

SOURCES FOR THE STUDY OF BIOLOGY AT THE SCRIPPS INSTITUTION OF OCEANOGRAPHY

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Abstract

The Scripps Institution of Oceanography, University of California, San Diego in La Jolla, California is renowned for its work in physical oceanography, geophysics, atmospheric science, geochemistry and marine biology. Many historians have used the manuscript holdings of the Scripps Archives to write articles on the history of oceanography and marine biology. However, during its early years, the Scripps Institution was a biological station with a broad research program that included a major project in genetics. The institution was known as the Scripps Institution for Biological Research of the University of California between 1912 and 1924. Biological research ended abruptly in 1925 when the focus of research was changed from biology to oceanography and the name of the institution was changed to the Scripps Institution of Oceanography. Since then, there have been several major initiatives to increase support for marine biological research at SIO and integrate it into the biological mainstream. This article examines the Scripps Institution as a biological institution and describe manuscript resources at the SIO Archives available to historians of biology.

In 1891 William E. Ritter, a student of Joseph LeConte, returned from graduate studies with E.L. Mark at Harvard to accept the chairmanship of the newly formed Department of Zoology at Berkeley. During the following decade, Ritter visited Liverpool and Berlin, the Stazione Zoologica at Naples, and Alexander Agassiz's Newport laboratory and resolved to establish a seaside laboratory on the west coast. In the style of the times, Ritter began his effort by searching for a millionaire who might fund such a laboratory. He also raised enough money from the University of California to pitch a tent summers beginning in 1892 at various places along the California coast and invited a few colleagues and students to join him in an examination of the local marine fauna.²

Ritter was disappointed more than once in his search for a patron. His efforts to interest the wealthy of San Francisco in the idea were frustrated by the panic of 1893. Ritter was so sure of support from E.H. Harriman, whom he accompanied on the Harriman Alaska Expedition of 1899,

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²Ritter's wife, physician Mary Bennett Ritter described these summer tent seaside laboratories in her autobiography, More than Gold in California, 1849-1933 (Berkeley: Professional Press, 1933) p. 241-242. While most of the participants were student zoologists, the summer seaside laboratory at Avalon in 1893 included Edmund B. Wilson and a young woman named Julia Morgan who was choosing between a career in architecture of zoology.

that he allowed his wife to write her friend Phoebe Hearst about the:

successful outcome of Mr. Ritter's interviews with Mr. Harriman. The latter is genuinely interested in the marine biological work on this coast and promises to help Mr. Ritter's plans to a realization both with his own money and by getting others interested."³

As it turned out, Mr. Harriman was unsuccessful in interesting others and unwilling to underwrite the laboratory alone. Mrs. Hearst escaped the honor of endowing the laboratory, but she donated \$500 on March 13, 1902 to cover a shortfall in the expenses for the summer laboratory at San Pedro in 1901.⁴ Ritter's February 7, 1902 application to the Carnegie Institution of Washington for \$3,000 per year to fund marine biological explorations failed.⁵ A syndicate of Los Angeles area Cal alumni led by attorney Henry O'Melveny failed to raise sufficient funds to endow a permanent laboratory in San Pedro. So after ten years of effort, Ritter was still summering in his tent.

Ritter was understandably cautious during the summer of 1903 when his friend San Diego physician and conchologist Fred Baker invited him to set up the seaside laboratory in San Diego and introduced him to millionaire newspaperman E.W. Scripps. Scripps assured Ritter of his interest in establishing a permanent laboratory in San Diego. "What is to be the outcome of this?" Ritter wrote in his diary on August 2, 1903,

A few years ago before I had had so many elations of this sort, I should have been on the house top with joy and certainty; now however, though I'm sure the goal never was actually so probably within reach, I'm going to stay on the ground. I count no more chickens until they are not only hatched but also fully pinfeathered out.⁶

³Mary Bennett Ritter to Phoebe Hearst, January 13th, n.y. Phoebe Hearst Papers 72/204C, Bancroft Library, University of California, Berkeley, California. This letter must have been written after 1897 in view of the return address.

⁴"Accounts of San Pedro Laboratory University of California, May 15 to August 15, 1901" in Minutes of Meetings of the San Diego Marine Biological Association and the Scripps Institution of Marine Biology, 1912-1918, Accession 81-41, SIO Archives, UCSD.

⁵William E. Ritter to the President and Board of Trustees of the Carnegie Institution, Washington, February 7, 1902. William E. Ritter Papers, MC4, Box 1, f4, "Correspondence, 1902," SIO Archives, UCSD.

⁶William E. Ritter Diary, August 3, 1903. William E. Ritter Papers, Bancroft Library, University of California, Berkeley. SIO Archives holds an additional cubic foot of William E. Ritter Papers as well as Ritter Family papers documenting his youth.

Several historians have written in detail about Ritter's conception for his seaside laboratory.⁷ Ritter's focus before he met E.W. Scripps was clearly on marine biology. In 1903 with financial support from E.W. Scripps and his sister Ellen Browning Scripps, the Marine Biological Association of San Diego was formed with the object of building a marine biological station. The bylaws of the association state that:

the general purposes of the institution shall be to carry on a biological and hydrographic survey of the waters of the Pacific Ocean adjacent to the coast of Southern California; To build and maintain a public aquarium and museum; and to prosecute such other kindred undertakings as the Board of Trustees may from time to time deem it wise to enter upon.⁸

That last phrase was the subject of discussion at the annual meeting of the association on July 20, 1907. Ritter recalled that E.W. Scripps presented a motion that was passed unanimously. In part, the motion read, "It is proposed not to restrict biological research at the station to marine organisms as has thus far been done, but to extend it to land plants and animals as well."⁹

In 1912 the Marine Biological Association of San Diego deeded its assets to The Regents of the University of California, and the institution it had long supported was renamed The Scripps Institution for Biological Research of the University of California.

The most important expression of the enlarged institutional purpose indicated by this name change was the employment of Francis Bertody Sumner, a biologist with an interest in experimental evolution. Sumner carried out his experiment not with marine specimens, but with deer mice. He

⁷Keith Benson has written frequently about Scripps and his student Gail Marie Alexander wrote her 1989 master's thesis on Ritter and his station; Eric L. Mills, "The Scripps Institution: Origin of a Habitat for Ocean Science," La Jolla: SIO/UCSD, 1986 (William E. And Mary B. Ritter Memorial Fellowship Inaugural Lecture); Philip J. Pauly, "Biology and Democracy: The Aims of the Founders of the Scripps Institution," paper delivered at the History of Science Society meeting, La Jolla, 8 November 1997.

⁸By laws of the San Diego Marine Biological Association adopted September 26, 1903. In Minutes of Meetings of the San Diego Marine Biological Association, 1903-1911, Accession 81-40, SIO Archives UCSD.

⁹Ritter described this resolution on page 19 of his unpublished biography of his benefactor. The Philosophy of E.W. Scripps, William E. Ritter Papers MC4, Box 4, folder 11, SIO Archives UCSD, however, the official minutes of the meeting of July 20, 1907 do not mention the resolution. The full wording of the resolution is presented in William E. Ritter, "The Marine Biological Station of San Diego: Its History, Present Conditions, Achievements, and Aims," University of California Publications in Zoology, v. 9 no. 4 (March 9, 1912), p. 245.

began work as a neo-Lamarckian, but his results made a profound contribution to the evolutionary synthesis.¹⁰ Sumner was the first and for some time the only member of the staff of the Scripps Institution elected to membership in the National Academy of Sciences.

A number of biologists were associated with Scripps during the early years. Harry Beal Torrey is listed as a staff member from 1903 to 1912, but he frequently joined Scripps collecting trips well into the 1920's. Charles Atwood Kofoid is listed as Associate Director, 1903-1923. Kofoid was not resident at the institution after 1910 when he succeeded Ritter as chair of zoology at Berkeley. However, he continued to act on behalf of the institution in Berkeley. Scripps had many visiting investigators including Anton Carlson (1903) and C.M. Child (1910).

The broadened biological program was also expressed in the make up of the student body. While the Scripps Institution was better known for research than for teaching during its early years, there were eight students at the institution between 1912 and 1924.¹¹ One of these, Sumner's student Ralph Ruskin Huestis (1892-1969) received a Ph.D. in zoology from the University of California in 1924 and became a geneticist at the University of Oregon.

The early program of the institution included public education through public lectures and displays at the aquarium. However, in 1915 the institution decided to broaden its efforts in this regard. From June to August 1916 Scripps hosted an Assembly in Science which was intended to be a course of study on biology for science teachers in secondary schools. In 1916, the institution issued a new publication, The Bulletin of the Scripps Institution for Biological Research which was meant for a general audience of non scientists. In 1917, staff biologist W.E. Allen wrote popular articles on biology for California newspapers, an effort called the California Biological Feature Service.¹² The only one of these efforts that endured was the aquarium. Few science teachers attended the 1916 assembly which attracted instead an audience of the general public and was never repeated. After 1925, the Bulletin published only technical papers. The California Biological Feature Service received no support from Scripps after 1923, although Allen continued to write a column until his retirement in 1943.

¹⁰William B. Provine, "Francis B. Sumner and the Evolutionary Synthesis," in William Coleman and Camille Limoges, eds. Studies in the History of Biology (Baltimore and London: Johns Hopkins University Press, 1979), pp. 211-240.

¹¹Of the eight student, three eventually earned degrees from the University of California: Henry Homer Collins (Ph.D. Zoology, 1919) became a professor of biology at the University of Pittsburg; Erik Moberg (Ph.D. Biochemistry, 1925) stayed on at SIO as a chemical oceanographer; and Huestis. Nelphi Cummings left Scripps and later earned a Ph.D. in physics at the California Institute of Technology. The four remaining students did not receive UC degrees; one became a mining engineer, one a teacher, and nothing is known of the other two.

¹²Correspondence and manuscripts of these features are found in the Winfred Emory Allen Papers, MC 23, SIO Archives UCSD.

Ritter retired from the Scripps Institution in 1923. When Henry Bryant Bigelow declined the offer of the directorship, a geologist, Thomas Wayland Vaughan, was selected as the new director. At about the same time a decision was made to refocus the research program of the institution on oceanography. On October 14, 1925, the institution was renamed the Scripps Institution of Oceanography. These events had fateful consequences for biological research in La Jolla. When an effort to move Sumner to Berkeley failed, he was instructed to conclude his studies and work on projects more in line with the oceanographic program. Scripps never produced another geneticist, and it has never had another biologist as director.

While general biology was eliminated, Scripps continued its support for marine biology. Sumner, now working on marine specimens, was joined by physiologist Denis Fox in 1931, marine microbiologist Claude ZoBell in 1932 and marine biologist Martin W. Johnson in 1934.¹³ The complexion of the staff changed dramatically in 1944 when Scripps had the extraordinary good fortune to recruit Carl Leavitt Hubbs, just a few months before the death of Francis Bertody Sumner.¹⁴ While Hubbs is remembered principally as an ichthyologist, he was in fact a vertebrate biologist with very broad interests. His early files include material on morphology, ecology, speciation, evolution, geographic variation in fishes and systematics.

Even with a powerful figure like Hubbs on the staff, marine biologists at Scripps felt somewhat second class. When the Scripps directorship became vacant in 1948, Hubbs led an unsuccessful effort to get a biologist appointed director.¹⁵ There was a feeling that marine biology at the Scripps Institution of Oceanography was not as strong as it should be. Director Roger Revelle expressed this view to Warren Weaver at the Rockefeller Foundation and was invited to submit a proposal strengthening marine biology at Scripps. Hubbs expressed his views to Revelle in a memorandum on the Rockefeller grant:

In general the physical sciences have been supported more generously than the biological by contract grants from the Department of Defense. The biological sciences at Scripps have profited to a limited extent directly, and to a larger

¹³ZoBell threw out most of his personal papers upon his retirement, although the SIO Archives has a small collection of files documenting ~~of~~ his participation in the Royal Danish Galathea Expedition of 1950-1952. Martin Johnson kept only a small amount of correspondence which he donated to the SIO Archives. The archives has five boxes of Denis Fox Papers. All three scientists wrote unpublished memoirs which are available to researchers at the SIO Archives.

¹⁴Hubbs had the task of clearing Sumner's office after his death on September 6, 1945. He kept a few files of Sumner's marine research and discarded the correspondence and data. Hubbs donated his own papers, which measure 97 cubic feet, to the SIO Archives when he retired.

¹⁵Carl Leavitt Hubbs Papers, Box 33, folders 44-46, "Scripps Institution of Oceanography, Director, 1947-1964." SIO Archives, UCSD. Hubbs proposed Daniel Merriman for the job.

measure indirectly from such support. A more auspicious balance would result if major support could be obtained for biological work at Scripps.¹⁶

The Rockefeller Foundation proposal was written in consultation with biologists of the Scripps Institution of Oceanography, but the principal author was a visiting geneticist, Adriano Buzzati-Traverso. In fact, the size of the grant, a million dollars, and the project plan was decided in an exchange of letters between Revelle and Weaver before the proposal was even written.¹⁷ The proposal, submitted August 15, 1953, makes an unflattering comparison between the growth in marine biological knowledge and progress in physical oceanography. It notes that, "marine biology as a whole . . . has remained at a descriptive level," and that it needs to be strengthened by new tools and theoretical approaches and by exposure to "the deeper insights into general biological problems obtained by biophysicists, biochemists, geneticists and microbiologists . . ."¹⁸ It goes on to request funds to support faculty positions and postdoctoral fellowships.

While Hubbs did not write the proposal, he played a key position in the committee formed to recruit new faculty. The Rockefeller Faculty Committee decided that Scripps needed an experimental marine biologist, an invertebrate zoologist, a microbial biochemist and a plant physiologist. It was this committee that recommended the recruitment of physiologist Per Fredrik Scholander.¹⁹ Scholander initially worked on problems of plant physiology at Scripps, but he is best remembered for designing a floating laboratory ship, R/V ALPHA HELIX and addressing physiological research problems in the field in a series of expeditions undertaken with National Science Foundation support between 1966 and 1980.²⁰

¹⁶Memo from Carl Hubbs to Roger Revelle, July 21, 1953, Carl Leavitt Hubbs Papers, Box 31, folder 50, "Rockefeller Grant," SIO Archives UCSD.

¹⁷See for instance Revelle to Weaver 14 November 1952 in SIO Subject Files (AC6), Box 11, folder 47, "Marine Biology Program and Rockefeller Grant, 1952-1958." SIO Archives UCSD.

¹⁸"Proposed Development of Marine Biology at the Scripps Institution of Oceanography," 15 August 1953, a proposal submitted to the Rockefeller Foundation, SIO Subject Files, AC6, Box 11, folder 47, "Marine Biology Program and Rockefeller Grant, 1952-1953," SIO Archives UCSD.

¹⁹Carl Leavitt Hubbs Papers, Box 31, folder 48, "Rockefeller Faculty Committee, Physiology, 1955-1957," SIO Archives UCSD.

²⁰The Records of the S.I.O. Alpha Helix Program Management Office are at the SIO Archives and include fifteen linear feet of subject files and expedition files. These have been described in a guide: Carolyn Rainey, A Guide to the Records of the S.I.O. Alpha Helix Program Management Office (1966-1980) Archival Collection AC7. SIO Archives also holds original films made on Alpha Helix expeditions and the Records of Per F. Scholander as Director of the S.I.O.

Roger Revelle defined oceanography as whatever sciences were done at the Scripps Institution of Oceanography. By the 1960's oceanography included physiology, genetics, and neuroscience. Historians of biology and scholars interested in exploring historical connections and contrasts between physical and life sciences will find collections in the archives of the institution useful to their studies. The SIO Archives has a web page: scilib.ucsd.edu/sio/archives that includes a bibliography on the history of the institution, guides to a growing number of its collections, an E-mail link to the archivist and a sample of its photograph collections. The SIO Archives is on the campus of the Scripps Institution of Oceanography, located on the beach a mile from the main University of California, San Diego campus in La Jolla, California. Researchers should call in advance of their visit. The phone number is (619) 534-4878.

Physiological Research Laboratory. These records include a small quantity of Scholander personal papers.