

HOPKINS SEASIDE LABORATORY  
OF NATURAL HISTORY

STANFORD UNIVERSITY

1892-1917



Summer class of 1892 standing in front of the Hopkins Seaside Laboratory, Stanford University, Pacific Grove, California. Photograph Courtesy of Stanford University

Archives.

HOPKINS SEASIDE LABORATORY OF NATURAL HISTORY

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HOPKINS SEASIDE LABORATORY OF NATURAL HISTORY

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**PROLOGUE**

*STUDENTS AT PACIFIC GROVE*

*Summer School of Natural History Opens at the Hopkins Seaside Laboratory.*

*PACIFIC GROVE, Cal., June 8. [1897] — The sixth annual session of the Summer School of Natural History opened yesterday at the Hopkins Seaside Laboratory at this place. The large number of students enrolled upon the first day and the unusual rapidity with which real work was begun greatly pleased the instructors as saving promise of an exceptionally successful term. The morning was spent in registration of the pupils, arranging the classes and planning the lines of work to be followed.*

*This year George C. Price, assistant professor of zoology at Stanford University, will take charge of the course in zoology. This will consist of the study of the structure, physiology and life histories of typical animal forms, more particularly marine animals. Walter R. Shaw, instructor of botany at Stanford, will give a course of lectures and assist in the investigation by the students along the line of study of the principal groups of (comparatively) freshwater and marine plant life, and a very little side work in land plant life. These two courses are known as the teachers' courses and are of great value to those who teach zoology and botany in the high schools or other departments of school work.*

*The advanced course in morphology, physiology and embryology will be conducted by Harold Heath, fellow in zoology in the University of Pennsylvania, and professor Frank McFarland of Stanford, who is associate instructor here, will conduct the class in histology.*

*In the afternoon yesterday some collection of specimens from the adjacent rocks and water was done, and the students busied themselves preparing the specimens for study.*

*The collecting grounds hereabouts are said by scientists to be among the richest in the world, and for this reason investigators from many of the prominent universities of America and Europe come during the year and avail themselves of the excellent facilities for work afforded by this well-equipped laboratory.*

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*While really a separate institution the Hopkins laboratory is practically a part of Stanford University, and is attended by the students of that institution chiefly. Many gaps which are left by even the most thorough work at the university laboratory from specimens in alcohol may be successfully filled by the students of marine, plant and animal life, who can get his subjects fresh from the waters of Monterey Bay. For this reason Timothy Hopkins' generous gift is considered one of the most valuable adjuncts of Stanford's great institution.*

*About twenty-eight students were registered on the opening day and application, from many more have been received. The board of directors expect a total enrollment of about forty-five this year.<sup>1</sup>*

The above newspaper article, appearing in the San Francisco Call in June 1897, reports the educational happenings to be taking place during the “*Summer School of Natural History*” at the “*Hopkins Seaside Laboratory*” in “*Pacific Grove, Ca.*” Among the items mentioned in this article are 1) the instructors in charge of courses, 2) the fact that the seaside laboratory is nominally associated with Stanford University, 3) and the appreciative recognition of the financial support provided by a Mr. Timothy Hopkins.

If one visits what is today, Stanford University’s Hopkins Marine Station in Pacific Grove, one may happen upon a few of the remnants that refer back to the origins of this biological teaching and research facility. For example, a stroll through the grounds may lead one to a two story building whose cement façade, built of reinforced concrete, has chiseled in big bold letters above the entrance, the words, “HOPKINS MARINE STATION - JACQUES LOEB LABORATORY.” Entering through the doorway of this building, on the wall directly to ones' left, hangs a portrait of former Stanford trustee, Timothy Hopkins. This portrait, one of two commissioned by Mrs. Timothy Hopkins, was painted by William V. Schevill, and placed at the Hopkins Marine Station; the other painted by Kenneth Frazier, was placed in the Hopkins Room in the University Library in Palo Alto.<sup>2</sup> After viewing the portrait, if one turns immediately to the right, one notices two large photographs positioned on the wall. One of these photographs presents the faculty, students, and staff who spent the summer of 1894 at the Hopkins Seaside

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Laboratory, while the other photograph presents the faculty, students and staff who spent the summer of 1993 at Hopkins Marine Station. Many visitors who view the Hopkins Seaside Laboratory photograph of 1894 comment on the number of female students, practically half the cohort, who are standing amongst their male colleagues. With that comment, the visitors then recognize an almost equal proportion of men and women presented in the 1993 photograph.

Exiting the Loeb building, one may stroll a short distance across the grounds to a three story building, also built of reinforced concrete, whose facade has in big bold letters, running the across the top, the words “HOPKINS MARINE STATION OF STANFORD UNIVERSITY.” If one looks closely at the front face of this building, positioned just above the main entrance, one notices the word “AGASSIZ,” again, in big bold letters. Those visitors who are struck with a sense of inquiry, sometimes ask, who or what is Agassiz?

Strolling through the entrance of this building, directly to one’s right is a display of old scientific instruments, including a brass microscope, several examples of fancy laboratory glassware, and several old specimen bottles containing marine organisms of one kind or another. Just a few steps further, positioned along the wall, as one ascends the wooden stairs toward the third floor, are several more old historic photographs. One of these photographs presents a mingled conglomeration of wooden shacks, these being several of the residences of a Chinese fishing village that was once located on the property long ago. Another photograph presents the Hopkins Seaside Laboratory of Natural History, which consisted of two buildings perched on a seaside bluff.

The following pages present the history of the Hopkins Seaside Laboratory; the original facility that pioneered the formation, for what is today, the Hopkins Marine Station of Stanford University in Pacific Grove, California. Before presenting the history of the Hopkins Seaside Laboratory, it is important to tell the story of America’s first seaside laboratory, established on an uninhabited and remote island, twenty-five miles off the coast of Massachusetts, named Penikese.

Founded under the premise of an educational experiment, this first seaside laboratory introduced America to summer schools of science. The person responsible for

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organizing this first summer school of science was a Harvard professor named Louis Agassiz. We begin with an introduction to Agassiz, for it will be his mentoring efforts on a select group of students who attended America's first summer school of science, that would migrate across the continent to the farthest reaches of the western United States, and inspire the establishing of the Hopkins Seaside Laboratory of Natural History in Pacific Grove, California.



Summer Session 1894. Hopkins Seaside Laboratory, Stanford University, Pacific Grove, California. Photograph Courtesy of Stanford University Archives.

CHAPTER 1

**JEAN LOUIS RODOLPHE AGASSIZ, M.D., Ph. D., LL.D.**

Louis Agassiz was born on May 28, 1807, in a village named Môtier in the Canton of Fribourg, Switzerland. His father was a Protestant pastor, as were five generations of his ancestors. After being home schooled until age eleven, Agassiz was sent to Gymnasium of Bienne, where he spent four years studying ancient and modern languages. It was during this period that Agassiz's interest in natural history arose: during school vacations, he organized collections of objects of nature.<sup>3</sup> His father wanted him to join the clergy, but his interest in natural history could not be resisted, so he pursued the study of medicine, in line with his interests in nature.<sup>4</sup>

In 1824, Agassiz entered the University of Zurich, where he pursued zoological investigations under the Swiss physician and naturalist Professor Heinrich Rudolf Schinz. Agassiz next studied at the University of Heidelberg, under Friedrich Tiedemann, Professor of Anatomy and Physiology. In 1827, Agassiz transferred again, attracted by the remarkable group of naturalists at the University of Munich. There, Agassiz was selected by Carl Friedrich Philipp von Martius to work on the natural history of the freshwater fishes of Brazil, the material for which had been collected by a scientific expedition, sent out by the governments of Austria and Bavaria. Agassiz's study of Brazilian fishes was published in 1829 in a folio volume, "*Pisces etc., quos collegit et pingendos curavit Spix, descripsit Agassiz*" and included 91 lithographic plates. It was in this work that Agassiz began to establish his reputation as a naturalist.<sup>5</sup>

By now, Agassiz's parents had become quite disappointed with their son's increasing interest in natural history, which had almost completely displaced his study of medicine, and they suspended his financial support.<sup>6</sup> To regain his parents' approval, Agassiz returned to his medical studies, receiving a doctorate in medicine from the University of Munich in 1830. From Munich, Agassiz traveled to Paris, where he spent a short time studying under the direction of Georges Cuvier, a major figure in natural sciences in the early 19th century.<sup>7</sup> Agassiz remained in Paris, until Cuvier's death in

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1832, where upon he returned to Switzerland, accepting the position of Professor of Natural History in the recently established College of Neuchâtel.

By the age of thirty-three, Agassiz belonged to every scientific academy in Europe and had received invitations from several leading universities to join their faculties.<sup>8</sup> Agassiz chose to remain at College of Neuchâtel and continue his studies of natural history. His next publication was titled *Natural History of the Freshwater Fishes of Central Europe*, in two parts (1831, 1842). The progress of this work was interrupted by *Researches on Fossil Fishes*, published in parts from 1832 to 1842, with 311 lithographic plates. For this publication, he examined many important museum collections, particularly those of the Museum of Natural History in Paris.<sup>9</sup>

From 1836 to 1845, Agassiz spent his summers in the Alps, developing his theory on the formation of glaciers, often in the company of his friend and fellow Swiss geologist Arnold Henry Guyot. In 1840, Agassiz published *Etudes sur les Glaciers* (“Studies on Glaciers”), a volume that revolutionized existing theories on the development and movement of glaciers. This publication was followed by a more detailed exposition and presented further evidence for this theory *Systeme Glaciare*, (“Glacier System”) published in 1847.<sup>10</sup> With these works, Agassiz established himself as the author of a massive treatise on fossil fishes and a major proponent of the ice-age theory. By the time he arrived in America, he was uniquely positioned to become a leader in American science.<sup>11</sup>

Louis Agassiz’s influence on the United States began in the fall of 1846, when at the age of thirty-nine, he crossed the Atlantic Ocean.<sup>12</sup> Fresh from Switzerland, he found himself welcomed in America like the prophet of a new religion.<sup>13</sup> From the moment of his arrival, he began the mission of advancing both science and the teaching of science in the United States. Textile magnate and Harvard University supporter John Amory Lowell had invited Agassiz to present twelve lectures on the three subjects, “*The Plan of Creation as shown in the Animal Kingdom, Ichthyology, and Comparative Embryology*” at the Lowell Institute of Boston, Massachusetts.<sup>14</sup> A brilliant lecturer and scholar, this invitation served as Agassiz’s original motivation for traveling to America. During that first winter, Bostonians flocked into Lowell Institute’s Tremont Temple to hear Agassiz speak; on some evenings as many as five thousand packed the temple.<sup>15</sup> So great was public interest

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to hear these talks of science that Agassiz found it necessary to offer his lectures each day to a second audience.<sup>16</sup> It would be these lectures for the Lowell Institute that would start Agassiz's communication of science to the American public for the next 27 years of his life. With every series of lectures that Agassiz presented, his popularity amongst the American public grew ever larger.

During October and November of 1847, at the request of the Faculty of the College of Physicians and Surgeons of New York, Agassiz delivered in the hall of that institution a series of twelve lectures on the principles of classification in the animal kingdom. The complete transcript of each lecture was printed the following day in the *New York Tribune*, the first time Agassiz's lectures had been transcribed and printed in full, just after an evening's presentation. Newsboys in the streets of New York could be heard yelling at the top of their voices, "Professor Agassiz's Lecture!"<sup>17</sup> The American public was enthralled. The demand for the papers containing these admirable discourses was so great that the editor of the *New York Tribune* was obliged to issue them in the form of a pamphlet, *An Introduction to the Study of Natural History*.<sup>18</sup>

Several months after this lecture series, in January 1847, Agassiz was approached by several friends, among them John A. Lowell, to ask if he would consider accepting a permanent position as Professor of Zoology and Geology at Harvard College in Cambridge, Massachusetts.<sup>19</sup> That very year, Louis Agassiz would be officially appointed to position of Professor of Zoology and Geology to be held in the new Lawrence Scientific School at Harvard University. Agassiz would spend the rest of his life at Harvard, training America's first cohort of academic instructors of natural history and many of this nation's first and most prominent naturalists.

**LOUIS AGASSIZ AS MENTOR**

During his career at Harvard (1848-1873), Louis Agassiz served as the direct mentor to a number of students, many of whom went on to become some of America's most famous scientists. According to David Starr Jordan, the first president of Leland Stanford University, nearly all of the early teachers of biology in America—men born between 1825–1850, most of them prominent in their field of study—were, at one time or another, students of Louis Agassiz.<sup>20</sup> The names of the scientists mentioned by David Starr Jordan form an impressive roster:

Alexander Agassiz, Director of Harvard's Museum of Comparative Zoology;

Joel Asaph Allen, Curator of the American Museum of Natural History;

John Gould Anthony, Director of the conchology department of Harvard's Museum of Comparative Zoology;

Albert Smith Bickmore, American naturalist and one of the founders of the American Museum of Natural History;

Jesse Walter Fewkes, Director of the Smithsonian's Bureau of American Ethnology;

Samuel Garman, Assistant Director of herpetology and ichthyology at Harvard's Museum of Comparative Zoology;

Charles Frédéric Girard, Smithsonian Institution, specialist in ichthyology and herpetology;

Charles Frederic Hartt, Professor at Cornell University;

Alpheus Hyatt, Professor of Biology and Zoology at Boston University;

Joseph LeConte, Professor at the University of California;

Theodore Lyman, member of the American Academy of Arts and Sciences and of the National Academy of Sciences, a trustee of the Peabody Education Fund, and an overseer of Harvard University;

Charles S. Minot, Professor at Harvard Medical School;

Edward Sylvester Morse, Professor at Imperial University of Tokyo;

Alpheus Spring Packard Jr., Professor at Brown University;

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Frederic Ward Putnam, Director of the Peabody Museum of Archeology and Ethnology of Yale University;

Samuel H. Scudder, distinguished entomologist;

Nathaniel Shaler, Dean of Harvard Graduate School;

Philip Reese Uhler, Professor of Natural Sciences at Johns Hopkins University;

Charles Otis Whitman, founder of the Marine Biological Laboratory at Woods Hole;

Burt Green Wilder, Professor at Cornell University.

In addition to those he mentored, Agassiz's closest friends and associates included many of America's leading early naturalists:

Spencer F. Baird, Secretary of the Smithsonian Institution, Commissioner of Fish and Fisheries for the United States Fish Commission;

James D. Dana, Professor of Natural History and Geology at Yale College;

Asa Gray, Professor of Natural History at Harvard University, considered the most important American botanist of the 19th century;

Hermann August Hagen, Professor of Entomology, Harvard University;

Jared Potter Kirtland, naturalist, malacologist, and physician, co-founder of Western Reserve University's Medical School and what would become the Cleveland Museum of Natural History;

John P. Lesley, Professor of Geology at the University of Pennsylvania;

Charles Léo Lesquereux, Swiss bryologist and a pioneer of American paleobotany;

William Stimpson, Director of the Department of Invertebrates, Smithsonian Institution, Director of the Academy of Science in Chicago.<sup>21</sup>

Not only did Agassiz serve as mentor for the first generation of America's prominent scientists, but he also provided the inspiration and organizing force behind what would become one of the greatest museums of natural history in the world, the Harvard University Museum of Comparative Zoology.<sup>22</sup>

**THE MUSEUM OF COMPARATIVE ZOOLOGY**

When Louis Agassiz began his professorship at Harvard, there existed not a single collection of tangible objects of nature at the school with which to illustrate his lectures on geology and zoology.<sup>23</sup> As a start toward organizing a collection of such specimens, the University provided, as storage for the objects Agassiz had begun to gather, a small old wooden shack that rested on four pilings along the Charles River. The shack itself contained little more than a few pine shelves, along with several wooden tables that provided space for dissecting specimens. It was within this small wooden shack that Agassiz began to organize his collection.<sup>24</sup>

Within a short time, Agassiz's collection of objects of nature would outgrow this small wooden shack.<sup>25</sup> In 1850, to further support his efforts, the University appropriated a small amount of funding each year toward the care of the collection and provided Agassiz with a larger storage space in the basement of an old building on the Harvard campus.<sup>26</sup> The next several years found Agassiz's collection of natural objects burgeoning, with storage split between the wooden shack along the Charles River, the basement of Harvard Hall, and his own residence. In 1852, Samuel Eliot, then Treasurer of Harvard University, raised by private donation, the amount of twelve thousand dollars to purchase and pay for the arrangement of Agassiz's collection.<sup>27</sup>

Finally, in 1858, a Mr. Francis C. Gray of Boston provided in his estate, upon his death, fifty thousand dollars to Harvard to establish a museum to house the specimens of nature under the direction of Louis Agassiz with the condition that this institution should always be referred to as The Museum of Comparative Zoology.<sup>28</sup> In that same year, through Agassiz's influence and encouragement, the Massachusetts legislature provided a grant of one hundred thousand dollars, with more than seventy thousand dollars pledged by the citizens of Boston "*for the purpose of erecting a fire-proof building in Cambridge suitable to receive, to protect, and to exhibit advantageously and freely to all comers, the collection of objects in natural science brought together by Professor Louis Agassiz, with such additions as may hereafter be made thereto.*"<sup>29</sup>

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And so, it was that by the year 1859, the very year in which Charles Darwin's *Origin of Species* appeared, Louis Agassiz successfully organized the Museum of Comparative Zoology at Harvard College.

In the following excerpt from an address given, in San Francisco, on September 2, 1872, to the California Academy of Sciences, Agassiz discusses establishing the museum, and collection's usefulness to his method of instruction of natural history.

*I went single-handed to Cambridge, to teach natural history, twenty-five years ago. When I delivered my first lecture, there was not in the University a single specimen to illustrate what I had to say. And yet, a little band of students, feeling an interest in what they could learn in the lecture room, and others, thought such a pursuit was worth encouraging, and by and by the idea arose that a museum would be of use, and the means were gradually forthcoming, at first in small contributions, but gradually more liberally in larger sums, until at this moment, after fourteen years only, the museum at Cambridge stands in my estimation, without parallel in the world. .... This is what the world wants-not books read, but men to learn what is not yet known. Those men cannot be educated in the schoolroom. They must be educated in Nature, among specimens, by the teachings of that thing that has not been explored now.<sup>30</sup>*

Many of the early assistants who were trained by Louis Agassiz at the Museum of Comparative Zoology later featured prominently in the history of natural science in America; became professors at Harvard or other universities; or headed major natural history museums, which were rapidly being established throughout the United States.<sup>31</sup> Among them were Albert Smith Bickmore, who is credited for the design and creation of the American Museum of Natural History in New York City<sup>32</sup>, and Frederic Ward Putnam, who was among the founders of the Museum of the Peabody Academy of Science in Salem, Massachusetts and served there for many years as director.<sup>33</sup> Even with the completion of the Museum of Comparative Zoology, Agassiz continued his drive to popularize nature study, extend the teaching of natural history beyond the walls of the museum into school curricula, and advance the scientific literacy of the American people.

**LOUIS AGASSIZ'S ASPIRATIONS**

Louis Agassiz was a man who had many aspirations during his lifetime. One of his aspirations was nothing less than the complete transformation of how American society as a whole related to, taught about, and studied nature. To this end, Agassiz aimed to introduce his method of nature study into the curricula of the American school system. From the time of his arrival in this country, Agassiz had worked to establish a strong connection with the teachers of the State of Massachusetts; attending and lecturing to the Teachers' Institutes, visiting the teacher training schools, then referred to as “normal schools,” and associating himself actively, as much as he possibly could, with the interests of public education.<sup>34</sup> As a charismatic, well-respected Harvard professor, he was frequently invited to speak to the general public. Agassiz took advantage of such opportunities to popularize the study of nature in America. In addition to giving countless public presentations, he opened his lectures at the Harvard Museum of Comparative Zoology to schoolteachers, encouraging women as well as men to attend.<sup>35</sup>

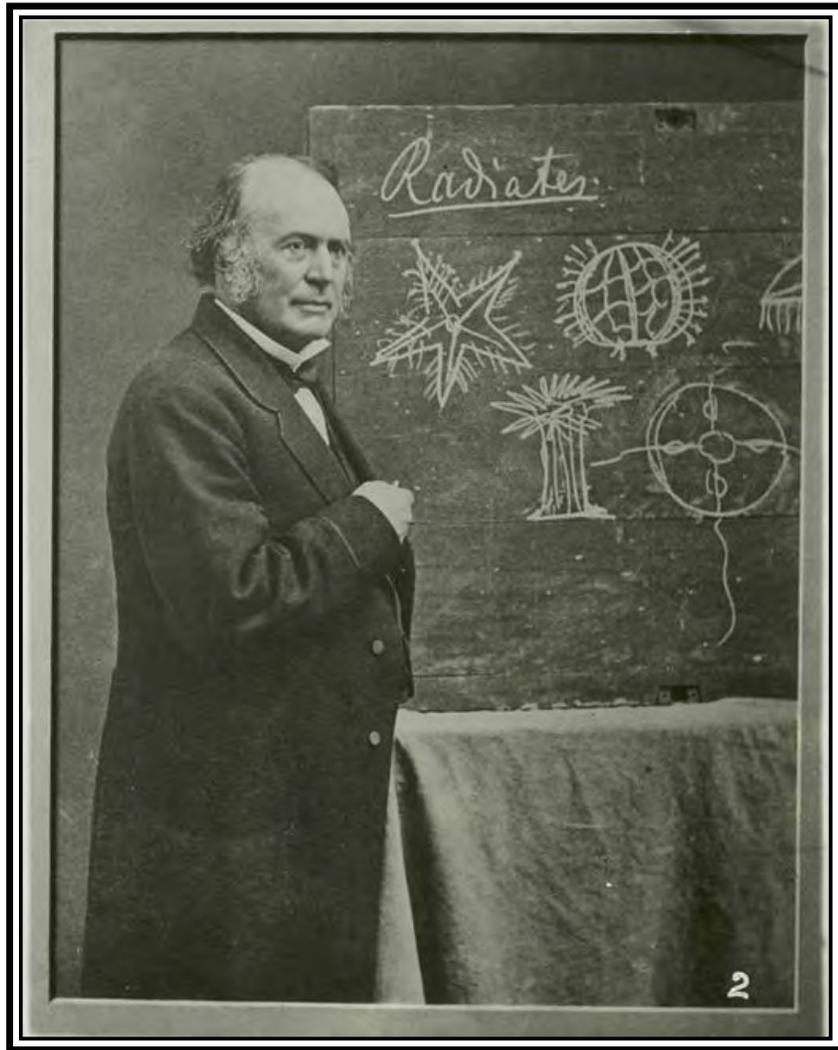
As poignantly described by Sally Gregory Kohlstedt, *Louis Agassiz lectured to anyone who would listen—from the educated elite at the Lowell Institute, to the young women attending his wife Elizabeth Agassiz’s girls’ school in Cambridge, and to audiences in major cities interested with idea of building public natural history museums. His vision for engaging learners in studying the natural world influenced both his formal and informal students, many of whom in the years to come, would work to introduce Agassiz’s method of instruction of natural history to the public schools through the training of schoolteachers.*<sup>36</sup>

In the article titled *Agassiz at Penikese (The Popular Science Monthly, April, 1892)*, David Starr Jordan aptly describes the educational effort that was taken up next by Louis Agassiz, as yet another attempt to introduce nature study into the curriculum of American schools.

*Notwithstanding the great usefulness of the museum and the broad influence of its teachers, Agassiz was not fully satisfied. The audience he reached was still too small. Throughout the country the great body of teachers of science went on in the old*

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*mechanical way. On these he was able to exert no influence. The boys and girls still kept up the humdrum recitations from worthless text-books. They got their lessons from the book, recited them from memory, and no more came into contact with Nature than they would if no animals or plants or rocks existed on this side of the planet Jupiter. It was to remedy this state of things that Agassiz conceived, in 1872, the idea of a scientific "camp-meeting," where the workers and the teachers might meet together — a summer school of observation where the teachers should be trained to see Nature for themselves and teach others how to see it.*<sup>37</sup>



Louis Agassiz at the chalkboard.

Courtesy of the Marine Biological Laboratory Archives

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### THE ANDERSON SCHOOL OF NATURAL HISTORY

During the last summer of his life, in 1873, Louis Agassiz would conduct one final experiment in education and obtain the extraordinary results he had long sought. In this final effort toward transforming the scientific education of the American people in nature study, Agassiz set about establishing America's first seaside laboratory, the Anderson School of Natural History, to serve America's first summer school of science. The spark for this summer school of science was credited to Nathaniel S. Shale, who initially suggested the possibility to his college professor, Louis Agassiz. The idea was to establish a seaside laboratory at Nantucket, to operate during the summer, for both university students and science teachers in secondary schools.<sup>38</sup>

What Agassiz did not know at the time, and would not live long enough to see, was that the result of this final experiment would fulfill his grand aspiration, as the popularization of the study of nature was to be embraced by the American educational system and American society at large. To grasp the influence of Agassiz's experiment on this nation's education system, one must appreciate that at this time in U.S. history, university education was centered on the classics. An education in natural sciences offered little career opportunity and, therefore, was largely avoided.<sup>39</sup> This strong emphasis on the classics resulted in few standard academic institutions, be it a seminary, normal school, college, or university, capable of training schoolteachers as instructors in biological sciences or natural history.<sup>40</sup> Agassiz's final experiment in education, the Anderson Seaside Laboratory of Natural History, was his attempt to remedy this problem. His purpose was not to advance professional scientific investigation. The goal of the summer school of science was to train teachers in what he considered the best method for learning and teaching about the natural world.<sup>41</sup>

On December 14, 1872, twelve months to the day before his death, Agassiz issued a circular announcing his summer school of science: *Programme of a Course of Instruction in Natural History, to be delivered by the Seaside, in Nantucket, during the Summer Months, chiefly designed for Teachers who propose to introduce the Study into their Schools and for Students preparing to become Teachers. I must make hard work a*

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*condition of a continued connection with the school, and desire particularly to impress it upon the applicants for admission that Penikese Island is not to be regarded as a place of summer resort for relaxation. I do not propose to give much instruction in matters which may be learned from books. I want, on the contrary, to prepare those who shall attend to observe for themselves. I would therefore advise all those who wish only to be taught natural history in the way in which it is generally taught, by recitations, to give up their intention of joining the school.*<sup>42</sup>

Agassiz emphatically explains in the circular that his primary intent in this summer school was for the teachers to focus on a method of nature study through observation. As a location for the experimental school, Agassiz had persuaded John Anderson, a wealthy New York tobacco merchant who owned a small isolated island named Penikese, to allow him to use the land as a site. In addition to the use of the island, Anderson agreed to a \$50,000 endowment for the school. Additional donations included a yacht with 80-ton cargo capacity for collecting purposes. A building was quickly constructed complete with fifty-eight rooms for lodging on the second floor.<sup>43</sup> The next step, in the spring of 1873, was for Agassiz to personally select, from over one hundred applicants, forty-four students to attend this experimental school. These chosen students, 28 men and 16 women, were primarily instructors from seminaries, normal schools, and small colleges who themselves, at their own institutions, were educating young people to become schoolteachers.<sup>44</sup> Thus, Agassiz seized an opportunity to select those students whom he could teach and send forth, as apostles on a mission, to carry into their own institutions his view of the proper method of studying nature. Key to this method of study were [1] developing skills of observation through using objects of nature and [2] encouraging critical, creative and independent thinking.

On July 8, 1873, the Anderson School of Natural History opened on uninhabited Penikese Island, the most remote of the Elizabeth Islands off the coast of Massachusetts in Buzzard's Bay, 25 miles southeast of Newport, Rhode Island. In the early morning of this first day, a little ferry steamer set out from New Bedford, Massachusetts carrying those forty-four chosen students and eight accompanying instructors bound for Penikese Island. That morning, Agassiz intercepted the group at the dock upon arrival, providing an

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impromptu lengthy lecture emphasizing the summer's theme: students attending the Anderson School would "study nature, not books."<sup>45</sup>

The summer experience at the Anderson School of Natural History presented Agassiz's chosen group of American educators with their first opportunity to study nature in nature.<sup>46</sup> The program of instruction for the six-week program began each morning with a set of informal talks, followed by an hour or more of dissection and working with microscopes. During the afternoons on Penikese, the students were free to explore the island and collect materials for scientific investigation. The evenings on Penikese were spent writing up notes from the day's work, dissecting by candlelight, or attending lectures.<sup>47</sup> As described by Jules Marcou in the book *Life, Letters, and Works of Louis Agassiz* (1896) *Every one was collecting, examining with microscopes, dissecting, or watching marine animals in aquaria improvised out of pails and buckets. Agassiz lectured nearly every day, and frequently twice a day; and his passion for teaching had full play.*<sup>48</sup>

Thus it was here, on this isolated island named Penikese, that Louis Agassiz inspired forty-four students to return to their institutions and introduce his method of nature study. A number of these students would come to be leaders in what eventually became this nation's "Nature Study Movement."<sup>49</sup> This American-born nature study movement would inspire an untold number of teachers on every level of education throughout the United States to introduce the science of natural history into their curricula.

Sadly, Agassiz would not live to see the results of his educational experiment spread far from the shores of Penikese Island. That winter, on December 14, 1873, Louis Agassiz died unexpectedly at the age of sixty-six. Alexander Agassiz, Louis Agassiz's son and himself an expert zoologist, continued the Anderson School of Natural History during a second successful summer session. Regrettably, Alexander's idea of relocating the laboratory to the more convenient locality of Woods Hole was let drop; the colleges appealed to for support showed little interest, and America's first seaside laboratory closed permanently at the end of only its second season.<sup>50</sup> As a result, the buildings and facilities of the Anderson School on Penikese were abandoned and allowed to rot slowly away.<sup>51</sup>

Like prophets of a new-found religion who go forth with missionary zeal, six of the students in the Penikese class of 1873, would go forth and establish their own seaside

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laboratories. Agassiz's educational experiment on Penikese Island (1873-1874) was followed by Alpheus Packard's Summer School of Biology at the Peabody Academy of Science (1876-1881) in Salem, Massachusetts. Next, William Keith Brooks established the Chesapeake Zoological Laboratory of Johns Hopkins University (1878-1906). The third seaside laboratory was the Annisquam Seaside Laboratory on Cape Ann, Massachusetts, under the auspices of the Boston Society of Natural History (1881-1886); Alpheus Hyatt was its founder and director.<sup>52</sup>

Though these first three seaside laboratories were short-lived, the next three remain active today. In 1888, under the leadership of Charles Otis Whitman, the Woods Hole Marine Biological Laboratory in Woods Hole, Massachusetts was established. Next, in 1890, Franklin William Hooper, then director of the Brooklyn Institute of Arts and Sciences, established the Brooklyn Institute Biological Laboratory in Cold Springs Harbor, Massachusetts, now simply known as Cold Springs Harbor Laboratory. Finally, in 1892, David Starr Jordan, then President of Stanford University, established Hopkins Seaside Laboratory of Natural History in Pacific Grove, California.<sup>53</sup>

These six early seaside laboratories were originally established with the intent to attract, in addition to university students and scientific researchers, an audience of elementary and secondary schoolteachers, as well as instructors positioned at seminaries, normal schools, and small colleges, responsible for the training of schoolteachers.<sup>54</sup> As such, these early seaside laboratories served to extend Agassiz's experiment in education, embracing his belief that the most effective way to teach natural history was to bring a selected group of students face-to-face with nature, under the expert guidance of gifted instructors.<sup>55</sup>

Louis Agassiz's aspiration of introducing nature study into the American educational system - and the society at large - would first find its way to the shoreline community of Pacific Grove California in 1880, as part of a two-week program of a Chautauqua Assembly. In the summer of 1892, thirteen years after the arrival of the Pacific Coast Assembly of CLSC, Stanford University's Hopkins Seaside Laboratory of Natural History, opened its doors. This would be, in large part, the result of the fact that, there standing on the dock, amongst the forty-four students chosen to attend Penikese in

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July 1873, was a young David Starr Jordan, who would, some eighteen years later in March of 1891, be appointed the first President of Leland Stanford Junior University.