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David H. Evans

Marine Physiology Down East: The Story of the Mt. Desert Island Biological Laboratory



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This book is dedicated to my family, especially my wife Jean who has always made my life wonderful; to Leon Goldstein who first recruited me to the MDIBL and was my colleague there for over 30 years; and to my friends and colleagues at the MDIBL and on Mount Desert Island who have made those places special.

Preface

In the summer of 2010, Leon Goldstein left the Mt. Desert Island Biological Laboratory, where he had spent the past 52 summers working on various aspects of nitrogen excretion by marine fishes. That spring, I had been asked to give an historical overview of the research on osmoregulation that had been undertaken at the MDIBL since the late 1920s, at the annual meeting of the American Physiological Society. So the who, what, and when of my predecessors and colleagues at the MDIBL were on my mind. Leon's departure precipitated this book, because he had recruited me to the Laboratory in 1978, and because he was the last to leave of what one might call the Third Generation of the MDIBL. I realized that summer that connections to the past of the Laboratory were fading fast and should, therefore, be documented for previous, current, and future scientists and friends of the MDIBL.

I hope that this book serves that purpose. I have tried to give a balanced account, introducing all of those scientists who spent more than one or two summers at the MDIBL. I have, however, introduced a few colleagues who were here more briefly, because they went on to make substantial contributions to Science. In this way, I hoped to demonstrate that a laboratory like the MDIBL might play a role in the career of even those who did not return summer after summer. Depending on the available sources, I have incorporated personal reminiscences of scientists or family members to give a sense of the place. In most cases, these memories have been quoted from chapters in either an unpublished history of the Harpswell Laboratory by Mary Frances Williams (1985) or the Centennial book that was edited by Frank Epstein (1998)—each is a truly superb resource. And I have often quoted directly to retain the personality of the original author. An equally important resource has been the annual Director's Reports that are still available in the MDIBL Archives. Annual Reports and Director's Reports have become a Development tool in recent years, but for most of the twentieth century they carefully outlined the yearly history of the Laboratory, giving insights into the decisions and personalities of the administration. Again, I have quoted directly in many cases, because the past Directors were often very thoughtful, and droll, in their recounting of the past year. A third resource, Google, has to be mentioned, because that Internet search engine provides instant, and interlaced, access to documents that

took years to accumulate until the recent past. From scientific papers (yes, Medline was also used) to obituaries to Wikipedia articles, Google allowed me to view documents that are relevant to most of the MDIBL researchers that I wrote about.

The book is long because I wanted to provide a comprehensive accounting of the history of the MDIBL, which encompasses over a century. But I hope that my coverage is reasonable and biased more by available information than my own research and personal interests. My target reader is someone who might want to be reminded of their scientific and personal life at the MDIBL, or someone who might be interested in the history of one of the oldest marine laboratories in the USA, and the role that that marine laboratory played in biomedical science of the twentieth century.

To provide an historical template of the Laboratory's long list of research scientists, I have provided a Genealogy of the MDIBL, which should demonstrate that the summer investigators were often recruited by colleagues who were already working at the Laboratory. There are, in fact, scientific lineages that stretch back nearly the entire history of the institution; my lineage is a good example: Smith–Shannon–Forster–Goldstein–Evans—going from 1924 to the present. The Genealogy can be downloaded from <http://extras.springer.com/2015/978-1-4939-2959-7>.

Gainesville, FL

David H. Evans

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- Williams MF (1985) The Harpswell laboratory, 1898–1920 (Unpublished)

Introduction

During World War II, Katsuma Dan (Fig. 1), one of the leading marine embryologists of the twentieth century, continued his work on cell division at Japan's Misaki Marine Laboratory on Morioso Bay.¹ By early 1945, however, the Japanese Navy had taken over the Laboratory facilities for a midget submarine base. After the end of the war, that summer, US Naval personnel started the demilitarizing of the facility, and Professor Dan found himself seated at a table with US and Japanese Naval officers, trying to sort out the disposition of the facility and its equipment. As described by Dan: "On one side of a long table three American officers were sitting and on the opposite side two Japanese navy officers and I were sitting. They served beer and canned asparagus with tomato ketchup. This slightly cute menu made me smile. But, oh boy the both sides were pretty much excited. I am sure they were really scared of each other. They yelled whatever they wanted to say at the top of their voice but never listened to the other side. And an interpreter translated off and on, paying no attention whether it made sense or not. I was partly absorbed in watching the chaos and partly in the asparagus and was still partly absorbing the beer. Neither side understood the other. But to start with neither side knew what they were going to say. Toward the end I was loudly laughing which nobody noticed. Somehow the meeting came to end. So I started to work. I stuck to a major and explained to him that this building originally belonged to the University etc. In ten minutes he began to see the situation. As soon as I saw the sign of dawning in his chaotic mind, I ran back to

¹ Dan had been born, raised, and trained in Japan but had worked at the Marine Biological Laboratory at Woods Hole for many summers in the 1930s.



Fig. 1 Katsuma Dan in the mid-1930s. Original in the archives of the embryo project encyclopedia, MBL, Woods Hole, MA. (<http://embryo.asu.edu/pages/katsuma-dan>) For a photo of Dan nearly 60 years later, see Fig. 5.3

the building, wrote a poster asking soldiers to take good care of the place because it is a research institute, pasted it on the wall and took leave from the back door leaving the noisy bunch there”² (Fig. 2).

² Letter on MBL website: http://legacy.mblwhoilibrary.org/dan/letter_2.html

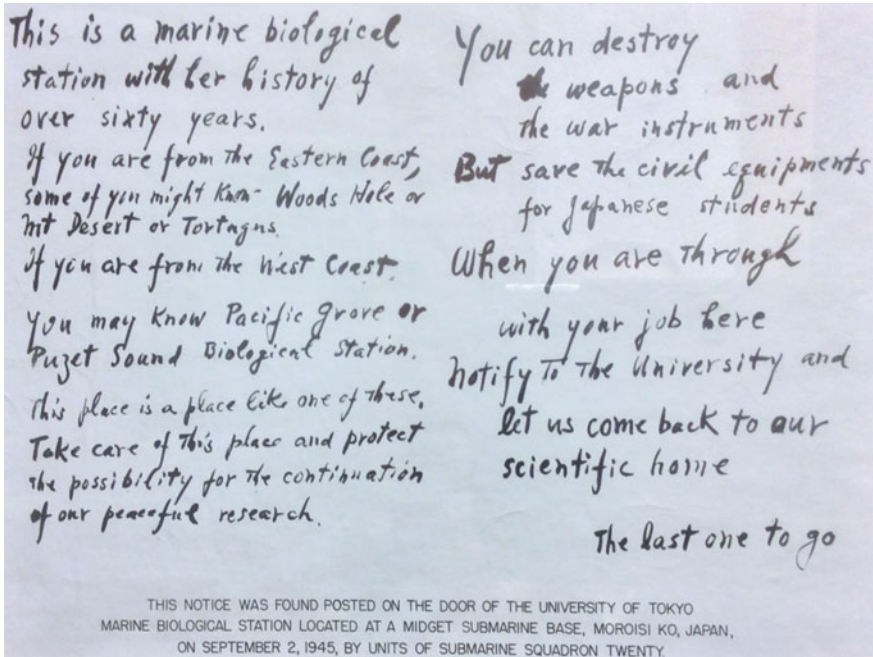


Fig. 2 Photo of the poster that Katsuma Dan left at the Misaki Laboratory at the end of World War II. A copy of the poster now hangs in the Office of the Mt. Desert Island Biological Laboratory

Katsuma Dan's poster was found by US Navy Captain L.S. Parks, Commander of Submarine Squadron Two. He sent the original and photographs of Dan's poster to the Woods Hole Oceanographic Institution in October 1945, asking that copies be sent to the other marine laboratories mentioned in the poster.³

This is the story of one of the institutions noted by Dan: The Mount Desert Island Biological Laboratory.

³ Letter on MBL website: http://legacy.mblwhoilibrary.org/dan/letter_1.html. The original poster now hangs in the lobby of the MBL/WHOI library in the MBL's Lillie Building.

Acknowledgments

Writing is a solitary business, but no writer could function without research assistance from librarians (not to mention the omniscient Google) and critical reading of drafts by friends and family. In my case, librarians at Tufts, Princeton, and the Marine Biological Laboratory at Woods Hole have provided copies of documents and photos, especially pertaining to the early members of the Harpswell/MDIBL communities. The yearly MDIBL Corporation Minutes and *Bulletin MDIBL* were the sources for most of the material in this work, although letters, memos, and newspaper articles in the MDIBL Archives were used when appropriate. The unpublished history of the Harpswell Laboratory by Mary Frances Williams and Frank Epstein's *A Laboratory by the Sea* were invaluable sources, and often quoted.

Various colleagues and friends, namely, Bill Aird, Petty Vettese and Ed Benz, J.B. Claiborne, Suzie Currie, Sue Edwards, Ann Cox Halkett, Kelly Hyndman, and Dan Poteet, read and commented on drafts of early chapters. But only my ever-supportive wife, Jean, took the time to carefully read and catch the myriad of typos and inconsistencies that crept into the ever-expanding list of chapters. Their help was immense, but any mistakes that remain are my responsibility.

Abbreviations

AAALAC	Association for Assessment and Accreditation of Laboratory Animal Care
ABC	ATP-Binding Casette
AE1	Anion Exchanger
AIRI	Association of Independent Research Institutions
APS	American Physiological Society
AQP	Aquaporin
ARRA	American Recovery and Reinvestment Act
ATP	Adenosine triphosphate
BRIN	Biomedical Research Infrastructure Network
Bsep	Bile Salt Export Pump
CA	Carbonic anhydrase
cAMP	Cyclic AMP
CFTR	Cystic fibrosis transmembrane conductance regulator
cGMP	Cyclic GMP
CMTS	Center for Membrane Toxicity Studies
COA	College of the Atlantic
COBRE	Center for Biomedical Research Excellence
COX	Cyclooxygenase
CP	Choroid plexus
CSF	Cerebrospinal fluid
CTD	Comparative Toxicogenomics Database
DAC	Director's Advisory Committee
DIDS	4,4'-diisothiocyano-2,2'-stillbene-disulfonic acid
EPA	Environmental Protection Agency
EPSCoR	Experimental Program to Stimulate Competitive Research (NSF)
EST	Expressed Sequence Tag
FAME	Finance Authority of Maine
GFR	Glomerular filtration rate
GHRH	Growth Hormone-Releasing Hormone
Hsp	Heat-shock protein

IACUC	Institutional Animal Care and Use Committee
IDeA	Institutional Development Award
INBRE	IDEA Network for Biomedical Research Excellence
IP ₃	Inositol triphosphate
Isc	Short-circuit current
LRPC	Long Range Planning Committee
MAP	Microtubule-associated protein
MBL	Marine Biological Laboratory, Woods Hole
MDI	Mount Desert Island
MDIBL	Mount Desert Island Biological Laboratory
MIT	Massachusetts Institute of Technology
MMP	Matrix metalloproteinase
MOAT	Multispecific organic anion transporter
MRC	Mitochondrion-rich cell
MRP	Multidrug resistance protein
MS-222	Tricaine methanesulfonate
mV	Millivolt
NCCR	National Center for Research Resources
NHE	Na/H Exchanger
NIA	New Investigator Award
NIEHS	National Institute of Environmental Health Science
NIH	National Institutes of Health
NKA	Na+K-activated ATPase
NO	Nitric Oxide
NOS	Nitric Oxide Synthase
NSF	National Science Foundation
NTP	National Toxicology Program
NYU	New York University
Oatp	Organic Anion Transporting Polypeptide
OSRD	Office of Scientific Research and Development
PCB	Polychlorinated biphenol
PCMBS	p-chloromercuribenzenesulfonate
REU	Research Experience for Undergraduates (NSF)
RFP	Request for Proposal
Rhg	Rhesus glycoprotein (ammonia transporter)
SAC	Scientific Advisory Committee
SCRF	Salisbury Cove Research Fund
SGK1	Serum/Glucocorticoid Regulated Kinase 1
SNARE	Soluble NSF Attachment Protein Receptor
SPF	Scientific Program Fund
STEER	Short Term Educational Experience in Research (NIEHS)
TASK	Two-Pore, Rectifying Potassium Channel
TMAO	Trimethylamine oxide
TPA	Triaminopyrimidine

USDA	U.S. Department of Agriculture
VEGF	Vascular Endothelial Growth Factor
VIP	Vasoactive intestinal peptide
WGA	Wild Gardens of Acadia

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Chapter 1

Beginnings at Harpswell, Maine

The story of the Mount Desert Island Biological Laboratory began when Dr. John Sterling Kingsley took the Chair of Biology at Tufts College in 1892. The letters of recommendation for Kingsley had been outstanding. C.O. Whitman, who had been appointed as the first Director of the Marine Biological Laboratory at Woods Hole 4 years before, wrote: “your published papers have placed you among the leading morphologists of the country, and that alone should be, in my opinion, your highest recommendation for any chair of zoology. Your editorial work and your experiences in marine laboratories as a teacher and an instructor are too widely known to need any recommendation from me.” President J. M. Coulter of Indiana University stated: “he is one of our best and most distinguished zoologists; is a master of techniques and is fitted in every way to make any laboratory placed under his supervision a centre of the best results both in training and research.” Professor Robert Wiedersheim¹ from the University of Freiburg described him as “a man of great talent, of enduring industry and great energy.” So, on May 7, 1892, Kingsley was unanimously selected by the Executive Committee of Tufts College for the “Professorship of Biology in the College of Letters.”²

As indicated in the recommendation letters, Kingsley had had an illustrious career. Born in 1854, his early schooling was at private academies in Cincinnati and Norwich, west of Albany, New York, and by the age of 12, he was owner and editor of a weekly chemical journal. He declined an appointment to the Naval Academy and entered the Brooklyn Polytechnic Institute. But after the death of his

¹ Wiedersheim was an anatomist, made famous by a book (Wiedersheim 1895) in which he presented a list of 86 organs that he deemed “vestigial.” He reached public notoriety later when his conclusions were presented in testimony supporting evolution during the famous Scopes Trial in 1924 (Darrow and Bryan 1925).

² Handwritten copies of the original recommendation letters and Executive Committee memo are in the Tufts University, Digital Collections and Archives, Medford, MA. The starting salary was \$2000 per year, worth some \$58,000 in 2015 (using the Consumer Price Index), approximately 50 % of what a Chair of Zoology/Biology might expect in 2015.

father, he dropped out of school and worked on various railroads to earn enough money to enter Williams College in 1873 as a junior. Reading *Gray's Anatomy* brought out an interest in medicine, but he joined the Natural History Society and decided to forego a medical career to become a zoologist. Since no American college offered graduate training in zoology at that time, he started work under Dr. A. S. Packard, a noted entomologist, at the Peabody Academy of Science in Salem, MA. Within a year he was appointed Curator at the Peabody Academy. In the next 2 years, he produced a series of descriptive papers on crustaceans, before moving to the Philadelphia Academy of Natural Sciences in 1879.

Kingsley was an exceptional artist, so skilled that he funded his research by illustrating scientific books, journals, and lectures. His reputation in science increased when he edited the *Standard Natural History* from 1882 to 1885, writing parts of the six volumes himself. During this period, Kingsley was enrolled in graduate school at Princeton, and in 1885, he was awarded the Sc.D. for his dissertation “Embryology of *Limulus*.”³ His editorial abilities must have been recognized early, because Kingsley went on to edit the *American Naturalist* (still recognized as the premier journal in natural history) from 1886 to 1896 and the *Journal of Morphology* (still one of the leading journals in morphology) from 1910 to 1920. As H. V. Neal wrote in Kingsley’s obituary in *Science* in 1929: “his long editorial experience combined with a retentive memory gave Kingsley a broader and more intimate acquaintance with zoological literature than is possessed by most professional zoologists.” Before accepting the Chair of Biology at Tufts at the age of 38, Kingsley had been on the faculty at Indiana University, Chair, and subsequently Dean at the University of Nebraska and had spent a year in Freiburg with Professor Wiedersheim.⁴

Kingsley was described as “a small, birdlike, alert man, and the most inspiring scientist whom I met in my undergraduate days” by the noted mathematician Norbert Wiener (1953, p. 111), who went on to found the field of cybernetics. Neal (1929, p. 572) described Kingsley’s work ethic, personality, and teaching skills: “Among the admirable qualities which characterized Kingsley none was more marked than his industry. For him the day’s work began with the dawn, and he rarely allowed himself to be distracted from his allotted task. While in the laboratory he made frequent calls on other workers, such interludes served to refresh him

³ *Limulus* is a primitive arthropod, commonly called the horseshoe crab, and related more closely to spiders and scorpions than crustaceans such as crabs and lobsters. Kingsley’s dissertation provided an extensive developmental and morphological bases for this conclusion. It was published in two parts (Kingsley 1892a, 1893). The complete work is available online as a pdf at Google Books (scanned from a copy of a book at the Harvard University Museum of Comparative Zoology, donated from the Library of Alpheus Hyatt in 1902). For the most complete discussion of this interesting animal, see Shuster et al. (2003).

⁴ This brief history of Kingsley’s early career is extracted from the extensive obituary written by H. V. Neal, who will become important later in this history. See Neal (1929). A more brief and contemporary summary was published in the *History of Tufts College 1854–1896* written by A. B. Start and available at Tufts University, Digital Collections and Archives, Medford, MA.

for renewed exertion. He seemed indeed inexhaustible. His capacity for friendship was notable. Few men have had as wide an acquaintance among zoologists of all countries as he had. Moreover, he was at home with all sorts and conditions of men. Many will recall his genial custom of gathering groups of friends together in Bohemian fashion. Such occasions were more memorable by his sense of humor and unlimited supply of anecdotes drawn from his varied experience. His interests were broad—which serves to define him as the cultured man he was. His published papers cover a surprisingly wide range of problems. He was, however, characteristically a morphologist, and none of his published papers evidences acquaintance with the more recent experimental phases of biology. . . . An exceptionally large and distinguished group of American zoologists remember Kingsley as an inspiring teacher. Through his influence many students were led to take up zoology as a career. His lectures illustrated by free-hand drawings on the blackboard and enlivened by flashes of humor will be long remembered as models of lucid exposition. As a laboratory instructor he succeeded by skillful questioning in stimulating the imagination of his students.”

Kingsley, who also displayed administrative skills in those early years at Tufts, was described as “untiring in his endeavors for the advancement of his department. He found it with very insufficient laboratory facilities; but the new wing of the Museum, designed under his direction could scarcely be improved. His dominant characteristic may be said to be his ability to impart his own enthusiasm to all those connected with his department.”⁵

Kingsley’s dissertation on the horseshoe crab suggests an emerging interest in marine biology, and this was the case. In the mid-1880s, while he was working on his dissertation research, Kingsley was one of the instructors in a marine field course that was offered at the Annisquam Laboratory on the north shore of Cape Ann near Gloucester, MA, which had been founded by Professor Alpheus Hyatt in 1881.⁶ After Hyatt left in 1886 to found the Marine Biological Laboratory at Woods

⁵ *History of Tufts College 1854–1896*, p. 140.

⁶ Professor Hyatt had been a student of Louis Agassiz at Harvard but apparently was not present when Agassiz founded the first marine laboratory in the USA on Penikese Island, near Woods Hole, MA, in 1873. (Jordan 1892). In the 1880s, Hyatt was the curator of the Boston Society of Natural History. The Annisquam Laboratory was funded by the Woman’s Education Association of Boston (WEA) that, along with the Boston Society of Natural History (BSNH), promoted individual, hands-on instruction for teachers of natural science in marine biology. When the WEA felt it could no longer fund the Annisquam Laboratory (1886), and since the area had become relatively polluted, Hyatt met with representatives from the WEA, the BSNH, and representatives from Harvard, MIT, and Williams College in 1887 to “perfect plans for the organization of a permanent sea-side laboratory, to elect trustees and to devise ways and means for collecting the necessary funds.” The laboratory was incorporated in 1888 as the “Marine Biological Laboratory.” Hyatt was the first President (1888–1889) of the Corporation of the MBL. For more complete descriptions of the Annisquam Laboratory and the MBL, see: (Kingsley 1892b; Lillie 1944; Maienschein 1985, 1989; Dexter 1990). For a first-person description of the short life of the Penikese Laboratory, see (Jordan 1892), written by David Starr Jordan, one of the most famous US scientists of the late nineteenth century and Stanford University’s first President (1891–1913).

Hole, MA, Kingsley served briefly as the Director at Annisquam. When the Annisquam Laboratory ceased to exist, and the MBL started teaching students in 1888, Kingsley served on the staff during the summers of 1889 and 1890 (Neal 1929, p. 572). Two years later, Kingsley published what is probably the first general history of the MBL and description of the advantages of studying marine biology there.⁷ So, when Kingsley assumed the Chair of Biology at Tufts in 1892, he was established as one of the leaders in Marine Biology of the last decade of the nineteenth century (Fig. 1.1).

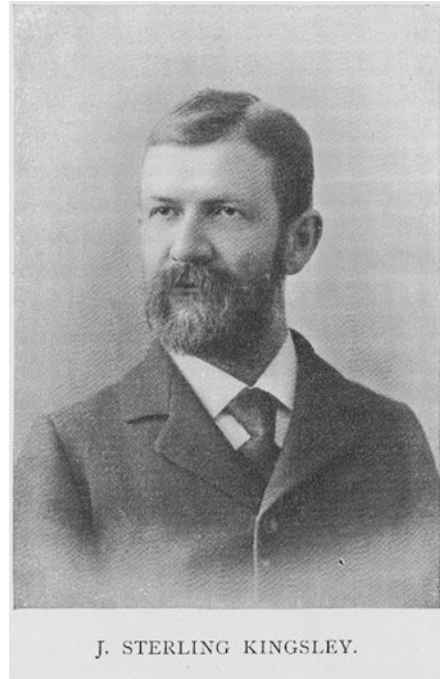
By the end of that decade, Kingsley had left the MBL to establish a new marine laboratory on the shore of Casco Bay, Maine. Before going into the particulars of the origin of what started as the Harpswell Laboratory of Tufts College, it is important to note why the period of 1880–1910 saw a veritable flowering of marine laboratories on both coasts of the USA.⁸ Pauly (2000) suggests: “the basis . . . was a social development specific to the late nineteenth century; namely, the extended annual middle-class resort vacation. In the last decades of the nineteenth century, a plethora of ‘summer colonies’ developed in the mountain and seashore regions of New England. Business and professional families traveled to them for a mixture of

When Kingsley was on the faculty at the University of Indiana during 1887–1889, Jordan was President of that institution.

⁷ Kingsley (1892b). In this substantial, semipopular article, Kingsley argues “the proper place for our studies must have rocky points; stretches of mud and sand exposed at low tide; currents to bring constantly the pure water of the sea; and such localities are not abundant.” He goes on to describe the format of instruction at the MBL: “The instruction given at the laboratory is largely personal. Each student is carefully watched by the instructors, and naturally beginners receive more attention than those in the upper laboratory. They also have their daily lectures upon the general principles of zoölogy and botany. There are frequently other laboratory lectures upon subjects of more general scientific interest. . . given in the evening by the laboratory staff or by visiting naturalists, and no lecture course in the country can boast of such subjects treated by such masters.” Somewhat surprisingly (considering Agassiz’s famous dictum to “study nature, not books,” e.g., Maienschein (1989), Kingsley goes on to state: “To the student of to-day books are almost as important as specimens. He needs them to show him not only what has already been found out, so that he need not waste his time in duplicating the labors of some foreign naturalist, but also to show him the structure or development in allied forms, so that with the larger array of facts he can have a basis for interpreting the meaning of his own discoveries.” He ends with what could be a statement from a current, research foundation Development Office: “We have enough colleges and universities; institutions primarily for research are as yet lacking; yet what honor they would reflect upon the man farsighted and public-spirited enough to give them the means of existence!”

⁸ In addition to the founding of the MBL in 1888 (and the Harpswell Laboratory a decade later), these 30 years saw the origin of many small laboratories that existed for only a few years (e.g., Penikese, Annisquam, Salem Marine Zoological Laboratory in MA, Alexander Agassiz’ lab at Newport RI, etc.) as well as important laboratories that still exist: Cold Spring Harbor Laboratory on Long Island in 1890, Hopkins Marine Station (Pacific Grove, CA) in 1892, Scripps Institution of Oceanography (La Jolla, CA) in 1903, and Friday Harbor Marine Laboratory (San Juan Island, WA) in 1904 (e.g., Dexter 1988). For a very complete and personal history of the founding and early history of the MBL, see (Lillie 1944); for a similar discussion of the SIO, see (Raitt and Moulton 1967), which is available as a pdf from the SIO Archives at: http://scilib.ucsd.edu/sio/hist/caljsioa_gc29r2.pdf

Fig. 1.1 Portrait of J. Sterling Kingsley, taken ca. 1894. Kingsley founded the Harpswell Laboratory of Tufts University in 1898 and served as its Director until 1913 (Original in Tufts University Archives. Used with permission)



reasons: to get away from urban heat and congestion, to get closer to nature and, above all, to socialize in a leisured setting that offered a larger circle of associations than could be found at home but was segregated by ethnicity, class, and interests. The academic calendar enabled professors to participate in this annual migration. Although limited in income most college teachers had the freedom to arrange their summers as they wished.” Maienschein (1988), p. 22 listed why biologists sought to work on the coasts: “They went to the seashore for the variety of organisms at first, then for the particular organisms with their visible eggs and their floating and easily accessible embryonic and larval forms. They went to study those simple organisms, which supposedly more closely resembled the primitive ancestral forms. They went to look for the ancestors of vertebrates and hence of man. By the 1880s they went to find eggs with easily observable cleavage stages and easily manipulated cell organization. They went to observe how changes in environment (such as salt content of water) affect development and differentiation. They could have stayed at home and studied frogs or salamanders, for example, as others did. But the seashore provided such a variety of usable organisms.”

If Kingsley ever spoke of the specific reasons for leaving the MBL, the record has not survived; but we can glean some information from what he wrote in 1903 and from what the daughter of a colleague wrote many years later. In response to a request from the Editor of *Science*, to describe the origin and scientific environment of the Harpswell Laboratory (hereafter termed the HL), Kingsley wrote (1903,

p. 984) that the HL was established “to ascertain the suitability of the location for a research station for the northern fauna and flora.” “Northern fauna” is the key phrase here; because, as stated in this *Science* paper: “there are three distinct faunas on the Atlantic coast of North America—a boreal, a temperate and a subtropical. . .the boundaries between these three faunas are approximately Cape Cod and Cape Hatteras.” He noted that the laboratories at Woods Hole⁹ and Cold Spring Harbor were well positioned to study the temperate fauna, but that no laboratory existed at the point to investigate the boreal fauna, which was often quite different from that around Woods Hole. For instance, Kingsley noted that fully 50 % of the marine species collected in Casco Bay had not been found in Vineyard Sound, near Woods Hole; he suggested, however, that once more collections were made, the number of species unique to Casco Bay may fall to 25–33 %; nevertheless, it is clear that the northern waters needed to be studied. He also argued that since it was “a well-known fact” that the number of individuals of a given species increases with latitude, “other things being equal, the more northern the spot, the more abundant the material and the better the location for a research laboratory.” But, there may have been a more personal reason for leaving the MBL. In an unpublished manuscript about the HL, the daughter of an early investigator, Mary Frances Williams, noted (1985, p. 1)¹⁰ that the son of H. V. Neal, another long-time investigator at Harpswell, wrote her in 1982: “research at Woods Hole had become difficult. It was hard to get specimens and supplies from local fishermen. Sand Dollar embryos, Horse Shoe Crabs, and Spiney [sic] Sea Urchins, Star Fish, and Skates were scarce. Besides, as I read the signs, although I am not an authority by any means, there was a caste system at Woods Hole. It had become a very social place with parties and all that.”

Thus, both scientific and social considerations apparently prompted the move from Woods Hole to Maine. But why Harpswell? Kingsley was clear on that point: “In the discussion of a location for our laboratory the claims of Eastport¹¹ were

⁹ There were two marine laboratories at Woods Hole at this point: the MBL and the US Fish Commission Laboratory, which was established before the MBL (in 1885), under the guidance of Spencer Fullerton Baird, who was the Secretary of the Smithsonian Institution. In fact, Baird was instrumental in bringing his friend, Alpheus Hyatt to Woods Hole to start the MBL. The first buildings of the MBL were built next to the Fish Commission Laboratory, and the latter supplied collecting vessels and laboratory animals for investigators in the early years of the MBL (Lillie 1944; Maienschein 1985, 1989).

¹⁰ Some 20 copies of this important source were privately printed (letter from Mary Francis Williams to David Wynes, March 11, 1987; Archives of the Mount Desert Island Biological Laboratory, Salisbury Cove, ME); one is in the Tufts University, Digital Collections and Archives, Medford, MA, two others are in the Archives of the MDIBL, and copies can also be found at the MBL and Cold Spring Harbor Laboratory. A somewhat abbreviated version of the work was published in 1987 (Williams 1987).

¹¹ Eastport was then, and is now, about as far as one can go on the coast of Maine before entering Canada. Spencer Baird and his students had worked at both Eastport and Portland, ME, during 1872–1874, but came back to Woods Hole for research in 1875 and the following years (Lillie 1944).

considered, but the place was passed by in favor of South Harpswell for the following reasons: The laboratory must be comparatively easy of access. Students should be able to reach it with the least possible expense and trouble, and there must be adequate market facilities for the boarding places of those working at the laboratory. Eastport may be reached by rail by a long, circuitous and expensive journey, or by boat in twenty-four hours from Boston only on alternative days. Again, the facilities for obtaining board are such that the laboratory, as at Woods Hole, would be compelled to establish its own dining hall, and to maintain it under great difficulties and inconveniences. At South Harpswell there are numerous good hotels and boarding houses and the supplies are of the best. So, too, laboratory supplies, bought with all possible foresight, occasionally become exhausted and must be replenished at short notice. Nothing could be obtained at Eastport in less than two days. Harpswell is distant but two hours from the large wholesale city of Portland, and our experience has been that every chemical and reagent desired could be obtained from there on short notice.” And, also importantly, “Eastport lies in the very center of the region of fogs, a most serious drawback, not only to the pleasure of life, but to research as well.” Kingsley concludes this report of the first 4 years of the life of the HL with the summary: “on the whole, our experience has been that no spot north of Cape Cod can excel South Harpswell as a location for a station for biological research,” but with a cautionary note: “The present laboratory, while well adapted for elementary instruction, is, in many respects, inadequate to the demands liable to be made upon it when the richness of the fauna and the charms of the place become better known.”¹²

Harpswell (more specifically, South Harpswell¹³) lies at the end of a peninsula (“neck” in local parlance) that is about ten miles long, extending southwest from near Brunswick, ME, into the middle of Casco Bay, and “fourteen miles from Portland, with which place it is connected, during the summer season, by five boats a day each way” (Kingsley 1903, p. 985) (Fig. 1.2). South Harpswell was a small fishing village and summer vacation area, populated by hotels, boarding houses, private cottages, and “The Auburn Colony,” a group of small cottages built by a group of relatively wealthy families from Auburn, ME.¹⁴ As a Harpswell investigator, Max Morse, described in 1909, this meant that “living facilities, a matter of concern to the average investigator at the summer laboratory, are at their best.

¹² Kingsley (1903), pp. 985–986. It is apparent that conversations with Professor Leslie Alexander Lee of Bowdoin College (in Brunswick, ME) also had played a role in attracting Kingsley to the Casco Bay region (Morse 1909; Williams 1985), but the extent of the discussions has not been recorded.

¹³ The laboratory was historically called the Harpswell Laboratory even though it was situated in South Harpswell. South Harpswell is a village in the Town of Harpswell. They are actually on separate peninsulas, both extending into Casco Bay, with South Harpswell to the west and slightly south of Harpswell.

¹⁴ Williams (1985), pp. 2–3. The colony had been built, along with common tennis courts, in 1876. It burned down in 1899 (apparently due to a disgruntled employee), but much more substantial cottages were built and still stand as of 2015.

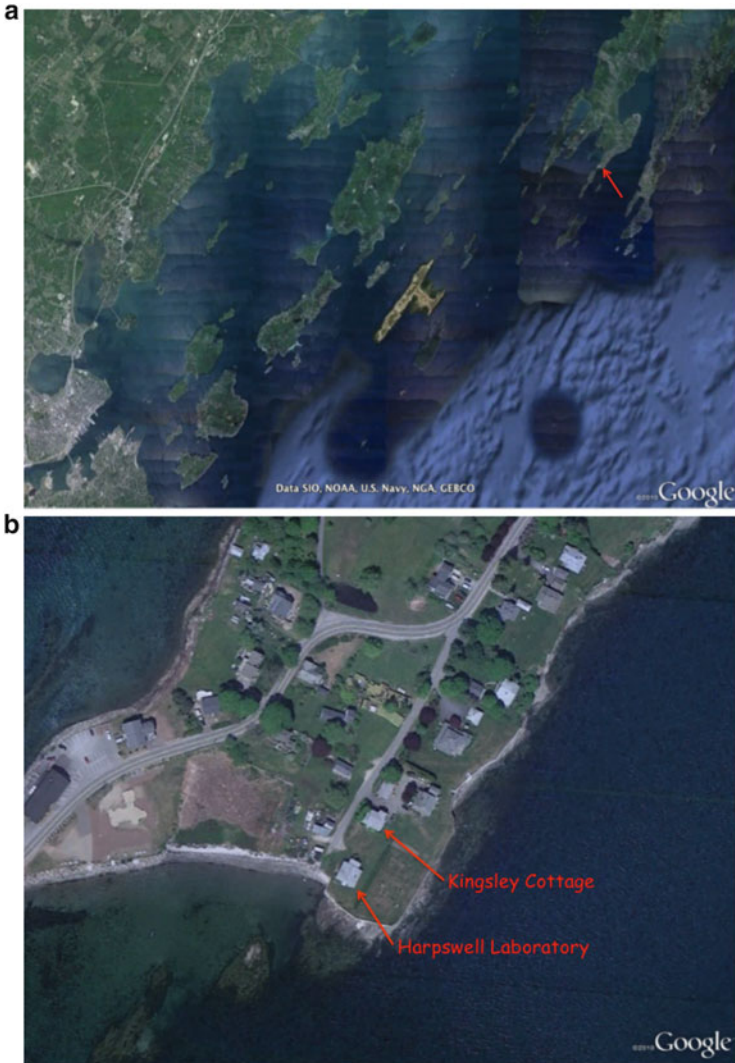


Fig. 1.2 (a) Satellite image of Casco Bay, ME, from Portland (*lower left*) to Harpswell, with the 1902 site of the Harpswell Laboratory indicated by the *red arrow* (Image taken from Google Earth). (b) Satellite image of Graveyard Point, South Harpswell, ME. The modern structures that have been renovated from the original Laboratory and cottages are indicated (Image taken from Google Earth)

One may find almost any mode of living he may desire on Harpswell. If he desires a first-class hotel, he has the choice of three. If he prefer[s] to live in a private house and obtain his meals either in the same house or one within easy access, he may do so. If he desire[s] a cottage, he may obtain one at low rental for the season...Country produce may be engaged and delivered to your door, at very

reasonable rates, while grocers supply the best provisions, being in the main those brought fresh from Portland, a city well known for its splendid markets. Finally, camping is possible either near the laboratory, or farther away amongst the evergreens.”¹⁵

So, in May, 1898, the *Tufts Weekly* published a flier advertising that “The Tufts Summer School of Biology at Pott’s Point, So. Harpswell, ME, will be open from June 28 to August 6” (Fig. 1.3)¹⁶. The advantageous geographical location of the summer school is clearly shown on the flier, as is the building that had been rented for the summer, although it is not recorded whether Kingsley or Tufts actually paid for the rental. At the same time, an article appeared in the *Tufts Weekly*¹⁷ stating that “The idea of a summer school in biology is a new one for Tufts, and it will require one summer to test the advisability of its continuance. The present outlook is highly favorable, and there seems to be but little doubt that the school will become a permanent institution. . . The entire biological department of the college is interested in the venture and several members of the department are laying plans to attend.” The summer school students that year consisted of four undergraduates from Tufts (including two women), one undergraduate from Colby College, three graduate students from Tufts, a woman from Amherst, MA, and a physician from South Boston.¹⁸ In a very short history of the HL, written by Kingsley in 1921, he remembered: “The work was done on the ground floor of the cottage, while several students roomed on the second floor.”¹⁹ As noted in Williams’ reminiscences, such an arrangement must have meant that “the odor of formaldehyde, plus various fishy smells, invaded the bedrooms upstairs, then ventilated only by a window in each of the two gables” (Williams 1987, p. 84). Figure 1.4 is an enlargement of “The Laboratory” from the flier, as well as a picture taken in 2011 of the same structure. The article in the 1898 *Tufts Weekly* stated that [the laboratory] “offers an unexcelled opportunity to spend a delightful vacation which will bring its reward both mentally and physically.” What it neglected to mention was that there was no electricity (South Harpswell did not have electricity until 1928), no running fresh-water, and the necessary seawater and specimens had to be carried “a good half mile uphill from the shore” to the laboratory (*Ibid*).

The HL was not open the following two summers, presumably due to the lack of funds and a suitable site,²⁰ but Kingsley spent those years raising funds, searching for a vacant waterfront lot and designing a laboratory building for both teaching and

¹⁵ Morse (1909b), pp. 512–513. Morse did not return to the HL after 1910 (Williams 1985, p. 120).

¹⁶ A copy of the original advertising flier was found in 1983 in the attic of the MDIBL (the successor of the HL) (Williams 1985) and now is displayed in the office of that Laboratory.

¹⁷ May 18, 1898. Available at Tufts University, Digital Collections and Archives, Medford, MA.

¹⁸ The list of participants in this and succeeding summers at South Harpswell can be found at the end of Williams (1985) and in the Archives of the MDIBL.

¹⁹ The unpublished, eight-paragraph Kingsley history was included in a longer, also unpublished, history written by E. K. Marshall, Jr. and reprinted in a more recent volume (Marshall 1998).

²⁰ Could the students have passed the word around campus that studying at the HL was strenuous and primitive, and not a “delightful vacation” as advertised?

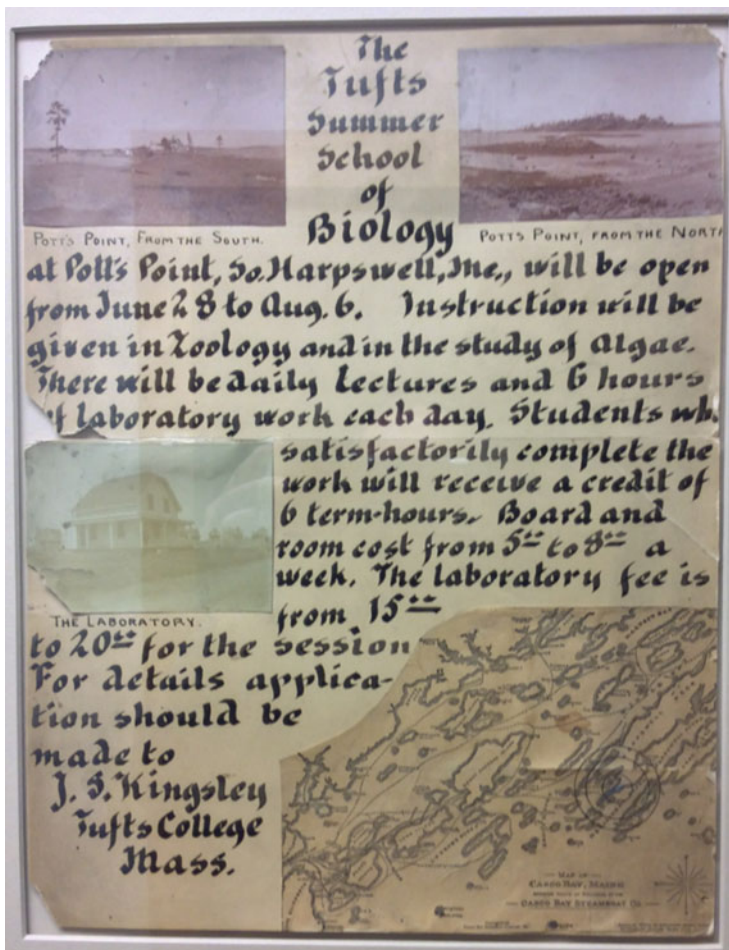


Fig. 1.3 1898 Announcement of the new Harpswell Laboratory and course. Map at *lower right* shows South Harpswell relative to Portland, MD. “The Laboratory” is the building that Kingsley rented for the single summer of 1898. A copy of the original Announcement is now hanging in the office of the Mount Desert Island Biological Laboratory, Salisbury Cove, ME

research (Williams 1987, p. 84). The HL reopened for the summer of 1901, and two years later Kingsley could report in June 1903 “that the whole plant—land, building and permanent equipment—has cost within \$1000. A one-story, wooden building, measuring 24 x 42 f. on the ground, with sixteen windows,²¹ stands directly on the rocky shore a little to one side of a sandy beach. Inside, the space is divided up into

²¹ The original laboratory building (constructed in 1901) was smaller, 24 × 30 ft, with 12 windows and five rooms for investigators and one larger room with three tables for undergraduates. An addition was constructed in 1902 to form the larger laboratory described in 1903 by Kingsley (Williams 1985).