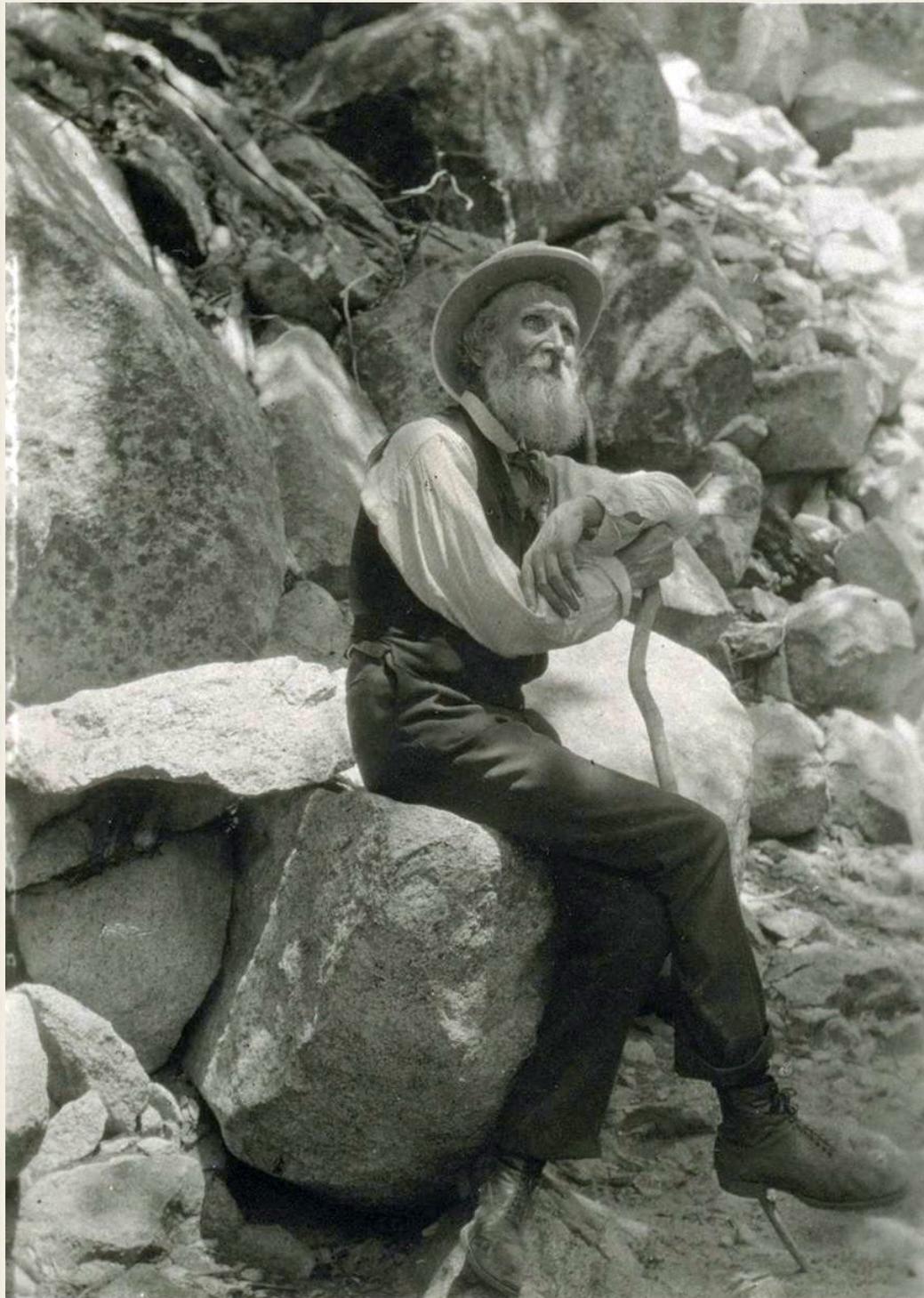


CHAUTAUQUA:

THE NATURE STUDY MOVEMENT IN PACIFIC GROVE, CALIFORNIA



I revere his memory with that of my father and the New England Puritans, - types of the best American pioneers whose unwavering faith in God's eternal righteousness forms the basis of our country's greatness. - John Muir

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PROLOGUE

ANY PERSON CAUGHT MOLESTING BUTTERFLIES WILL BE PROSECUTED TO THE FULL EXTENT OF THE LAW

PACIFIC GROVE POLICE DEPARTMENT

We begin with a true story: the origin of legal protection for the monarch butterflies that migrate annually to the small coastal town of Pacific Grove, California. As far back as anyone can remember monarch butterflies have arrived in Pacific Grove late in the fall where they overwinter in a particular grove of trees. By the thousands, these butterflies gather in great clusters on the trees, remain all winter long, and depart in early spring. The clusters of monarchs would often draw the curiosity of mischievous small boys who, from time to time, tossed sticks or stones at the fragile butterflies, or worse yet, crudely dissected the monarchs by tearing them into small pieces. Witnessing such destructive acts, one local individual by the name of Paul Brace Norton recognized the butterflies' need for protection --- and provided it.

PB Norton's father, Henry Brace Norton had been vice principal and instructor of natural history at the Kansas State Normal School in Emporia, Kansas. In 1875, HB Norton accepted the position of vice principal and instructor of natural history at the California State Normal School at San Jose, and the Norton family moved to California. Together, HB Norton and his wife, Marian Goodrich Norton, had five children, the last two of them born in California. PB Norton was their fifth child, born on the centennial of the United States, July 4, 1876, in the small town of Sequel, in Santa Cruz County. It was this fifth son of HB and Mar-

ian Norton who would take the lead in establishing an ordinance to protect the butterflies in Pacific Grove.

PB Norton first attended the California State Normal School at San Jose and later the Oakland Technical School of Engineering. For over 20 years, Norton worked for Southern Pacific Railroad as a traffic agent, then founded a wholesale florist business in San Francisco, a venture that netted him a tidy fortune. After two years, he sold the florist business and moved to Pacific Grove, his permanent residence. There, Norton became the manager of the shipping and receiving department of the Holman's Department Store, where he would be employed for over 15 years. In addition to working at the department store, Norton served two terms on the City Council of Pacific Grove and was director of the city's Chamber of Commerce.

It was during his time on the City Council that Norton authored one of Pacific Grove's most famous ordinances, making it a misdemeanor to disturb the monarch butterflies. In the year 1939, City Councilman Paul Brace Norton "instigated a city ordinance making it a crime, punishable by six months in jail or a \$500 fine, or both, to disturb the butterflies" of Pacific Grove (Pacific Grove Butterflies Leave For Distant Parts, San Jose News, March 16, 1939).¹ Norton argued before the Council, "Driven from pillar to post, the defenseless butterflies are fast approaching extinction at the hands of brutal and heartless people" (Pacific Grove Butterflies Leave For Distant Parts, San Jose News, March 16, 1939).² His proposal gained overwhelming approval; the resulting ordinance provided protection for the monarchs and eventually led to the designation of a select grove of trees to serve as a butterfly sanctuary.

We begin with this history of how an ordinance protecting butterflies came to be, as it touches on four of the subjects of prominence in the pages to come. The first of these subjects of prominence being what were once commonly referred to as "Objects of Nature." As we will come to understand, a monarch butterfly is but one example of an object of nature commonly found among the col-

lections gathered together, displayed within natural history museums, and utilized by instructors of natural history for the proper method of study of nature. The second of these subjects of prominence being a pioneering family by the name of “Norton,” specifically HB Norton and his older sister, Mary EB Norton. The third of these subjects of prominence being a small coastal Methodist camp named the Pacific Grove Retreat, an outpost for the ideals of New England Puritans, positioned two mile west of Monterey, California. The fourth subject of prominence being the source of Anglo Californian’s reverence for the natural environment, which would serve to catalyze the advancement of both a state and national movement for the legal protection of nature. This story is about the intersection of these four subjects as told through the history of the Pacific Coast Branch of the Chautauqua Literary Scientific Circle (established 1880) as California’s first summer school of science.



A SUMMER SCHOOL OF SCIENCE

The second half of the 19th century was a time in this nation's history when America experienced a great scientific awakening, sparked by a remarkable period of both scientific discoveries and scientific ideas. In 1858, the first fossilized dinosaur skeleton to be found in the United States was unearthed in Haddonfield, New Jersey; a finding soon eclipsed by the discovery that the American West held some of the richest fossil fields on Earth. These discoveries coincided with the new scientific ideas put forth by Charles Darwin in *The Origin of Species*, published in 1859. This was a period in American history when geologist and paleontologists were uncovering fossils that proved life on earth was over several hundred million years old, and astronomers began to theorize the formation of the galaxies from whirling gasses in outer space.¹

The American public quickly became impassioned with desire for a deeper understanding of the natural world. As a result of this new-found interest in nature, the study of natural history experienced a remarkable emergence in the United States, accompanied by an enormous zeal, amongst both amateurs and professionals alike, for collecting "objects of nature."² Throughout the United States, in large cities and small towns, was heard a clamor for establishing natural history museums and for collecting, classifying, cataloging, and exhibiting the treasured objects of nature.

Accompanying this sudden increase in the American public's interest in nature was the development of an educational phenomenon that became known as the "Nature Study Movement." This movement was, in part, the result of an educational experiment that took place at America's first summer school of science held at America's first

seaside laboratory, on an uninhabited and remote island, some twenty-five miles off the coast of Massachusetts, named Penikese. The person largely responsible for organizing this first summer school of science was a Harvard professor named Louis Agassiz. As we will learn, Agassiz's purpose in establishing this seashore program of education was not to advance scientific research but to introduce to instructors, who themselves were in the position of training schoolteachers, a more effective method of teaching nature study to students.

We begin with an introduction to Louis Agassiz, for it will be his method of teaching natural history that will migrate across the continent, to the farthest reaches of the Western United States, and be adopted as the method of instruction by the instructors of California's first summer school of science in Pacific Grove, California: the Pacific Coast Assembly of the Chautauqua Literary and Scientific Circle (est.1880).

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 Biennia, where he spent four years studying ancient and modern languages. It was during this period that Agassiz's interest in natural history arose, while during school vacations, he took up the practice of organizing collections of objects of nature.³ Though his father wanted him to join the clergy, his early interests in natural history could not be resisted. As a result, Agassiz chose to pursue the study of medicine, in line with his interests in nature.⁴

In 1824, Agassiz entered the University of Zurich, where he pursued zoological investigations under the Swiss physician and naturalist Professor Heinrich Rudolf Schnoz. Agassiz next studied at the University of Heidelberg, under Friedrich Tiedemann, Professor of Anatomy and Physiology. In 1827, Agassiz transferred to 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, utilizing the material that had been collected by a scientific expedition sponsored 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 curative Spix, descripsit Agassiz*" and included 91 lithographic plates. It was in this work that Agassiz began to establish his reputation as a naturalist.⁵

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.⁶ 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 sci-

ences in the early 19th century.⁷ Agassiz remained in Paris, until Cuvier's death in 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.⁸ Agassiz chose to remain at College of Neuchâtel and continue his studies of natural history. His next work, titled *Natural History of the Freshwater Fishes of Central Europe*, was published 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.⁹

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 that presented further evidence for his theory *Système Glaciaire*, ("Glacier System") published in 1847.¹⁰ 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. As such, by the time Agassiz arrived in America, he was uniquely positioned to become a leader in American science.¹¹

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.¹² Fresh from Switzerland, he found himself welcomed in America like the prophet of a new religion.¹³ From the moment of his arrival, he began the mission of advancing both science and the teaching of science in the United States. He had traveled to America at the invitation of textile magnate and Harvard University supporter John Amory Lowell, who requested Agassiz present twelve lectures on the three subjects, "*The Plan of Creation as shown in the Ani-*

mal Kingdom, Ichthyology, and Comparative Embryology” at the Lowell Institute of Boston, Massachusetts.¹⁴ 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.¹⁵ So great was public interest to hear these talks of science that Agassiz found it necessary to offer his lectures each day to a second audience.¹⁶ It would be these lectures for the Lowell Institute that initiated Agassiz communication of science to the American public for the next twenty-seven years of his life.

With every series of lectures that Agassiz presented thereafter, 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!”¹⁷ 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*.¹⁸

Several months after this lecture series, in January 1848, Louis 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.¹⁹ That very year, Louis Agassiz was officially appointed to position of Professor of Zoology and Geology 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 country’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 numerous 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 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.²⁰ 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;

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

Joseph Le Conte, 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;

Alphas Spring Packard Jr., Professor at Brown University;

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 Kirkland, 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 Kirkland, 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.²¹

Not only did Louis 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.²²

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.²³ 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 and several wooden tables that provided space for dissecting specimens. It was within this small wooden shack that Agassiz began to organize his collection.²⁴

Within a short time, Agassiz's collection of objects of nature would outgrow this wooden shack.²⁵ In 1850, to further support his efforts, the University provided Agassiz with a larger storage space in the basement of an old building on the Harvard campus and began to appropriate a small amount of funding each year toward the care of the collection.²⁶ 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.²⁷

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 these specimens of nature, under the direction of Louis Agassiz, with the condition that the institution should always be referred to as The Museum of Comparative Zoology.²⁸ 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. ²⁹

And so it was that by the year 1859, the very year in which Charles Darwin's *Origin of Species* appeared, Louis Agassiz had 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, Louis Agassiz discusses establishing the museum, and the 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 ³⁰

Many of the students who were trained by Louis Agassiz at the Museum of Comparative Zoology later featured prominently in the history of natural science in America; becoming professors at Harvard or other universities; or the leaders of major natural history museums, which were rapidly being established throughout the United States.³¹ Among these were Albert Smith Bickmore, who is credited for the design and creation of the American Museum of Natural History in New York City³², 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.³³ Even with the completion of the Museum of Comparative Zoology, Louis Agassiz continued his drive to popularize nature study, by extending the teaching of natural history beyond the walls of the museum into school curricula, and thereby advancing the scientific literacy of the American people.

LOUIS AGASSIZ'S ASPIRATIONS

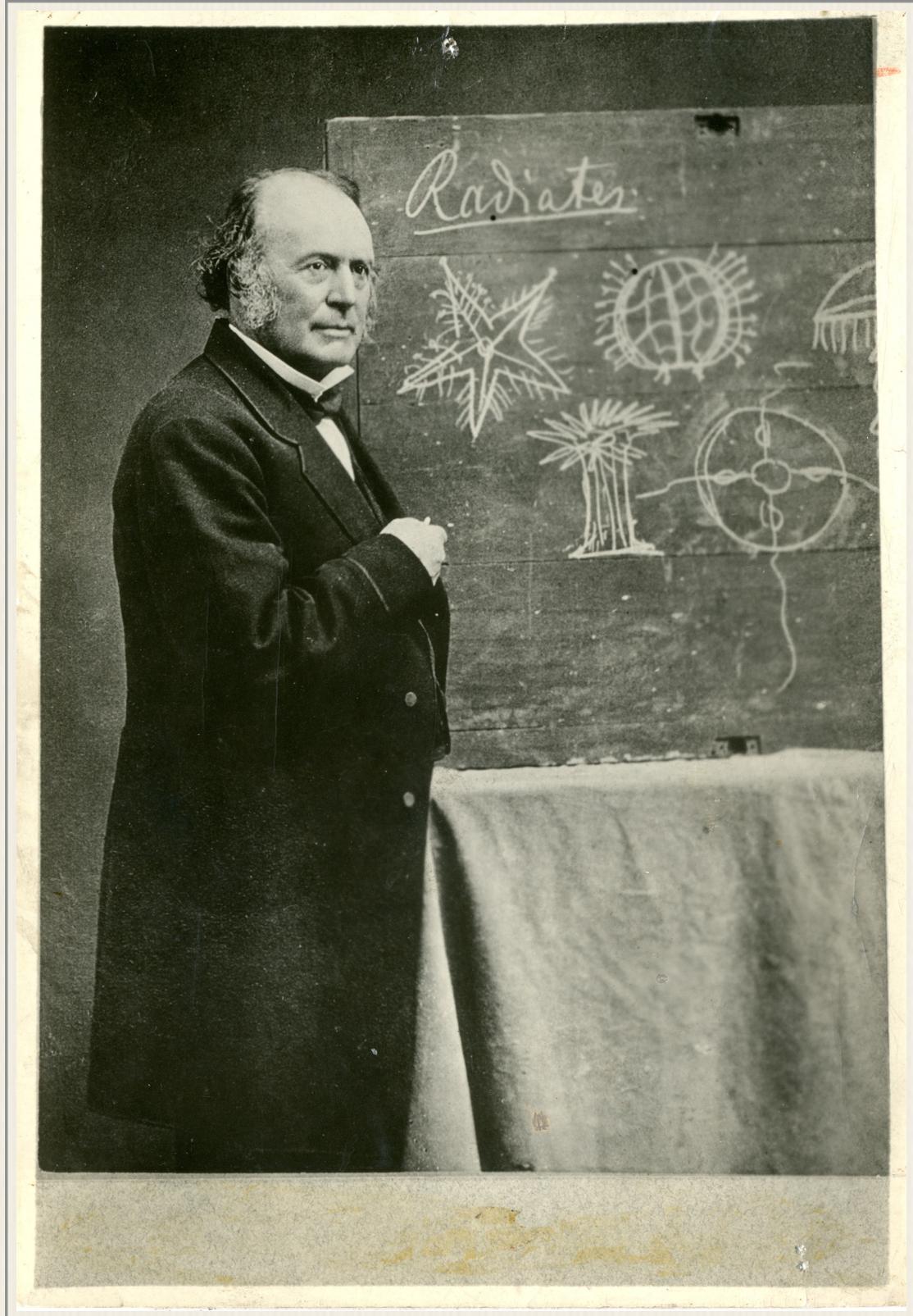
Louis Agassiz was a man who had many aspirations during his lifetime. One of his aspirations was nothing less than the complete transformation of how American society as a whole related to, talked about, and studied nature. To this end, Agassiz aimed to introduce his method of nature study into the curricula 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.³⁴ As a charismatic, well-respected Harvard professor, he was frequently invited to speak to the general public. 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.³⁵

As poignantly described by Sally Gregory Stimpson, *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.*³⁶

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 mechanical way. On these he was able to exert no influ-

ence. 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.³⁷



Louis Agassiz at the chalkboard.

Photograph courtesy of the Marine Biological Laboratory Archives.

THE ANDERSON SCHOOL OF NATURAL HISTORY

In 1873, during the last summer of his life, Louis Agassiz would conduct one final experiment in education and obtain the extraordinary results he had long sought. In this last effort toward advancing the scientific education of the American people, Agassiz set about establishing America's first seaside laboratory, the Anderson School of Natural History, to serve as America's first summer school of science. The spark for this summer school of science is credited to Nathaniel S. Shaler, who first suggested the possibility to his college professor, Louis Agassiz. The original idea was to establish a seaside laboratory on Massachusetts' Nantucket Island, to operate during the summer, for the education of both university students and science teachers of secondary schools.³⁸

What Agassiz did not know at the time, was that the results of this final experiment would fulfill his grand aspiration, as his 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.³⁹ 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.⁴⁰ Agassiz's final experiment in education, the Anderson Seaside Laboratory of Natural History, was his attempt to remedy this problem. The purpose that Professor Agassiz had in mind when establishing this seaside laboratory was not to advance scientific research but to introduce to instructors, who themselves were in the position of training school teachers, to a more effective method of teaching the study of nature to students.⁴¹

On December 14, 1872, twelve months to the day before his death, Agassiz issued the following 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 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.*⁴²

Agassiz is emphatic in the circular that his primary intent for the summer school is to introduce teachers to the instruction of natural history 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. Along with the use of the island, Anderson provided a fifty-thousand dollar endowment for the school. Additional donations were provided including a quickly constructed building that provided fifty-eight rooms for lodging on the second floor and a yacht with 80-ton cargo capacity for collecting purposes.⁴³

The next step, in the spring of 1873, was for Agassiz to personally select, from over one hundred applicants, forty-four students to attend the summer school on Penikese Island. These chosen students, twenty-eight men and sixteen women, were primarily instructors from seminaries, normal schools, and small colleges who themselves, at their own institutions, were in the position to of training schoolteachers.⁴⁴ In doing so, 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.

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, twenty-five 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 impromptu lengthy lecture emphasizing the summer's theme: students attending the Anderson School would "study nature, not books."⁴⁵

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.⁴⁶ The course 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.⁴⁷ 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.*⁴⁸

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 become leaders in what eventually became this nation's "Nature Study Movement."⁴⁹ 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 for a second successful summer session. Regrettably, Alexander's idea of relocating the laboratory to the more convenient locality of Woods Hole was let drop; as 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.⁵⁰ As a result, the buildings and facilities of the Anderson School on Penikese were abandoned and allowed to rot slowly away.⁵¹

As fate might have it, like prophets of a new-found religion filled with missionary zeal, six of the students in the Penikese class of 1873 would go forth and establish their own seaside laboratories. Agassiz's educational experiment on Penikese Island (1873-1874) was first 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); with Alpheus Hyatt as its founder and director.⁵² Although these first three seaside laboratories were short-lived, the next three facilities to be established remain active today. In 1888, under the leadership of Charles Otis Whitman, the Woods Hole Marine Biological Laboratory was established in Woods Hole, Massachusetts. 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, today 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, the teaching and research facility known today as Hopkins Marine Station of Stanford University.⁵³

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 of seminaries, normal schools, and small colleges, who themselves were in the position of training schoolteachers.⁵⁴ 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 select group of students face-to-face with nature, under the expert guidance of gifted instructors.⁵⁵