

Edward S. Morse, zoologist: from Maine to Meiji Japan

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Abstract: From the 1860s into the 1920s Edward Sylvester Morse (1838-1925) was a staunch advocate of Darwinian evolution and of science education in the U. S. and likewise for several years in Japan. He had a major impact on the American public's understanding of evolution, both before and after he became president of the American Association for the Advancement of Science in 1886. Without him, the American public would have been less interested in nature and far less cognizant of evolution. Morse is a prominent example of a self-reliant biologist of his era who relished a broad approach to studying the human and natural world, from archeology to zoology.

Keywords: zoology, evolution, science education, museums, Japan, archeology, art

With the onset of Darwinian thinking in the U. S. after 1859, research in the life sciences was profoundly changed. It was “a wonderful transformation.”¹ As a result, ways of teaching science in the lecture hall, the school room, and the natural history museum also felt the impact of Charles Darwin's *Origin of Species*. Edward Morse was a central figure in these related endeavors for over half a century. Today, however, he is largely unrecognized as an American pioneer of the evolutionary mindset in biology. For his most active scientific period, from the 1860s through the 1890s, historians have largely emphasized events outside of Morse's New England area, such as federally-sponsored science in Washington, D. C. and elsewhere.²

Morse is noteworthy for two principal reasons. One, he was an early supporter and publicist of Darwinian evolution and, two, he was influential in the development of science education as a viable part of American culture. Moreover, the trajectory of his life history was unusual, even beyond most of the other American scientists of his era who had wide-ranging careers. To show how Morse integrated his activities, I first consider his own life history, then his evolutionary views and their application to sanitation and education. In this regard, I note that while Morse was somewhat like Thomas Huxley in England in his evolutionary views and scientific interests, Morse was, in contrast, a strong selectionist. Lastly, I consider Morse's interest in art and his social values in relation to the foregoing. I conclude that Morse's accomplishments mark him as a leading, though often overlooked, figure during the transitional period that was post-*Origin* but pre-specialized in biology.

Life history

Morse was to develop from a student of nature in Portland, Maine to a prominent American zoologist, an educator on evolution, a world traveler, and an art historian during his lifetime.³ In a veiled reference to his younger self, the octogenarian Edward Morse recalled how he was inspired to be a naturalist by attending meetings where “scholarly men were soberly discussing the habits of the common worm, or the structure of a beetle’s leg” or “seriously admiring little shells in a pasteboard tray,” and where his small collection of zoological objects that unsympathetic neighbors had “laughed at or sneered at...were regarded by those men with interest and respect. Alas, those blissful days have passed.”⁴

When Morse was twelve years old and bored with school, he collected shells washed up with the tide and traded them for exotic specimens that sailors brought from faraway places.⁵ His display cabinet grew and became admired by mollusk enthusiasts. By the age of 16 Morse had bought his first microscope with money he made by starting work as a draftsman. At 17 he became a board member of the Portland Society of Natural History.⁶ Because he also collected local land shells, a year later he could proudly describe a new species of *Helix* snail he found in Maine, at a meeting of the Society of Natural History in Boston.⁷ His reports to this society and his connections with other malacologists led to Louis Agassiz hiring him at Harvard.⁸ Shells introduced Morse to a global perspective and to biological variation. Shells eventually led him to become a zoologist, an archeologist, and an art connoisseur.

Agassiz hired the 21-year-old Morse as a biological illustrator in November 1859.⁹ While the young man’s handwriting was almost illegible, his talent for drawing animals was impressive.¹⁰ Morse also attended lectures at Harvard, although he had previously been a school drop-out. With the publication of Charles Darwin’s first paper on natural selection in 1858, with Alfred Wallace, and his *Origin of Species* in 1859, evolution soon became a hot topic of discussion in Boston. Agassiz sniped at Darwin, asserting that lingula (a brachiopod) had persisted for millions of years virtually unchanged, thereby invalidating—in his Swiss Calvinist view—Darwin’s idea of selected hereditary modifications leading to new species over time.¹¹ Morse knew that species diversity was common in mollusks because he had collected land and sea shells, including fossil shells in Atlantic-coast Indian middens.¹² Under Agassiz’s bidding Morse studied the brachiopods—a curious group common in fossil records but not typically molluscan.¹³ He came to regard lingula’s survival not as an argument against the Darwin-Wallace theory of evolutionary change but as evidence of its adaptation to widespread muddy estuaries and what he called its excessive vitality.¹⁴ Having matured from a young shell collector to a zoologist studying the animals inside the shells, and because marine brachiopods (lamp shells) were rare in Atlantic waters, Morse determined to go to Japan specifically to study its many kinds of these odd creatures.

The young Morse long has a restless streak. He left school early, left his pious father and two factory jobs as a draftsman, left an assistantship with Agassiz in Boston, and by the age of 38 left as a naturalist for Japan. In the Boston case, Morse quit the Harvard job soon after the American Civil War broke out in 1861, the first of Agassiz's students to rebel against his authority.¹⁵ Morse's father had recently died and he returned home to Maine and his family.¹⁶ After he had volunteered for the Union army and been rejected because of tonsillitis, he became a free-lance science lecturer and illustrator in Maine and also, in 1863, a married man. Following the war, he and other former students of Agassiz became staff members of the new Peabody Academy of Science in Salem, Massachusetts in 1867.¹⁷ There they organized a natural history museum, carried out field studies, and started the *American Naturalist* in 1867 and the American Society of Naturalists in 1883. They published the *American Naturalist* for over 10 years.¹⁸ It was the first prominent American science journal for the general public.¹⁹

In 1868 Morse was paid \$1000 per year at the Peabody as its curator of radiata and mollusca, not a trifling sum at the time.²⁰ To experience wider horizons, in 1870 he left the Peabody. He rode the trains on the new transcontinental railroads, captivating audiences from Maine to California with his popular "chalk talks" on natural history and not incidentally increasing his income.²¹ He also taught at nearby colleges, including Bowdoin and Harvard. At Bowdoin he was the professor of zoology and comparative anatomy for three years. In 1870 he published a paper showing by means of anatomical and embryological evidence that brachiopods were allied to annelids, not mollusks as most taxonomists had thought, a paper that prompted praise from Darwin.²² To help finance his trip to Japan, in 1875 Morse published his popular textbook, *First Book of Zoology*, at a time when zoology was becoming a recognized area of study.²³ The first printing sold out in ten days, and the book, which contained 158 of his illustrations, soon appeared in German and Japanese editions.

Still itinerant, in 1877 Morse declined an invitation to set up a science department at Princeton University.²⁴ He had other plans. Determined to study the "30 or 40" species of brachiopods existing in Japan, finally—with the help of a benefactor—he sailed to Japan in the spring of 1877 for a stay of several months. There he studied coastal sea life, setting up Japan's first marine biology laboratory near Tokyo Bay on the near-shore island of Enoshima.²⁵ While this laboratory debuted five years after Louis Agassiz had started a marine biology summer school on Penikese Island in the U. S., it predated the start of the Woods Hole Marine Biological Station by eleven years.

On Morse's first trip into Tokyo from the port of Yokohama he noticed a shell midden (*kaizuku*) under a few feet of loam in a fresh railway cut near Omori village.²⁶ The shell mound turned out to be huge, over 200 ft. long and 6 ft. in height.²⁷ In excavating the midden later that year, he and four Japanese students found an immense number of pottery sherds, deer and pig bones, and a few bone tools, thereby initiating modern archeology in Japan. This work also soon became useful for Morse to help

explain biological evolution to the Japanese, largely because of the changes he found in local marine shells over time.

The Japanese liked this genial, enthusiastic man and within days of his arrival appointed him as professor of zoology and physiology at Tokyo University and invited him to start a zoology department there.²⁸ While lecturing on zoology at the university, he started the Biological Society, which later became the Zoological Society of Japan.²⁹ He also started the university's zoological museum and gave a series of talks on evolutionary biology to the university community.³⁰ He wrote that most people in the lecture audience took notes and that: "it was delightful to explain the Darwinian theory without running up against theological prejudice as I often did at home."³¹ The Darwinian idea that nature is always changing and that humans are inside nature, not outside of it, was compatible with the Japanese animistic ideas of Shinto and much of Buddhism.

At the same time, many Japanese of the day understood biological evolution by means of natural selection to be a Western philosophy, not a scientific theory based on accumulated evidence.³² In an important sense, the theory did help the Japanese to appreciate science in general.³³ At the same time, the Japanese took the evolutionary framework mainly to mean Social Darwinism, especially as this "scientific truth" of international competition (and predation) was applied to the notion of Japanese superiority to other cultures in terms of "spirit."³⁴ Young, educated Japanese of the late nineteenth century saw this "Western wisdom" as being useful to a Japan that was modernizing under the strain of unequal treaties imposed by the West.³⁵ Indeed, Morse had been the one who recommended to the Japanese at Tokyo University that they hire a certain American political philosopher, Ernest Fenollosa, who publicized Herbert Spencer's "survival of the fittest" in social rather than biological terms when he arrived there.³⁶ But Fenollosa was not alone in this endeavor as two influential Japanese men at the university had already taken up Social Darwinism in a nationalistic context.³⁷

The next year Morse returned to Japan, this time with his family, to teach evolutionary biology at Tokyo University.³⁸ His interests also included the Ainu of Hokkaido, firefly flashing, and the embryonic foot anatomy of birds.³⁹ Returning to the U. S. after his second Japan trip, Morse became the director of the Peabody Academy of Science in 1880, where he created artistic and informative museum displays for public education and also increased funding.⁴⁰ He retired from this post in 1916, at the age of 78, but continued working as the emeritus director.

Although the science-explorer was designated the science-administrator in 1880, he didn't stay close to home. Already in 1882 he had returned to Japan to see the new zoological museum building at Tokyo University and its exhibits on view, just as he had planned it earlier. Then he turned his attention mainly to human studies, most notably on Japanese architecture and ceramics.⁴¹ With undiminished curiosity, he also studied sanitation, the tea ceremony, and Noh chanting on this seven-month trip.⁴² Then he

globe-trotted eastward via China, dawdling in European art museums before returning to Salem and American life.

Over his long life Morse received many high honors, including two decorations from the government of Japan (in 1898 and again in 1922) plus honorary degrees from Bowdoin, Harvard, Tufts, and Yale.⁴³ He was elected a member of the National Academy of Sciences in 1876 at the age of 38, a year before he went to Japan, and was also a member of European science societies.⁴⁴ He became a fellow of the American Academy of Arts and Science in 1869 and was president of the American Association of Museums in 1911 and president of the Boston Society of Natural History from 1915 to 1919, but his major forum was the American Association for the Advancement of Science (AAAS).⁴⁵

Morse participated in many annual meetings of the AAAS, starting in 1869 when it met in Salem on his home ground.⁴⁶ He continued this participation well into the 1880s. In 1886 he was chosen to be president of AAAS. While president, he influenced the AAAS to lobby government bodies to preserve mounds and relics of archeological interest, on both private and public lands.⁴⁷

In 1876 the country celebrated the 100th birthday of the Declaration of Independence, the British zoologist Thomas Huxley lectured on evolution in New York, and Morse, the newly elected vice-president of the natural-history section of AAAS, spoke on American fossil finds and the descent of man from other primates in a paper entitled “What American zoologists have done for evolution.”⁴⁸ Darwin wrote to Morse that the studies reviewed in this 1879 paper were “astonishing in number and importance.”⁴⁹ After anthropology was split off from the natural history section of AAAS, Morse took the primate theme to the anthropologists in 1884, speaking on “Man in the tertiaries,” a talk in which he deplored the dogma of divine creation and applauded both Darwinian evolution and archeological work on ancient remains in clarifying human prehistory, thereby criticizing Georges Cuvier’s idea of recent human origin.⁵⁰ In his long AAAS presidential address in 1886, Morse handily summarized the findings of a huge number of American field observations, partly anecdotal, on ecological interactions among animal species, protective coloration, mimicry, species range expansion, geographical variation and isolation, geological change, centers of distribution, and non-missing links in horse evolution which had been made over the previous ten years, in addition to recent embryological studies that supported Darwinian theory, including the case of human evolution. While some of this material was what E. B. Wilson in 1901 would call “genealogical speculation,” the important point at the time was that much American zoological work did fit into the evolutionary framework.⁵¹ Zoology seemed to be coming of age. Inter alia, in his 1884 address Morse criticized leading American taxonomists and vertebrate paleontologists for downplaying natural selection in speciation in favor of other mechanisms, such as use-and-disuse. Phylogeny, rather than typological thinking, was “the modern tree of knowledge,” he concluded.⁵²

Morse addressed the anthropology section of AAAS again in 1886, this time on the Japanese technique of arrow release, initially stimulated by his archery practice in Japan.⁵³ He also compared the release technique among other cultures.⁵⁴ In 1887 he spoke to the biology section on “Vegetable parasites and evolution,” in which he theorized that plant parasites arose from free-living organisms via intermediate stages. And as late as 1925 he published his final paper on mollusk morphology. But by the 1890s experimental biology was becoming the American hallmark and American universities were strengthening.⁵⁵ These were not Morse’s forte or niche.

As his life history shows, Morse combined university and public lecturing, research, science writing, and museum work for many years. He continued to do research and museum work, to publish, to give charismatic public lectures, and to smoke cigars into his 80s, indeed up to his death in 1925.

Morse on evolution and religion

Morse wrote little or nothing about some topics current in late 19th century biology such as cellular differentiation.⁵⁶ He concentrated on one concept: evolution by means of natural selection, accepting that the hereditary basis of variability was unknown, just as Darwin himself did.⁵⁷ But as Morse became pro-Darwin he also became a critic of “orthodox” religion.

In 1868 Morse and his coeditors at the new journal *American Naturalist* hedged their bets on evolution to conciliate their readers by writing: “The farmer and grazier are as much interested as the naturalist in all facts concerning the origin of life and of specific forms, whether by direct creation, or by secondary laws as claimed by the followers of Lamarck or Darwin.”⁵⁸ In the same year, in the same journal, Morse also wrote admiringly of “the versatility of the Great Creative Mind” in providing gliding locomotion to the humble garden snail.⁵⁹ Three years later he wrote of lingula being “created.”⁶⁰

Soon thereafter, however, Morse had clarified his thinking and become a dedicated spokesman for selection as a force for survival and reproduction based on fortuitous and heritable variation in populations, a position opposed to “direct creation” or the inheritance of acquired traits.⁶¹ Aligning himself with Thomas Huxley, Morse derided the “orthodox tirades against Darwin [that rely on] misrepresentation.”⁶²

As to acquired traits, he noted that Chinese and Manchu legs were long, in contrast to the oft-described short, bent legs of the Japanese. He also noted that the Chinese sat on chairs and worked standing up while most Japanese sat and worked on the floor, with legs crossed under them. “If,” he wrote, “it could be proven that the shortness of [Japanese] legs was due to this universal custom of sitting, which I do not believe, here would be a good example of the transmission of acquired traits.”⁶³ Morse stopped short of suggesting an effect of natural selection in this case, although his report on cryptic coloration in mollusks clearly assumes adaptive camouflage from predation.⁶⁴ Likewise,

variation in size and shape of fossil shells over long time spans due to changing salinity or other factors illustrated adaptive evolution to him.⁶⁵ While adaptation was an important part of Darwin's thinking, Morse usually talked about phylogeny in his popular lectures on organic evolution, especially human descent from simian ancestors.⁶⁶ By the 1890s Morse had read August Weismann on the germplasm theory, which posited that the environment has no effect on the hereditary transmission of traits. Morse speculated that Weismann's reports, which accepted natural selection but refuted acquired traits, provided a way to reduce crime and poverty, with harsh penalties for criminals on the one hand and, on the other, selective rewards for hard workers such as "wholesome tenement houses" provided with gardens, reading rooms, and entertainment halls.⁶⁷

Like Darwin before him, Morse did not question the Euro-American belief in a social hierarchy, from primitive to civilized status, a common view at the time in his social group.⁶⁸ That is, Morse accepted social evolution, although not necessarily Social Darwinism.⁶⁹ He even classified five types of arrow release in archery as forming a cultural sequence from rude to civilized—from ineffective pulling of the bow string to a powerful technique.⁷⁰

Morse invoked individual selection in terms of the Euro-American view about male choice. He suggested that one unnamed city had beautiful but uneducated and ignorant women while Boston had plainer but intelligent ones, because Boston men valued women's intellect in mate selection whereas other men valued beauty: "Such characteristics have been inherited and gradually accumulated..."⁷¹ In striking contrast to this view, however, Alfred Wallace held that women would increasingly use their superior moral standards in choosing a mate.⁷²

To explain the courtesy found everywhere in Japan, Morse speculated in an address at Vassar College in 1894 that in feudal times those without good manners had been exterminated and "...by a process of selection the well behaved have survived." He added, "Frankness compels me to confess...I have sometimes wished for the power of some selective action to weed out the rude and impertinent in our [American] midst..."⁷³

While Alfred Wallace had invoked a spiritual guiding force for social advancement in the 1860s, a force that superseded natural selection in human affairs, Morse did not.⁷⁴ Morse told a AAAS audience in 1887 that, because of Darwin's theory, "Questions of labor, temperance, prison reform, distribution of charities, religious agitators...are now to be seriously studied from the solid standpoint of observation and experiment and not from the emotional and often incongruous attitude of the Church."⁷⁵

Morse went further. Since earth has evolved geologically and biologically, he argued that other planets must also have evolved. The astronomer Percival Lowell, an admirer of Morse's knowledge of Japan and of his advocacy of biological evolution, introduced Morse to the planetary view, especially about Mars.⁷⁶ Morse visited Lowell for over a month in 1905 at his Flagstaff observatory when Mars was in opposition. There the two men agreed the Arizona desert was similar to the dry conditions on Mars.

Narrow lines of greenery only existed in Arizona along irrigation ditches or seasonally along arroyos. Both men became enthusiastic about seasonal canals existing on Mars, backing their claim mainly on guesses from dim telescope images of the planet.⁷⁷

Given Morse's explicit views on evolution, one contemporary critic maintained he was "a Puritan who had outgrown his old faiths and become violently polemic in the other direction," exaggerating "the evils of Christendom."⁷⁸ Let us examine this judgment, taking into account Morse's own vigorous words. While Morse applauded medical missionaries who taught cleanliness with some success, he deplored missionaries who taught dogma alone. Given the exclusion of Chinese women from public life, he could imagine the antipathy of Chinese men to "an aggressive female missionary boldly walking the streets in open daylight in a garb which seems highly disreputable, not to say indecent, and endeavoring in very deficient lingo to induce the people to come to her compound and listen to teachings as alien to Chinese beliefs... as the teaching of Ingersoll to the strictest Presbyterian doctrine."⁷⁹

In a lecture in Japan Morse asserted, "We should not make religion a criterion of investigating the truth of matter."⁸⁰ In the context of Christianity as the enemy of evolutionary theory, he wrote: that an intelligent man can safely "...accept promptly as truth any generalization of science which the church declares to be false, and conversely to repudiate with equal promptness as false, which the church adjudges to be true."⁸¹

Criticism of religion can be intolerant itself. While Morse's criticism was anchored in zoology, his excursion into planetary astronomy was another venture used to convince people that the earth-centered focus of Christianity was in error. Life also existed on Mars, he wrote, as witness the canals observed there. Morse scorned the conservative astrophysicists who were opposed to the idea of extraterrestrial life, just as he berated the conservative Christians opposed to the idea of biological and geological evolution on earth, but he was more successful as a publicist of biology than astronomy. As an evolution publicist he resembled Thomas Huxley in England.

A comparison between Huxley and Morse may be in order at this point. Both men had little schooling, went overseas for field studies, favored science education and public lecturing, and both were morphologists. Scientifically, Morse differed from Huxley in strongly endorsing natural selection and gradualism in evolution, as well as being a persistent advocate of natural history museums and field biology.⁸²

Looking at the Darwin revolution in a broader context, Darwin's supporters after 1859 prominently included Huxley and Joseph Hooker in Britain, but Americans are less often mentioned in this regard. For America, Louis Agassiz is often cited as an opponent and Asa Grey as a supporter, but the younger man, Morse, was noticeably resolute and influential in disseminating Darwin's ideas in the United States long after Huxley, among others, had died.⁸³ J. S. Kingsley wrote that Morse led all others in bringing "the great mass of thinking people in America to the acceptance of Darwin's work."⁸⁴

On sanitation and health

Morse was a multifaceted social critic, with a flair for unglamorous subjects. Aware of the health risk from pathogenic microbes, he was a staunch crusader for public hygiene, especially sanitation. In 1893 he published a paper on “Latrines of the East” after he had visited China on his way from Japan to Europe. “The proper disposal of human excreta is a subject of vital importance,” he wrote, having observed “depths of filthiness” in Chinese cities.⁸⁵ For American cities, in contrast, “Plumbing has become a new profession—a science, in fact, since the enlightenment of the public on sanitary matters.”⁸⁶ In one of his rare accolades for Christian missionaries, Morse congratulated those in China who preach “the gospel of cleanliness,” rather than those “who teach dogma alone.”⁸⁷ China also offered other lessons.

While the Chinese that Morse encountered drank only hot soup or tea, they suffered waves of cholera because they used fecal-contaminated waterways for bathing, cleaning kitchen utensils, and as a water supply. The nineteenth-century Chinese, Morse speculated, were survivors of a long struggle for existence against microorganisms and were “evidently immune against microbes that would kill a European outright.”⁸⁸ In contrast, his favorite Asian country, Japan, was a sanitation superstar with functional privies, nearby water and towels for hand washing, and careful application of “night soil” fertilizer to farm fields.⁸⁹ Japan also had instituted compulsory vaccination for smallpox by the 1870s.⁹⁰ Summing up his observations on hygiene, Morse wrote that “the act of ingestion has been accompanied by a certain rude etiquette and with the aid of simple dishes often decorative, while...egestion still places the larger portion of the human race on a level with his simian ancestors.”⁹¹

Morse also brought field zoology into his purview of sanitation. He noted that small commensal animals such as ants and birds that have moved into the human realm are sanitizing scavengers of food wastes and pesky insects (as bird food). But whereas in Japan people tolerated crows, which are efficient scavengers, they were driven out of American towns. An enterprising crow in Japan, he added, gets the most food for itself and its offspring and thus stands a better chance for survival and for increasing its kind.⁹² But sanitation was not Morse’s only concern about public health.

Morse was fortunate that he lived in Salem town most of his life rather than in a noisy, crowded, and disease-prone American city. Even in Salem, the iconoclastic Morse crusaded against noise pollution, including factory whistles and loudly ticking clocks at night, sirens, and boat horns in the harbor. He was also a fresh-air enthusiast, pleased that “...the closed window has become an anachronism and in health and disease alike the open window is one of the most efficient forms of remedy.”⁹³

On education, especially biology education

In Asia Morse was surprised to find a foreigner-run school in Canton attended by only five students. The Japanese were years ahead in adopting a cosmopolitan education: Tokyo at that time had its University, where every student learned English before entering; its College of Engineering; the Foreign Language School that taught French, German, Russian, and Chinese; the School of Chemical Technology; and the Military and Naval College—"all with...thousands upon thousands punctually attending the classes of these institutions until graduation."⁹⁴ This he knew at first-hand.

Morse himself had contributed to those classrooms, as well as giving public lectures in Japan.⁹⁵ Like other foreign academics, he had trained research students, four of whom became leading Japanese zoologists. On his second trip to Japan he also brought 2500 books and articles and 3000 zoological specimens from the United States to Tokyo University.⁹⁶ Later, after the magnitude-8 Tokyo earthquake and fire of 1923 destroyed the Tokyo University library, Morse gave it his scientific collection of 12,000 books. He was 85 years old at the time.⁹⁷

Morse's endeavors in the U. S. were similar. Because he knew many prominent people, he hosted and enlightened savants in the arts and sciences from Europe, Asia, and America at the Peabody Academy in Salem. He also entertained and counseled dozens of Japanese students living in the Boston area at his Salem home.⁹⁸ He welcomed other Japanese visitors to Salem throughout the years, esteeming most those who were knowledgeable about Japanese pottery.⁹⁹

Long before Morse went to Japan, however, he had contributed to the growing interest in natural history in the U. S., particularly by writing his *First Book of Zoology*, in which learning was imparted "pleasantly and effectively [through] a series of short, simple, and extremely practical lessons on natural history which any child can master, and moreover become interested in mastering."¹⁰⁰ This book was designed to lead the beginning student out of doors to discover first-hand how animals "work," an unconventional approach to zoology in the heyday of rote memorization. Agassiz would have agreed; he deplored teaching zoology "by recitation."¹⁰¹

While Morse had been a university professor at times, his closest contact with American students was no doubt through intensive summer schools in Massachusetts, the first at Penikese Island in Buzzard Bay in 1873-1874 and the second at the Peabody Academy in Salem in 1876-1881. Penikese was a small, desolate island south of New Bedford which a businessman, John Anderson, offered to Louis Agassiz for a natural-history school for teachers in 1873. Although Anderson provided money for housing and a barn converted into a lecture hall, the facilities were limited. The core curriculum was general zoology, vertebrate embryology, mollusk embryology (taught by Morse), embryology of other invertebrates, comparative anatomy and physiology of the vertebrates, fish and reptiles, birds and mammals, microscopy, biological illustration, sea fisheries, and marine physics and chemistry. Up to 20 lecturers and laboratory supervisors were employed, as well as boatmen for a dredging expedition.¹⁰² Forty to 50

students attended per year and instructors brought their families along during the seven-week term. Penikese inspired a number of its students to continue zoological training and research, among them David Starr Jordan, William K. Brooks, Charles S. Minot, and Charles Otis Whitman. In fact, because the young Whitman had impressed Morse favorably at Penikese, Morse recommended him as his successor as professor of zoology at Tokyo University. Whitman was another Maine-born Darwin selectionist, one who thought his Japanese students little interested in pure research; he later became the first director of the Woods Hole Marine Biological Laboratories and founder of the *Journal of Morphology*.¹⁰³

After Louis Agassiz died in late 1873, the Penikese school continued for one more year, under Louis' son, Alexander. This first summer zoology school in the U. S. then collapsed.¹⁰⁴ The island was not easily accessible—"absurdly located" in one view. It was also too costly given the few students it could accommodate.¹⁰⁵ Morse, however, recalled Penikese fondly even 40 years later, especially the methodology used there. Without reference books, students found themselves sitting before a tin tray in which a live or dead animal was placed, often straight out of an alcohol jar with "odoriferous juices" and told to study it and report their findings in good time.¹⁰⁶ Morse's four-year-old son, visiting the laboratory one day, asked a school teacher dissecting a cat on a tray, "Miss White, are you trying to mend that kitten?" Morse commented that the cat was certainly in need of extensive repairs.¹⁰⁷

As Penikese in 1873 was something like a cemetery on Sundays, Morse organized a croquet game and other innocent entertainments tolerated by the austere Louis Agassiz. Outside of this Sunday problem, however, Morse found much to laud about Agassiz, especially his "brilliant" lectures and his charming voice, "rich as Apollo's lute."¹⁰⁸ More importantly, Penikese was a precursor to Woods Hole in the 1890s as a biological community site.

Following the Penikese demise, the Peabody Academy of Science, with Morse on board, ran a summer school of zoology for teachers from 1876 through 1881, at which time summer schools became readily available elsewhere with zoology as a popular scientific discipline.¹⁰⁹ The Peabody curriculum was modeled after that devised by Agassiz for Penikese.

By 1880 Morse was head of the Peabody Academy and by 1883 he was writing about the role of museums beyond the function of professional research—that is, in public education. Museums should become a part of both city and country life, he held, especially by combining resources with the newly established public libraries then springing up in states like Massachusetts. Noting that illustrations were important in books, he argued that it was even more important to exhibit the objects of science, art, and local history in a museum setting for all to see.

The combination of museum and library would improve the quality of learning in schools, Morse maintained, because "Lessons from books, and not from nature, have

been the tiresome lot of school children, [tending] to deaden the inquiring spirit.”¹¹⁰ Moreover, while a book on natural history might tell a reader about the elephant and the kangaroo, it routinely ignored the small animals living right on his doorstep. Morse himself had been rebellious at “book cramming, with no reference to the objects...in sight from the windows, or within a stone’s throw of the school door,” and had been astonished as a child to learn that the body of water he saw on a shore road near Portland, Maine was the Atlantic Ocean.¹¹¹

American natural history museums, however, were pre-Darwinian in Morse’s view, lacking any “suggestion of the life history of even a single species” and were essentially “a cemetery of bric-a-brac.”¹¹² Indeed, some were simply storehouses for collections. In this respect, America was scientifically deprived. Museums needed to illustrate the principles of science, Morse maintained, such as phylogenetic development in the animal kingdom, and needed to be useful to students and teachers of science, such as providing lectures on subjects of interest. Museum collections also needed labels by exhibits listing useful books available in the local public library. Continued to concern himself with science education, in 1902 Morse advocated teaching “the great principle of natural selection with its fascinating illustrations from the animal kingdom” in grammar schools.¹¹³

Given the many lectures Morse gave to all ages (and illustrated with lightning, ambidextrous sketches on the blackboard), given his textbook and his leadership in the AAAS, it is fair to say that throughout his life Morse was a “public” biologist, not a white-coat specialist. Had he been asked, “Science for whom?” he would undoubtedly have replied, “Science for everyone.”

On archeology, art, and architecture

When morphological studies in zoology became eclipsed by cell biology and later Mendelism, Morse focused his work on the Peabody and on Japanese archeology, art, and culture. He was primarily interested in evolution as the history of life, including human life, not in cellular mechanisms of inheritance.

Morse held that the theory of human origin from primate ancestors spurred the growth of archeology in the nineteenth century while archeology, in turn, “...contributed to the general correctness of Darwin’s views.”¹¹⁴ Speaking on the study of prehistory, Morse noted that an archeologist of his day has “...one set of critics, generally theological, who deny his facts, or call his evidence spurious [and] another set, generally theological also, who claim for man peculiarities which separate him from all considerations [that] apply to other mammals below him.”¹¹⁵ The human species was not specially created in his view.

The Omori midden was Morse’s first archeological encounter with Japanese prehistory.¹¹⁶ Later Morse traveled widely in Japan to excavate shell heaps, usually

accompanied by zoology students. He also collected zoological specimens, including centipedes in a damp ground hole on one occasion. His excavation methods and quantitative analyses of middens set a standard for the Japanese interested in digging up their past.¹¹⁷ In the Omori case, he found that fossil shells were larger and in some cases differently proportioned from those of the mollusk fauna living in nearby Tokyo Bay and that other fossil species no longer existed in the area, leading him to suggest that species can evolve over quite short geological periods. Morse used the findings from this midden work to introduce his lectures on evolution to Japanese audiences. Charles Darwin commented on the Omori findings as follows: “What a constant state of fluctuation the whole organic world seems to be in.”¹¹⁸

In Kyushu and elsewhere in Japan, Morse found crushed or charred human bones in shell mounds, or ones strongly scratched and cut, that he assumed to be the result of cannibalism.¹¹⁹ He kept to this opinion for many years. Since he had earlier identified shells from middens in the eastern U. S. as part of Jeffries Wyman’s excavation team, and since Wyman attributed broken fossil bones to cannibalism, Morse accepted this idea for bones in Japanese middens.¹²⁰ Indeed, when Morse was in his “midden” period, it was fashionable to claim that prehistoric European “cave men,” Saxons, Fijians, West Africans, and others were cannibals.¹²¹

Morse did not depend much on books to learn about human life, nor was he a shy observer. He *pursued* the human experience, from pottery to latrines. In time, he became fascinated by Japanese domestic architecture and art, both everyday and ritual art. This turned out to be a happy mixture of his artistic and scientific talents. Earlier, as is well known, the same mixture had characterized the work of John James Audubon.

Japanese art was esteemed by American whaling captains, merchant seamen, and military visitors to Japan nearly a quarter century before Morse arrived there in 1877. In 1855, for example, Naval Commander John Rogers wrote of: “The novelty, the scarcity, and the innate beauty of Japanese wares.”¹²²

Morse’s first contact with Japanese ceramics had occurred when he found pottery sherds in the Omori shell midden. Later, in 1878, when he happened across a small dish shaped like a scallop shell in a Tokyo shop, he started collecting and analyzing Japanese pottery, first “shell” pottery and later all kinds of local ceramics. In later life he became curator of pottery for the Boston Museum of Fine Arts and an expert on Japanese ceramics, often consulted by rich collectors such as Charles Freer on the provenance of Japanese items.¹²³ Over the years Morse so favorably impressed a number of prominent Bostonians that they contributed lavishly to making Boston a Mecca for Asian art.¹²⁴ These Bostonians regarded both art and science as worthy endeavors.

Morse illustrated his own books, as well as books and articles written by others. While he wrote one book on zoology, he wrote two on Japanese architecture and culture, *Japan Day by Day* and *Japanese Homes and Their Surroundings*.¹²⁵ These two books portray the reality of Japanese life at a turbulent time, not long after the “black ships” of

Commodore Matthew Perry had appeared with their gunboat diplomacy in 1853 and the feudal Tokagawa shogonate had been overthrown in 1868. Democracy was in the air, and knowledgeable foreigners were welcome visitors. When Morse arrived in Japan in 1877, early in the Meiji era, he was inquisitive about everything he saw, heard, and smelled in this novel environment. He observed Japanese town and country life with his note-and-sketch book in hand wherever he went. As one American reviewer wrote in 1885, Morse wrote on Japan, “not from the British or American, but, as he ought, from the *home* viewpoint...his work makes us understand the reasons for the unique art, etiquette, and growth of the people of the island empire.”¹²⁶ His two books on Japan, as well as several of his shorter works, often extolled the healthy conditions, attitudes, and aesthetics of Japan over those of the United States—even comparing Japan favorably with the rest of the world.¹²⁷ In addition, Morse collected modest, everyday items that few others tried to preserve, items that are crucial for understanding cultural history.

After Morse became director of the Peabody in Salem, he changed its focus to Essex-county natural history along with worldwide anthropology exhibits, arguing that such a small museum should leave general biology to the nearby, larger museums at Harvard and at the Boston Society of Natural History. Fortunately, the old Salem sea captains had collected rare cultural items for the museum not to be found outside their home town.¹²⁸ For Morse, then, art and science were not separate or dissonant. For him, both entailed aesthetic values and systematic study.

Social values

Like many scientists, Morse was independent-minded, methodical, and observant. Besides his dedication to zoology and his zest for Asian experiences and evolutionary theory, Morse was a principled man who was never detached from problems of society. He was considerate of others’ needs. His Yankee sense of fair play is apparent in his behavior of sharing with the Japanese whatever he considered valuable. For example, most of the zoological and midden specimens Morse collected in Japan stayed at Tokyo University. The University also wanted Morse to make up small duplicate sets for the Yale, Salem, and Smithsonian museums to be presented to them in order to receive specimens in exchange. Morse agreed to take on this job and accomplished it well.¹²⁹

His large collection of Japanese art, for which he became justly famous, focused mainly on folk objects, but he did buy fine Japanese art at a time when it was considered passé and Western art was being emulated to excess. Morse pointed out to the artist Okakura Kakuso, who organized the Imperial Art School in Tokyo, that the widespread selling of fine Japanese art “was like the lifeblood of Japan seeping from a hidden wound.”¹³⁰ He found it sad that these “beautiful treasures” were leaving the country.¹³¹ These remarks prompted Okakura to lobby Tokyo officials to protect antiquities. As a result, the National Treasures Law (1884) banned export of ancient art and the

government soon began registering the objects still left in the country. By 1885, Japanese artists were again using native ink, brushes, and paper instead of Western substitutes, and the fad of Italian-style sculpture and drawing was over. Morse's call for preserving Japanese art, and thereby culture, resonated well in a Japan that strove for self-esteem by equaling or even surpassing Western strengths and riches.

While Morse has been accused by an early biographer and others of lacking an aesthetic sense—overly interested in utilitarian objects and mollusk classification—his championing of Japanese art, including the tea ceremony, reveals a strong aesthetic and ethnological bent.¹³² Changes in Japanese pottery from ancient midden sherds to tea-ceremony ware also spoke to him of organic development, of progressive evolution perhaps.

Among other matters, when Morse was a young man slavery was prevalent in the world. He may have never seen a slave during the Civil War period or fathomed the effects of slavery at the time, but he did so later. In the aftermath of the war, he set off to collect lingula in the Beaufort Harbor shoals of North Carolina. On the train near Weldon town he conversed with a group of ex-slave “negroes” going to a Republican convention, one of whom was a justice of the peace who was proudly literate and law-enforcing, but Morse also referred to the construction laborers he saw in Goldsborough as “darkies,” a common term in his milieu at the time.¹³³

Then in China in the early 1880s Morse saw a household slave close up. He wrote, “...to see a veritable specimen of humanity that has been bought and sold like a piece of merchandise was, to me, a novel experience.”¹³⁴ This slave girl was meek and uncomplaining but Morse consoled himself that her lot was far happier “...than that of her mistress in that she had her two good [unbound] feet to stand on and could see the activities of the street without impropriety.”¹³⁵ Nevertheless, he held that the African slave in America “...with his dances and songs, freedom in the open air, and ‘possum hunting on a moonlit night might be considered in a state of bliss compared to the lot of a female slave in China.”¹³⁶

Morse also described Japanese women as “slaves,” being somewhat shocked to observe that they walked behind their husbands on the street and led a humble existence. However, they were otherwise treated kindly, he thought.¹³⁷

In general, rather than keeping aloof from social problems, Morse confronted them. He was an inveterate commentator on social practices—in scientific journals, magazines, and local newspapers.¹³⁸ Throughout his career, Morse seems to have looked outward much more than inward, endlessly curious and usually cheerful about life as it was or had been. Today his personality may seem fragmented because of his many interests, but he obviously welcomed almost everything in sight as being consistent with his life-long fascination for natural history, especially the natural history of the human species. As one biographer wrote, “The world was brighter for his presence.”¹³⁹

Overview and conclusion

It is curious that although Morse was a key figure in the early development of zoology both in the U. S. and in Japan, he is far better known today in Japan than in his home country.¹⁴⁰ The Japanese have put up, not one, but three large memorials to Morse's work at Omori and Enoshima, the first in 1898 and the latest in 1985.¹⁴¹ Possibly this oversight in the U. S. is due to the fact that he was more a science publicist and educator than a researcher whose findings had high significance. In addition, while Morse was foremost a zoologist, he was not only a zoologist. He also made inroads into anthropology, archeology, art history, astronomy, and architecture—not a mean achievement for one who never finished school, any school. He was largely a self-made man. As Morse wrote about an earlier American naturalist, Joseph Leidy, but applicable to Morse himself, “One stands amazed at the wide range of his observations.”¹⁴²

Equally important, while Morse clearly helped shape the direction of university and artistic life in Japan, he also pioneered in shaping American views of Japan, through his books, lectures, and prestigious personal contacts in the U. S.—not to mention his strong contribution to the public understanding of science in the America of his day. For him, then, science itself had social value.

What can we learn from the lives of scientists like Morse? Since he was a forerunner to what is now called modern science, he and a few others of his time are in a sense microcosms for the understanding of American science-in-the-making. More than anything else, he is noteworthy for his broad approach to investigating the natural world, including the human world.¹⁴³ As Cicero (106-43 BCE) once wrote, all human arts are bound together and contain among themselves mutual affinities.¹⁴⁴

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¹ Wilson, 1901, p. 15.

² Pauly, 2000, but see Numbers, 1998, on Morse.

³ A sizeable literature exists on the growth of institutionalized biology in the U. .S., covering both educational and research aspects; see Pauly (2000) and Rainger et al. (1988) for reviews. As Pauly noted (2000, pp. 195-199), biologists in Morse's day had broad interests, all considered by them part of their science. Morse exemplified this trait perhaps more than most.

⁴ Morse, 1924, p. 424.

⁵ Years later, in Canton, he found shells of a large land snail which he had preserved in his boyhood cabinet as "a rare and valuable object" (Morse, 1902b, V, p. 75).

⁶ Howard, 1975.

⁷ At the age of 20 he described a second snail species; in total, he described 11 new species during his life (Champion, 1947).

⁸ Hickman and Fetchko, 1977; Champion, 1947.

⁹ On Morse as an illustrator, see Dexter, 1967.

¹⁰ Because he was ambidextrous, he later willed his brain to the Wistar Institute of Anatomy and Biology for postmortem study of this rare trait. Nothing unusual was found (Anonymous, 1928).

¹¹ This occurred earlier in 1859, at a meeting of the Boston Society of Natural History with Morse in the audience (Thayer, 1986). Asa Grey gave a robust critique of Agassiz's position (Grey, 1860).

¹² For example, he and others excavated a large midden on Goose Island in Maine and another at Eagle Hill in Massachusetts (Wyman, 1868). He also studied midden shells in Rhode Island and Connecticut (Morse, 1925).

¹³ He found that fossil and living brachiopods were related through time, not immutable or “fixed” species as Agassiz had prejudged the case.

¹⁴ Morse, 1870, 1871a. The lingula group burrows upright in sandy sediments; some Ordovician strata preserve them in this vertical position (Rudwick, 1970).

¹⁵ Howard, 1925.

¹⁶ The practical older brother of the impractical Edward was the main family supporter (Wayman, 1942).

¹⁷ Benfey, 2003, and Whitehill, 1949, have described the inception of this institution. It started with biological and anthropological collections accumulated from Salem oceanic trading ships. As he would later do in Tokyo, Morse was the one who organized the museum space in Salem for natural history exhibits.

¹⁸ Their object was to amuse and “perhaps decoy [the reader] within the temple of nature...and instruct him in some of its mysteries” (Anonymous, 1868, p. 1).

¹⁹ In the first issue, the editors wrote that they aimed to report on science “for the philosopher and day laborer” (Anonymous, 1868, p. 2).

²⁰ Whitehill, 1949.

²¹ In 1889 he was paid \$75 for a lecture at the University of Indiana (Peabody Essex Museum, n. d., Box 3-8, Folder 3).

²² Darwin and Morse, 1880; see also Dexter, 1966; Morse, 1870. Morse first reported on this work at the AAAS meeting held in Salem in 1869 (Dexter, 1965). The malacologist Dall (1871), one of Morse’s future eulogists, countered Morse’s evidence at the time, holding brachiopods to be essentially mollusks, but Oscar and Richard Hertwig in Munich lauded Morse’s analysis and his ingenuity in anatomical comparisons (Anonymous, 1882). Today, the phylum Brachiopoda is considered by Cohen, 2000, to be allied to both mollusks and annelids on molecular grounds, while freshwater brachiopods are considered by Glenner et al., 2006, to be a likely forerunner of insects.

²³ Anonymous, 1875; “S. L.,” 1875-1976.

²⁴ Champion, 1947.

²⁵ There he first saw the living animals of many Asian shells that he had kept in his boyhood collection.

²⁶ Earthquakes lifted the shoreline many times during the Holocene, raising up former coastal areas, such as at Omori (Kerr, 2007).

²⁷ Morse, 1877.

²⁸ Toyama Shoichi (or Toyama Mazakazu [Wayman, 1942]), formerly a student at the University of Michigan, had met Morse in Ann Arbor and heard him lecture there; later, as an education official in Tokyo, he advised that Morse be hired as a zoologist at the university (Bartholomew, 1989, pp. 64-66).

²⁹ Naohide, 1990.

³⁰ The species concept and phylogeny, let alone comparative anatomy and geology, were not familiar to Japanese at that time (Shimao, 1981).

³¹ Morse, 1917c, vol. 1, pp. 339-340. These lectures were translated into Japanese and published in Japan in 1885 (Laurent, 1994).

³² Watanabe, 1990; Laurent, 1994. This social-political interpretation also occurred in China, after 1895 when Darwinian theory was written about in Chinese (Pusey, 1983).

³³ Morse also gave over a dozen influential public lectures in Tokyo, on everything from glaciers to embryology (Naohide, 1990).

³⁴ Hence the catchphrase in Japan at the time, “Japanese spirit and Western learning” (Nagazumi, 1983, p. 14).

³⁵ Brooks, 1962, p. 106.

³⁶ Brooks, 1962. The materialistic struggle for survival among individuals or groups might better be called Spencerism. Nagazumi, 1983, has traced the spread of Social Darwinism in East and Southeast Asia outward from the inception in Japan fostered by Morse’s recommendation of Fenollosa.

³⁷ Nagazumi, 1983, p. 3; Shimao, 1981. One of these was Toyama Masakazu who received a philosophy professorship at the University of Tokyo in 1876 to teach Spencerism, before he became a government official (Chitoshi Yanaga, 1949).

³⁸ For the first time in his life he was well paid. According to Wayman, 1942, his salary amounted to \$5000 in gold a year, with a house provided; he evidently saved half his salary while living in relative luxury (Jones, 1980).

³⁹ This study of the ankle bones showed a bird-reptile link (Morse, 1872, 1887).

⁴⁰ The Peabody Academy is now the Peabody Essex Museum. Whitehill, 1949, reported that Morse regrouped the human artifacts in the museum to represent separate cultures rather than putting ceramics in one case and weapons in another. One zoologist regarded the Peabody as “the most artistically and scientifically arranged collection of any small museum in the U. S.” (Dall, 1926, p. 158). Pauly, 2000, p. 113, however, thought the Peabody to be “moribund” at this time. Bequests to the Peabody were numerous under Morse’s directorship. Even in the 1930s Jennie Brooks, a student of natural history and the sister of Morse’s secretary, left \$10,000 to the Peabody in memory of Morse.

⁴¹ He meticulously documented the potters’ marks, the kilns, the functions, and the province of origin of the many pieces he had collected (Howard, 1935). He had to learn Chinese writing in order to understand the potters’ marks (Kingsley, 1926).

⁴² Morse had designed this two-story building (Naohide, 1990). He followed and commended Japanese developments in biology for many years (Morse, 1886). As with many of his eclectic pursuits, once he had entertained the idea of Noh chanting, the chanting entertained him. And although he repeatedly decried Japanese instrumental music, he finally grew to enjoy it on this third and last trip to Japan (Benfey, 2003).

⁴³ Kingsley, 1926.

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- ⁴⁴ Anonymous, 1924-1925.
- ⁴⁵ Johnson, 1926. The Boston Society was mainly a science museum by this time.
- ⁴⁶ Salem was the official headquarters of AAAS in the late nineteenth century (Whitehill, 1949).
- ⁴⁷ Anonymous, 1887.
- ⁴⁸ Morse, 1876a, b.
- ⁴⁹ F. Darwin, 1888, p. 233.
- ⁵⁰ His views are given in Morse, 1881; in this essay he accepted reports of human remains in Pliocene deposits but later found them untenable (Anonymous, 1884-1885). Morse also spoke at the 1884 AAAS meeting on the use of the plow in Japan (Wayman, 1942) and on Korean customs, based on his interviews of Koreans in Japan and on his friendship with a Korean student (Anonymous, 1884). The first Korean student to study in the U. S., Yu Gil-chun, studied with Morse in Salem and later, as a nationalist reformer, corresponded at length with him (Nagazumi, 1983, pp. 4-6; Lee, 1990).
- ⁵¹ Wilson, 1901, p. 18.
- ⁵² Morse, 1887, p. 22. This comment on phylogeny refers to Morse's rejection of Agassiz's belief in Cuvier's four body plans (radiate, molluscan, articulate, and vertebrate) since animals cannot be forced "into relationships which have no existence in nature" (Morse, 1902c, p. 419). Morse's phylogenetic lectures encompassed sponges and chalk beds through polyps and coral reefs on up to man and sexual selection (Peabody Essex Museum, n. d., box 3-8).
- ⁵³ Anonymous, 1886. When five Zuni chiefs visited Salem in 1882, on a pilgrimage to the sunrise ocean, Morse showed them Japanese art in his house and at the Peabody Institute. The art was much admired as also were the Japanese arrows Morse presented to them (Proper, 1968).
- ⁵⁴ Morse, 1885.
- ⁵⁵ Wilson, 1901.
- ⁵⁶ See Maienschein, 1991, on this topic.
- ⁵⁷ By the 1910s, Morse was referring to William Bateson, Hugo de Vries, and Mendelism in his writings, but without spelling out his position on their evolutionary implications (Morse, 1912).
- ⁵⁸ Anonymous, 1868, p. 3.
- ⁵⁹ Morse, 1868, p. 7.
- ⁶⁰ Morse, 1871c.
- ⁶¹ He publicly endorsed Darwinian evolution in 1873 at a AAAS meeting in Portland, Maine, not long before his early mentor, Agassiz, died that year (Wayman, 1942). Some American naturalists of the time accepted the inheritance of acquired characteristics; one of these Neo-Lamarckians, A. S. Packard, named Morse as being anti-Lamarckian (Numbers, 1998, p. 172).

⁶² Morse, 1878, p. 213. What some Neo-Lamarckians called “acceleration and retardation” in evolution, terms that Darwin found opaque, Morse judged to be plain natural selection (F. Darwin, 1888).

⁶³ Morse, 1902b, I, p, 13. By 1900 August Weismann’s germplasm theory had convinced many biologists that inherited traits could not be acquired by environmental effects.

⁶⁴ Morse 1871b.

⁶⁵ Morse, 1925.

⁶⁶ Since Japanese were familiar with simians (snow monkeys), unlike most Euro-Americans, they had long known that monkeys are like people in behavior and general appearance (Naohide, 1990). Interestingly, the first Darwin book to be translated into Japanese was *The Descent of Man*, in 1881. Although parts of the *Origin of Species* were translated into Japanese before 1896, the complete *Origin* appeared in Japanese translation only in that year (Shimao, 1981).

⁶⁷ Morse, 1892.

⁶⁸ In subscribing to progressive evolution in the human lineage, he rated Europeans higher than Africans and other groups (Morse, 1876a).

⁶⁹ According to Naohide, 1990, Morse’s lectures in Japan did not hint of Social Darwinism except in one instance, when he remarked that a strong fighting instinct is required to prevail both in civilization and in warfare.

⁷⁰ Wayman, 1942; Morse, 1885. Somewhat ironically, he found the Mongolian horse-archers to have the most advanced technique. He saw the techniques as ancient traits that had descended in different cultural groups.

⁷¹ Quoted in Hiroshi Unoura, 1991, as being on p. 342 in a chapter by Morse, *Dobutsu Shinkarom* (Evolutionary theory of animals), pp. 319-362, in Yoshino, 1930.

⁷² Wallace, 1890.

⁷³ Morse, 1900, p. 9. Morse was much less a social reformer than were some of his contemporaries (Bannister, 1979).

⁷⁴ Wallace, 1870.

⁷⁵ Morse, 1887, p. 2.

⁷⁶ Lowell even went to Asia in 1883 for almost a decade as a result of Morse’s influence. See Lowell, 1888.

⁷⁷ Strauss, 1993; Morse, 1906; Lowell, 1908, 1909. Martian *canali* had been “discovered” by Schiaparelli in 1877. For a contemporary critique of Morse on the subject of Mars, see Anonymous, 1907.

⁷⁸ Anonymous, 1885, p. 303. On Puritans, Morse had this to say: “[For] the Puritans and their immediate descendents, who had but little of the art-spirit to spare, their somber dogmas crushed the little love for art that might have dawned, and rendered intolerably woeful and sepulchral the lives and homes of our ancestors; and when some faint groping for art and adornment here and there appeared, it manifested itself only in wretched

samplers and hideous tomb-stones, with tearful willow or death-bed scenes done in cold steel” (Morse, 1961, p. 152).

⁷⁹ Morse, 1902b, I, p. 13. Robert Green Ingersoll was a famous lawyer, orator, and agnostic (Greenley, 1977). More generally, Morse grasped China’s dislike of foreigners. He wrote, “It is too much to expect of a man that he should treat with more than cold reserve an individual [such as Morse himself] who belongs to an alien race that has systematically robbed his people, filled his land with emissaries who have done their best to break down every sacred belief and cherished superstition and that has defrauded his nation of vast tracts of territory and of enormous indemnities” (Morse, 1902b, V, p. 77). Elsewhere he sympathized with all “...nations and peoples who are passing through profound changes... as a result of their compulsory contact with the vigorous, selfish, and mercantile nature of the West...” (Morse, 1961, pp. *ix-x*).

⁸⁰ Shima, 1981, p. 93.

⁸¹ Morse, 1887, pp. 32-33.

⁸² White, 2003.

⁸³ Thomas Huxley’s dates are 1825-1895.

⁸⁴ Kingsley, 1926, p. 551.

⁸⁵ Morse, 1893, p. 171.

⁸⁶ *Ibid.*

⁸⁷ *Ibid.*

⁸⁸ Morse, 1902b, IV, p. 61.

⁸⁹ However, a cholera epidemic was raging in Kyoto and Osaka in late 1879 when both Morse and Ulysses S. Grant were in Tokyo (Seidensticker, 1983). Morse attended the reception given for Grant in the central Tokyo park and, on the ship going home to San Francisco in 1880, the Morse family saw Grant again. Grant taught the 9-year-old son, John Morse, to play chess on shipboard (Benfey, 2003).

⁹⁰ Morse, 1877-1878.

⁹¹ Benfey, 2003, p. 74.

⁹² Morse, 1881-1882.

⁹³ Anonymous, 1912, p. 158.

⁹⁴ Morse, 1902b, IV, p. 62.

⁹⁵ Government officials and other prominent people attended his public lectures, in which he used the findings of shell evolution from the Omori work to introduce evolutionary theory and used the cultural artifacts from Omori to introduce Japan’s long prehistory to a receptive audience.

⁹⁶ Naohide, 1990. According to Bunkio Matsuki, 1993, Morse asked the director of the Boston City Library to furnish books unneeded there and the director sent over 5000 volumes; in return, Tokyo University sent the Boston Library over 100 Chinese and Japanese medical texts. However, this report contains misstatements and some of its information is unreliable.

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- ⁹⁷ Bunkio Matsuki, 1993.
- ⁹⁸ Bunkio Matsuki, 1993.
- ⁹⁹ Bunkio Matsuki, 1993, p. 172.
- ¹⁰⁰ Anonymous, 1875.
- ¹⁰¹ Morse, 1923, p. 273.
- ¹⁰² Anonymous, 1873; Anonymous, 1874. Morse did part of his research on marine bird limb anatomy at Penikese (Morse, 1880b).
- ¹⁰³ Morse, 1912; Howard, 1935.
- ¹⁰⁴ Jordan, 1892.
- ¹⁰⁵ Anonymous, 1875-1876.
- ¹⁰⁶ Morse, 1923, p. 273.
- ¹⁰⁷ *Ibid.*, p. 274.
- ¹⁰⁸ *Ibid.*, p. 275.
- ¹⁰⁹ Dexter, 1957a.
- ¹¹⁰ Morse, 1883, p. 112. Morse gave ten lectures on zoology and evolution at the school in 1876 (Whitehill, 1949). See also Benson, 1988, pp. 59-60, on rote memorization at the university level in the 1870s.
- ¹¹¹ *Ibid.*
- ¹¹² Morse, 1883, p. 115. See also Orosz, 1990, pp. 238-242, on this view.
- ¹¹³ Morse, 1902a. He also wrote on the influence of art in the school room (Hickman and Fletchko, 1977).
- ¹¹⁴ Morse, 1881.
- ¹¹⁵ Morse, 1881, p. 605.
- ¹¹⁶ Few Japanese at that time thought of reconstructing the past based on empirical evidence. The prevailing lore took Japanese time back only a few centuries; before that only mythic beings existed.
- ¹¹⁷ Bleed, 1986; Morse, 1880a.
- ¹¹⁸ Morse, 1925. Bleed, 1986, p. 65, regarded his Omori site report as one of high quality.
- ¹¹⁹ Benfey, 2003.
- ¹²⁰ Morse, 1878-1879.
- ¹²¹ Johnston, 1884-1885. Indeed, the Wilkes Exploring Expedition had already brought back a so-called cannibal from Fiji in 1841 (Joyce, 2003, p. 145).
- ¹²² Cole, 1947, p. 59. Rogers headed the U. S. Surveying Expedition to the North Pacific Ocean, 1854-1856. Even earlier, in 1801, a Salem ship captain trading in Japan under Dutch charter had collected and given to the forerunner of the Peabody Museum many items of Japanese household wares (Whitehill, 1949).
- ¹²³ He consulted for the British Museum, the Royal Museum in Dresden, and the Freer Gallery (Champion, 1947). Charles Freer became a visitor to Japan and an avid Asian art collector in the 1880s. Morse was also a severe critic of a book on Japanese ceramics authored by a man who had never been to Japan (Morse, 1890).

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- ¹²⁴ Bean, 1995. According to Whitehill, 1949, Morse worked half-time for ten years preparing the catalogue of the Japanese pottery collection in Boston (see Morse, 1901).
- ¹²⁵ Morse, 1917c, 1961. He also wrote *Catalogue of the Morse Collection of Japanese Pottery* (1901) but this was not a “trade” book.
- ¹²⁶ Anonymous, 1885, p. 303.
- ¹²⁷ He admired the severe simplicity of the human shells (i.e., houses) that the Japanese lived in, but not the stuffy, gingerbread dwellings of many Americans filled with bric-a-brac.
- ¹²⁸ Whitehill, 1949.
- ¹²⁹ Wayman, 1942; Naohide, 1990. In contrast, Roy Chapman Andrews high-handedly shipped his Asian expeditions’ rare paleontological finds of the 1920s to the American Museum of Natural History, angering the Chinese and Mongolians (Preston, 1986; Rainger, 1991).
- ¹³⁰ Okakura Kakuzo later became curator of the Asian Department at the Museum of Fine Arts in Boston (Hickman and Fletchko, 1977).
- ¹³¹ Brooks, 1962, p. 109.
- ¹³² Rosenstone, 1984, p. 75, discoursed on this apparent lack.
- ¹³³ Morse, 1871a, p. 58.
- ¹³⁴ Morse, 1902b, I, p. 16.
- ¹³⁵ Ibid.
- ¹³⁶ Ibid.
- ¹³⁷ Fletchko, 1991.
- ¹³⁸ Later in life he became something of a Mark Twain in several of his public writings. In 1917, for instance, he published two amusing essays. One was a burlesque on how businessmen thought they could save some daylight by putting it in a bank, so as to make winter daytime last longer; this would foster greater industry and cut down on winter eyestrain.¹³⁸ The other essay was a fake Baedeker’s guide to the opera. In it, Morse described the function of seating categories in an opera house. The balcony was “a refined place for suburbanites to wait for the [10:51 pm] train” and the parterre boxes were a place where “the repartee begun at dinner should not be dispossessed by the music,” thus providing “an opportunity to be seen and heard, but not to listen (Morse, 1917b, p. 69). Howard (1935, p. 18) related how at a National Academy dinner in New Haven, the bored former president, W. H. Taft, exclaimed upon seeing Morse, “Here comes Morse! Ask him over to tell us one of his fine stories.”
- ¹³⁹ Dall, 1926.
- ¹⁴⁰ Bleed, 1986; Naohide, 1990.
- ¹⁴¹ Thayer, 1985.
- ¹⁴² Morse, 1924, p. 423.

¹⁴³ Even in the 1920s, Kingsley noted, “Our zoologists are specialists and know but little outside their limited fields. Morse was interested in every side of the subject and could talk intelligently on its every aspect” (Kingsley, 1926, p. 555).

¹⁴⁴ See Hickman and Fetchko, 1977, p. *x*.