyder's ever positive personality allowed him to avoid these challenges and, instead, focus his energies on collecting, preserving, and identifying new species of fishes.

In 1904, Snyder and Starks made a long trip by horseback to the lakes and streams of northeastern California and southeastern Oregon. This was the beginning of Snyder's extensive investigations of the fishes of California and other parts of the American West, and this continued for the rest of his life (Taft, 1944).

In 1909, Gilbert, Snyder, and Starks surveyed the streams entering Monterey Bay and, in 1911, Snyder and Charles Howard Richardson, Jr. (1887–1977), collected in the Lahontan Basin of Nevada and northeastern California (Böhlke, 1953). Snyder, assisted by the young Carl Leavitt Hubbs (1894–1979), later to become the "Grand Old Man of American Ichthyology," worked on the Lahontan cutthroat trout, *Oncorhynchus clarkii henshawi*, of Pyramid Lake, Nev., and its tributary Truckee River, flowing out of Lake Tahoe, on the California-Nevada border, in 1915 and 1916 (La Rivers, 1962). It was during this work (in the summer of 1915) that Snyder and Hubbs made an arduous 70-day collecting trip through the Bonneville Basin of Utah and Idaho, which Hubbs later referred to as "a trip from Heaven to Hell" (Miller and Shor, 1997). However, despite this strenuous trip, Hubbs and his son-in-law Robert Rush Miller (1916–2003) later became the greatest authorities on the fish faunas of both basins, and of North American desert fishes in general.

During subsequent years, Snyder investigated the fishes of the tributaries of San Francisco and Tomales Bays

on the central California coast; the coastal streams of northern California and Oregon; the Santa Ana and Mojave Rivers of southern California; Lake Tahoe; Owens River, east of the Sierra Nevada; and the San Pedro Mártir range of northern Baja California, describing several new species (Böhlke, 1953). Snyder developed a biogeographical way of looking at ichthyofaunas, which he passed on to Hubbs and George Sprague Myers (1905–1985), especially.

Publication Overview

As listed in Dean (1916, 1917), Snyder's publications from 1900 to 1909 were mostly as junior author to Jordan in an extensive series of reviews (about 35) of Japanese fish groups, mainly at the family level, although 6 of these were by Snyder alone, culminating in Jordan et al. (1913). These publications were based largely on *Albatross* collections. Snyder did most of the actual work on the specimens, since Jordan was developing an allergy to alcohol, later extending to Formalin, and had many other "irons in the fire" (Brittan, 1997). Snyder also published papers (a few with Jordan) on the fishes of Hawaii, Formosa (Taiwan), and Okinawa based on *Albatross* collections, but from 1908 on his papers were on California freshwater fishes, and in a few cases, those of Oregon, Washington, Idaho, Nevada, and Utah (Taft, 1944). Many of these publications include ecological and distributional information on fish species now listed by the U.S. Department of Interior as "Threatened" or "Endangered" (Minkley and Deacon, 1991; Behnke, 1992). Such information has been a great help to later resource managers attempting to save these species (Behnke, 1992).

Later Years

In 1914, Snyder was called to the Smithsonian Institution's U.S. National Museum in Washington, D.C., where he spent the year as "Expert Ichthyologist" to help catalog and to put his many *Albatross* fish collections in order (Rich, 1943). Although offered a permanent position there at the end of

his stay, Snyder declined and returned to Stanford to resume his teaching duties (Anonymous, 1943). However, he still remained a field assistant with the U.S. Bureau of Fisheries during the 1920's, ready to conduct any fisheries research in the American West that the Bureau felt needed to be handled by a competent scientist (Rich, 1943).

During 1917 through 1922, Snyder divided his time between teaching at Stanford (Taft, 1944), serving on the Palo Alto City Council (Rich, 1943), and being a member of the very important "Committee On Scientific Research Of The State Council Of Defense Of California" (Goodspeed, 1923). This group of distinguished scientists on the West Coast was originally part of the Pacific Division of the American of the Advancement of Science and had scheduled their annual meeting at Stanford on 5–7 April 1917.

However, with America's entry into World War I on 6 April 1917, their energies were immediately directed to the Committee mentioned above. This resulted in a number of important studies conducted on the potential of using noncommercial marine and freshwater fish, as well as other unutilized biological organisms for human consumption and for items directly related to increasing the domestic food supply for the war effort.

Snyder's role dealt largely with the Committee on Zoological Investigations where he conducted studies into the methods of preserving fish and other aquatic products. His initial studies were so promising, that they were subsequently transferred to the Nutrition Department of the University of California at Berkeley and to the U.S. Bureau of Chemistry (Goodspeed, 1923). One of the findings of this research resulted in the successful canning of tuna (Scombridae), which has subsequently become a commercially produced food product that is widely used today (at one time the 5th most common canned item present in the pantries of U.S. households).

From 1921 to 1931, Snyder investigated California Pacific salmon, *Oncorhynchus* spp., and steelhead trout, *O. mykiss*, fisheries, especially in the

Trinity and Klamath Rivers (Snyder, 1931), and detailed life history, results of transplant and homing experiments, and statistics of declining catches. He attributed the latter to the harmful effects of gillnetting, too many small salmon entering the markets, and the inability of hatcheries to make up for overfishing (Taft, 1944). By this time, Snyder was becoming one of the premier salmonid authorities of his day, and his knowledge was much sought by students, fisheries management professionals, and legislators interested in keeping these economically important fisheries viable for future generations.

As a teacher, Snyder served as Assistant in Zoology (1897–99), Instructor in Zoology (1899–1903), Assistant Professor (1903–11), Associate Professor (1911–25), and Professor and Department Head (1925–31) at Stanford (Fig. 4). He also was an Instructor at Hopkins Marine Station in 1907 and 1908. While serving in these capacities, he steered several dozen students into ichthyology, fisheries biology, and conservation work, and oversaw 8 M.A. and 4 Ph.D. students; all without the benefit of the booming post World War II years, as did later zoology professors such as Myers and Willis Horton Rich (1885–1972) [and later, Donald Eugene "Curly" Wohlschlag (1918–2007)]. It should be noted that Stanford never had more than about 2,500 students before World War II, although the student body was of exceptional quality (Brittan, 1997). Known as "J. O." by his students and colleagues, all held Snyder in the highest esteem as a teacher, a scientist, and as a man (Anonymous, 1943; Rich, 1943).

After officially retiring at Stanford in 1931, Snyder was appointed as Chief of the Bureau of Fish Propagation for the California Division of Fish and Game (Taft, 1944). As part of his duties, he served as editor of the quarterly journal *California Fish and Game* and consistently guided this publication to timely releases and high quality content through the funding challenges of the Great Depression. Further, his articles on the trout, *Oncorhynchus* spp., *Salmo* spp., and *Salvelinus* spp., of California

are still prized today by collectors for their useful information (Snyder, 1931), and their colorful illustrations (Snyder, 1933; 1940).

Snyder's leadership also resulted in a complete reorganization of the bureau along scientific lines (Rich, 1943; Taft, 1944). Because of his leadership position, a number of Stanford zoology students such as William Abbott Dill (1910–2000), Donald Hume Fry, Jr. (1905–76), Leo Shapovalov (1908–94), and Joseph Howe Wales (1907–2002), subsequently received their first professional job experience with the division. Indeed, upon his retirement, he left the administration of the bureau in the hands of a former graduate student [Alan Cowie Taft (1897–1975)] whom he had selected and trained especially for that work (Rich, 1943). Probably Snyder's most lasting legacy with the bureau (besides training and placing students), was the foresighted preservation of genetically pure stocks of native trout by planting them in isolated lakes of the Sierra Nevada so that they would be available for later generations to propagate and stock as management conditions warranted (Pister, 1990).

Personal Recollections

The senior author considers himself fortunate to have known well the ichthyologists Carl Leavitt Hubbs, Albert William Christian Theodore Herre (1869–1962), Rolf Ling Bolin (1901–1973), and George Sprague Myers, and the fisheries biologists Willis Horton Rich, William Abbott Dill, Donald Hume Fry, Jr., Leo Shapovalov, and Joseph Howe Wales, and, less well, Alan Cowie Taft, Frank Walter Weymouth (1884–1963), and Lionel Alfred "Bert" Walford (1906–1979), among others. All of these men were variously students, protégés, or colleagues of Snyder. Having sat in on many a "bull session" with my fellow Stanford M.A. and Ph.D. candidates—often at the Myers-Rich Stanford *Fischverein*, where many of these old-timers were attendees—they often talked about the "old days," and we graduate students were avid listeners to these gems of ichthyological and fisheries biology history. About John



Figure 4.—John Otterbein Snyder and the Stanford University zoology teaching staff at Hopkins Marine Station in 1924. From left in lower row: John Otterbein Snyder, Harold Heath, and George Clinton Price; from left in upper row, Edwin Chapin Starks, Walter Kendrick Fisher, and Charles Henry Gilbert. Original photo courtesy of Stanford University Archives.

Otterbein Snyder, the words we heard most often, in addition to his scientific contributions, were “a stimulating teacher,” “an excellent biologist,” and “a fine man.”

Lastly, Snyder was in the direct line of scientific descent from Baron Georges Leopold Cuvier (1769–1832), the most eminent naturalist of the Napoleonic and Bourbon periods of 18th-century France, considered the “Father of Comparative Vertebrate Anatomy,” viz., Snyder, Gilbert, Jordan, Louis Agassiz (1807–1873), and Cuvier—a great heritage indeed.

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