

DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES
CALIFORNIA INSTITUTE OF TECHNOLOGY

PASADENA, CALIFORNIA 91125

CHAPTER II-2 - EDWARD S. MORSE GROWS UP

Robert A. Rosenstone



HUMANITIES WORKING PAPER 88

© Robert A. Rosenstone June 1983

Abstract

In which teenage Edward S. Morse of Salem, Massachusetts, begins a life-long love affair with shells, leaves home for Boston, studies with Louis Agassiz at the Museum of Comparative Zoology in Cambridge, and becomes the world's leading authority on brachiopods (by proving conclusively that these tiny creatures are not mollusks, but worms), and how these same brachiopods lead him, at the age of thirty-nine, to Japan.

CHAPTER II-2 - EDWARD S. MORSE GROWS UP

Robert A. Rosenstone

Begin with shells. That makes the most sense. They lead to everything else -- a career in science; the years in Japan; those five thousand pieces of pottery hidden in a dimly-lit attic of the Boston Museum of Fine Arts; that enormous collection of folk art and crafts owned by the Peabody Museum in Salem; this very chapter. Shells fill the earliest entries in the diary of teenage Edward S. Morse. Six decades later they can still be the chief topic of a letter to friends or the subject of an article for a magazine. By then, his reputation as an expert on Japan far surpassed his fame as a scientist, but something in Morse never let go of shells. It was as if life made sense only in terms of shells, as if this first and most enduring passion was a model for all later passions, as if collecting, studying and classifying the remains of small, inarticulate creatures was a way of giving voice to the voiceless, as if by understanding shells he could understand everything, including his place in the universe.

Not that Morse could ever express such thoughts. He was not self-reflective, but a man whose prose, like his mind, tended towards the tangible. Easy it is to see him as a stereotype -- the quintessential Yankee, self-made, practical, down-to-earth, instinctively democratic, with little interest in the artistic, the historical, the literary, or

the philosophic. Few flights of imagination ever disturbed his consciousness or interfered with a single-minded pursuit of accuracy in the realm of natural science. Morse was content to believe in what he could see, touch, smell, dissect and sketch. The surfaces of the world were his reality. Sea shells, bird wings, roof tiles, utensils, latrines, works of art -- all were equally interesting. For him it was easier, more pleasant, to deal with solid objects rather than with people, emotions, ideas, beliefs.

Fifteen years old, a reject from two private high schools, a skinny lad who earns four dollars a week as a draftsman for the Portland Company -- that's Ned Morse of the earliest remaining diaries and letters. It is 1854 and shells are already his major preoccupation. At work he dreams of them; away from work he pursues them. In fine weather or foul, on weekday or even the Lord's day, he wanders along the seashore scanning tidal pools, digs in the clay banks of the Kennebec River, pokes in crevices of stone walls, examines mossy stumps and the undersides of rocks in the woods that edge the capital of Maine. Sometimes he wheels a barrow to the market and returns with it full of fish entrails that may yield rare, deep-sea shells. He haunts the wharves, where American and English sailors are willing to share for a moment those huge, pink and white conches that sound with the roar of far-off seas. He listens to them talk of lustrous, shimmering shells dredged from the coast of Egypt or the mouth of the Amazon, to be sold to collectors in Liverpool, New York, Marseilles.

The romance of such places, the dreams of adventure they inspire in youngsters, never reach the pages of Ned's diary. His desires are more matter-of-fact: he specializes in land shells -- small as the fingernail of a teenage boy, homely by any standards -- that bring nothing from stores or dealers. But neither beauty nor money are his object. Satisfaction comes from the process of studying shells through a three dollar microscope, drawing them, sorting them into groups, arranging them neatly in the drawers of his cabinet. The goal is a complete collection of Maine shells; his fondest wish, to discover a new species. This happens for the first time when Ned is nineteen. Part of the shell of an earth-colored land snail, one thirty-second of an inch in length, goes off to the Boston Society of Natural History, where the region's foremost conchologist proclaims it "a distinct species . . . the most minute of any yet observed." The official proceedings term it "Helix asteriscus, Morse." A year later another new species bears the name "Tympanis morsei."

Sweet recognition to a lad with scientific ambitions, but just another source of discord with father. Jonathan Kimball Morse, deacon of the Baptist Church, partner in a company that deals beaver furs and buffalo robes, is a man who sees no profit in shells. They interfere with everything important -- school, work, church. His son is too irresponsible, self-centered. Ned has been thrown out of schools for talking back to headmasters. He picks quarrels with his boss at the Portland Company, has quit or been fired more than once, and only is rehired because his older brother is a company official. Worst of all,

his mortal soul is in danger. On Sundays Ned is likely to claim illness, stay home from church, then spend the day puttering with his cabinet or mooning along the beach. Here is ample cause for the angry eruptions between father and son, the recurrent quarrels over the young man's future that can end with Jonathan intoning prayers and Ned toying idly with the idea of suicide and confiding to his diary, "Must I give up the only things I care to live for and turn to support of this body, gross and low?"

Despair is not a common mood. The pain of conflict with father is eased by the love and support of his mother, Jane Beckett Morse, a woman romantic enough to claim descent from Thomas a`Becket and scientific enough to win recognition from the Portland Society of Natural History for cross-breeding flowers and assembling a comprehensive collection of local plant life. The clearest tribute to her influence comes from Ned. At the age of twenty-two, he describes her in a letter as an "accomplished lady" who has studied Greek, Latin, German, French and Spanish, who understands Conchology and Botany, and who can "skate, dance, ride a horse, a locomotive and forty other hobbies." She also is a hell of a cook. Roast turkey, baked beans and, above all, fresh donuts -- his lifelong taste for these dishes begins in mother's kitchen.

An interest in science is not the only legacy from Jane; she also passes on to Ned her sunny temperament. Jonathan Morse may relish an orthodox world of hellfire and damnation, sin and punishment, but his wife has turned her back on such painful doctrines. She dabbles in

Spiritualism, hoping to communicate with the shade of her deceased, first-born son. Ned accompanies her to seances and meetings, devours tracts, argues the topic with friends, labels nonbelievers "darn fools," and once is deeply moved to hear the voice of Edgar Allan Poe, through a medium, urge the audience on to higher moral values. At seventeen, he sets up an experiment to see if his own "Guardian Spirit" can accurately transmit information from a friend in another town. Failure does not destroy his belief, and with good reason.

Spiritualism provides an alternate world view to the oppressive, gloomy doctrines of his father's church; it posits a universe open to study, brimming with sweetness and hope, and governed by a Supreme Being much to Morse's taste: "God teaches us to smile. Nature, the flowers are all smiling and beautiful."

Were Morse himself narrating this story, he would agree with the sequence: shells first, parents second. But any impulse of the biographer to put siblings third would not be his. So rare is any mention of his older brother or three younger sisters that to read his journals could be to take him for an only child. Yet almost any page will tell you he has a close friend named John Gould. Together they are students at the Bridgton Academy in 1854. When Morse is sent home for carving school desks with a penknife, a correspondence that would last for seven decades gets under way. Shells are the basis of the relationship, the chief topic of their letters in the early years. At least once a week, they exchange information about new finds, share drawings and details and notions of classification gained from books on

natural science. That Morse is the more single-minded of the two begins to show in 1856 when John returns to Portland and goes to work in a bank. What a perfect profession for a friend! For the remainder of life, Ned will shamelessly borrow money from John -- to live in Cambridge, to finance scientific ventures, to go to Japan. Gould's reward will be an unceasing flood of letters that detail Morse's scientific accomplishments and financial woes.

Friendship is one part of a larger social world. An obsession with shells does not interfere with teenage years full of the activities of any typical, small-town New England youngster in the forties and fifties. You may see them as a series of old watercolors -- boys and girls with red cheeks on a berrying party in the woods; young men in a sailboat heeled against gray swells, beating towards a coastal island; heaps of youngsters in wool coats, hats and blankets, overflowing a horse drawn sleigh in a landscape of snowy fields. Ned learns to bang tunes on an upright piano, enjoys a good game of whist; dances the cotillion at sociables; flirts with young ladies; proposes to a girl named Lutie, is gently rejected and decides, "I will be a brother to her." He acquires a taste for beer, wine, cigars and a pipe, regularly vows to give each up and just as regularly breaks those vows.

The age of twenty finds him part of a circle of "free thinkers and Deists" who share meals, wine and conversation unhindered by "stiffnecked orthodoxy." Ned has a niche in Portland, but he is also restless, moody, full of desires for things not easily defined. He

wants to leave a job that drains his energy into drawings of locomotives, machinery, bridges. He wants to be on his own, to spend full time on shells. Yes, he is something of a local luminary -- secretary of the local Society of Natural History, receiver of visits from scientists whose books have been published in Boston or New York. They solicit his opinions on local fauna, praise his cabinet, admire his drawings, occasionally ask him to go on expeditions. All this has an effect. No single act leads to the decision, but one day it has to enter Morse's consciousness that his home town, more than simply provincial, is dreadfully limited and limiting for anyone with yearnings toward a career in science.

To Portland eyes and ears, Boston -- with a population of fifty thousand in 1858 -- is congested, noisy and expensive: four dollars a week for room and board. Part of that covers the first indoor plumbing Ned has ever seen -- a toilet, "which saves the travelling down two or three flights of stairs and the inconvenience of being half frozen in the attempt," and a tub that brings forth a solemn pledge: "I intend taking a bath every week." The main attraction of the city is not the plumbing; nor the job as designer and draftsman with Bricher and Russell, Engravers on Wood; nor the Parker House where young men splurge on "claret, ale, oysters, charlotte russe"; nor the theater where you can see "Our American Cousin" seven years before Abraham Lincoln and John Wilkes Booth come into brief contact at a performance; nor the Everett Gallery, where the latest Albert Bierstadt landscape is

on sale for eight hundred dollars; nor the "most magnificent" public library, where pillars, dome ceiling, marble floors cause Morse to gape around for half an hour. No, for him the heart of the city is the Boston Society of Natural History. Late in October he is elected a "corresponding member," and the rooms, the library, the collections of botanical, zoological and geological specimens all become open to him.

The Society is a mirror of pre-Civil War American science, one that reflects the drastic decline in basic research since the days when Benjamin Franklin was elected to the French Academy. A foreign observer like Alexis de Tocqueville blames this on egalitarianism, which emphasize the need for quick results. Only an aristocracy enjoys enough free time to nurture that rare passion for "profound knowledge." The Frenchman may have had a point. In the first half of the nineteenth century, Americans excelled only in that most democratic of fields, natural science. The case of Morse is not unusual. He has never completed a secondary education; his knowledge of technique and theory derive from a few books bought or borrowed, from meetings with equally amateurish local investigators, and scraps gleaned from visitors with more formal training. Yet Ned is bright, energetic, tireless, and his eye and mind are keen. These are the qualities necessary to seek out and classify the dimly-known plant animal life of the continent.

Hints of change are in the air when Morse begins to attend semiweekly meetings. Amateurs mix with professionals as they always have, but there is a sense that science is growing, becoming more

serious and grandiose in its aims. A good part of this stems from the presence of Louis Agassiz, who, a decade before, abandoned a major research center in Switzerland to take the first chair in Geology and Zoology at Harvard's new Lawrence Scientific School. The world-renowned scientist sees the United States as a land of opportunity. He is a superb promoter, one who uses popular lectures, publications and personal magnetism to convince New England's elite of wealth that scientific research is worthy of support. The late fifties see him at the peak of his influence. Backed by wealthy industrialists and the State of Massachusetts, Agassiz is constructing the world's largest Museum of Comparative Zoology.

Just one year after leaving home, Morse joins a dozen young men who eagerly begin to work in the still half-completed building in Cambridge. Compensation for Agassiz's first assistants is small: thirty dollars a month plus free room and board. But the real reward is educational -- all are students at the new Museum School. Alone of the group, Ned lacks a college background. Acutely aware of his "superficial knowledge," he drops the casual patterns of earlier school days. The first year he takes careful notes at more than one hundred lectures on zoology, paleontology, ichthyology, embryology and comparative anatomy, and supplements these with a home reading program that ranges beyond science to include French and German. In the Museum, Agassiz is quick to recognize his talents and expertise. On the first day of 1860, this note in his diary: "Prof has given me the most unlimited control over Shells in the Museum."

This is a major task. Mollusks -- to give shelled creatures the proper scientific label -- then considered to be one of the four great divisions of the animal kingdom, are one of the four main sections of Museum. In the first year alone, Ned is responsible for studying, arranging, classifying, cataloguing and bottling thirty thousand specimens that belong to four thousand species. The chief scientific problem is this: relationships between families of mollusks are poorly known, and Agassiz's guidelines tend to be artificial, arbitrary, even vague. Morse notes: "Family is form determined by structure. Genus depends upon the ultimate details of structure. Species . . . (on) ornamentation, distribution, form." To determine proper categories is a matter of endless study and the delicate dissection of soft, miniscule bodies. Hours, sometimes days can be spent in a search for the lingual ribbon (tongue) or anus or reproductive organs of a creature so tiny it must be viewed under a microscope, but the results can be worth all the labor. More than once Morse finds that a genus should really be a family, or that a single species can be subdivided into several. Difficult, exacting, tedious -- his work is all of these, but unlike labor over his Portland cabinet, this is part of a professional career.

Mollusks are not the full sum of Ned's duties at the Museum. Student assistants are valued for brawn as well as brain. They haul, lift and unpack the barrels, boxes, kegs, cans and crates that pour in almost daily from Agassiz's buying trips, expeditions and contacts around the world. Here are fossils and creatures living and dead from

the American West Coast, Brazil, Australia and Africa. "Prof" -- for so Agassiz is always called -- works with them, jolly as a birthday child pulling forth presents, or in this case rare varieties of fish, turtles, crabs, birds, mammals large as deer and moose. Some familiar items end up on the students' dining table; others seem mysterious, difficult to identify. Morse, once finding something which looks like an animal without its shell, studies the specimen seriously for quite some time before recognizing it as a stray leaf. To quell the ensuing amusement, Agassiz exclaims, "You need not laugh, gentlemen, for I, not long ago, puzzled over a pair of old breeches for two hours."

Prof is like that, and the students love him. His influence extends far beyond zoological matters. He can be informal, chatty, full of stories about the great men he has known -- Georges Cuvier, Dominique Francois Arago, Alexander von Humboldt. He speaks of science not as a profession, but a sacred calling, a way of life that demands sacrifice. Young men must be dedicated, ready to forego economic gain in the pursuit of knowledge. But they also must avoid being too narrow and single-minded. The study of history, literature and philosophy, the reading of Shakespeare in order to learn to "write classically" -- such things are important for a "cultivated" person. So is a well-rounded social life. He warns against any tendencies toward misanthropy, urges them to associate with all kinds of well-bred people -- even those ignorant of science -- and to seek especially the company of "intelligent and refined women."

Mentor, companion, hero, role-model -- to his assistants, Agassiz is all of these. For Morse, Prof has another, deeper, meaning: he is the ideal male parent that has been missing at home. The journals and letters brim with adulation -- "There is no better man in the world" -- and with references to him as "a Father," the noun always capitalized. When he is sharp with Ned -- "Prof spoke to me about the manner I had of jumping from one thing to another" -- the young man vows to do better. He even attempts to follow Agassiz into the realm of culture. Shakespeare seems beyond him, but Morse makes a stab at Dickens, learns to enjoy the opera, and attends an occasional art exhibition. Little surprise that his taste runs to landscapes, or that he will judge a work as a masterpiece because the artist draws with the fidelity of "a close student of nature" and renders perspective so well "that one can guess the distance of any object."

Such an opinion reveals much about Morse's relation to the world: everything is judged through the eyes of natural science. Into this sphere alone goes all his sense of wonder, his desire for answers. Elsewhere his mind is conventional, limited. Never has he been moved to read a book of history, philosophy, or political economy; never has he studied the civilization of Greece or Rome, or the Middle Ages, or France at the time of Louis the Fourteenth. He dwells in Cambridge in 1859, but his detailed journal remains innocent of words like "Abolitionist," or "Transcendentalist," and his eyes have never encountered the writings of those nearby residents who have been so active in creating American letters and thought -- Ralph Waldo Emerson,

Henry David Thoreau, Bronson Alcott, Nathaniel Hawthorne, Henry Wadsworth Longfellow, Oliver Wendell Holmes. For Ned, a political opinion is to call Great Britain "the most stupid conceited nation on this earth"; a literary one is to rate Richard Henry Dana's Two Years Before the Mast a "good thing." Under Agassiz's supervision, he can become a scientist, but even Prof cannot make up for his barren background or limited horizons. No doubt about it -- Morse is a victim of cultural poverty, a man cut off from the high Western tradition in humanities, literature and the arts.

A magic time. Freshness, excitement, group spirit, camaraderie, the contagious joy of working towards a common goal. That's the first phase at the Museum. It lasts a year, perhaps a few months more, but however long, such a period must draw to a close. Just as Agassiz's luster must begin to dim. This is America, the land of opportunity, the land that boasts of individualism. Here there is only so much to be learned from fathers and surrogate fathers. Ideas change, techniques alter, new theories are formulated. Age and experience must inevitably make way for the new. The young and ambitious can remain content to be assistants for only so long. Wisdom -- that is the cost of progress, the casualty in this battle which pits the young against their elders.

Discontent with Prof is triggered by an intellectual conflict, one that begins to undermine his position in the nation's scientific community. The issue is evolution; the initial battleground the Boston

Society of Natural History. Morse is a noncombatant, but the struggle will affect the course of his life, lead to his major scientific accomplishments, and eventually take him to Japan. Skirmishes over this most important scientific theory of the century have begun before Ned's arrival in Cambridge when, at BSNH meetings in the Spring of 1859, Harvard Botanist Asa Gray clashed with Agassiz over the idea of the development of species. In November, a copy of The Origin of Species arrives directly from its author, Charles Darwin, and the battle is fully under way. The book's theory contradicts Prof's most fundamental beliefs. As the son of a minister, Agassiz knows that species are fixed and immutable, an affirmation of God's coherent plan for the universe. Nothing Darwin can say, no masses of evidence, no arguments, however logical or coherent, can be strong enough to change his mind.

Debates at BSNH meetings in early 1860 are sharp and acrimonious as Ned and his comrades watch Prof struggle with the proponents of evolution. At times, Agassiz can be magnificent, almost awesome in his vast knowledge of geology, paleontology, zoology. But the bedrock of his arguments is an unshakeable faith in the discontinuity between epochs, a belief that there is no relationship whatsoever between fossil species and living ones. To bolster this position, he gives a special assignment to Morse: "There are thousands of species of shells found fossil in England and France which authors consider the same as recent living species. Prof. don't believe they are the same and he wishes me to examine closely and make comparisons of those species in

order to prove their difference." Sometime later Ned will begin to call these shells by their proper names -- brachiopods.

Prof's resistance to evolution is shared by many scientists. The real issue at stake is open-mindedness. By refusing seriously to consider the evidence for Darwin's assertions, by holding to an a priori set of assumptions and insisting that any resemblance between fossils and living species only proves that after each Ice Age destroyed much of the world's animate life, the Almighty stepped in to recreate some of the same species, Agassiz begins to tarnish his reputation. Others return to laboratory studies to see how closely life forms match the Darwinian model, and their assent to evolution may come years later. Morse himself takes such a path. Like Agassiz, he initially objects to Darwin from a viewpoint vaguely theological. "Don't you see," he writes to Gould, "that if his theory is true it would leave one without a God? . . . for the origin of species according to his idea would be simply chance and nothing else." More unusual -- unique perhaps -- is the denunciation of evolution as too much like the determinism of his father's orthodoxy: "Darwin's struggle for existence smacks too strongly of Calvinism . . . (his) picture look a good deal like Calvin's drawing of us poor worms."

A mind shut against Darwin proves closed to other viewpoints as well. The loving father can also be autocratic, harsh, unjust. No doubt this is true from the beginning, but only in the Fall of 1860 does Morse drop the idealization and begin to criticize Agassiz. Yes, he is a "great man," but several angry, unfair tirades against students --

set down to his "foreign temper" -- make it clear that this applies only to the realm of science. And here, too, doubts can surface. Annoying it is to find second year lectures often to be word-for-word repetitions of those already delivered. Some classes are far worse: "Stupid lecture this afternoon from Prof. I went to sleep." Towards the end of the second year at the Museum, Ned is capable of wholly dismissing Agassiz's public presentations at the Lowell Institute: "He regarded cats and dogs as belonging to the same family. Walked out."

Three months later, in January, 1862, Morse is back in Portland, set up in a new career as a Zoological Draughtsman. Disillusionment with Prof is not the only reason for the break. The world has become a different place. National developments and personal ones overlap, intertwine, make imperative the need to be independent. Jonathan Morse has died, unreconciled to his son's ways. Lincoln has been elected President, the South has seceded from the Union, the guns have fired on Fort Sumter, the troops have marched into battle at Bull Run. Ned despairs at not being in uniform, but the fault is not his. The first call to arms in April, 1861, sends him rushing home to enlist in a Maine regiment, only to encounter an opposition too strong to overcome -- mother. Pages for the crucial two weeks are later cut from the diary, but Jane Morse's arguments are not difficult to hear: she is a widow of little means; she has three daughters to support; brother Fred is already doing all he can. Defeat on the home front only serves to increase Ned's jealousy as he watches friends like John Gould don smart uniforms, parade through the streets, board trains for the journey to

war. No way around it -- being a man has something to do with shouldering arms for one's country, and here he is at twenty-three, still a boy, a student, and assistant at a meager salary that can barely support one person. This is the added complication, another reason to leave the museum. By the close of 1861, Morse is ready to undertake another sort of manly act -- he is preparing to marry.

Love has taken him unawares. Ned has always enjoyed the company of women at dances, sociables and group excursions, but the early rejection by Lutie has made him certain that he will always remain "and old batchelor [sic]." His real desire is for "an honest female friend," a kind of sister, and one appears at a dance during his trip home to Portland in February, 1860. Her name is Nellie Owen. She attends church regularly, suffers from severe headaches, and keeps a diary that chronicles a life so uneventful that the daily weather report provides most of its drama. None of this prevents friendship from ripening into love. In June they embrace for the first time; by October Ned informs his mother, "Nellie is just like you;" during the following months he regularly confesses that he "cannot do anything but think of the moment that I shall clasp her in my arms again." The question of whether he is worthy enough nags at him, but after the engagement at the end of the year, it is answered with a solemn resolve: "She is the one to whom I will look for advice, one who will lead me to a higher scale of thought, and one I shall love to please by my good behavior." From now on his joy will be to strive for her happiness.

Easier to say than do. Yes, he does occasionally attend church with her, "irksome" though it proves to be. And when Nellie asks him to forsake tobacco for health reasons, Morse makes a brief effort to comply, even while confiding to his journal that she is "ignerant [sic] regarding the effects of the use of it." For a few weeks he attempts to share his usual passion, hauling her off to the Zoology Museum in Cambridge for lectures on the animal kingdom and methods of classification, but Nellie proves to be more interested in Morse than in mollusks. Not until June, 1863, can they afford to marry. Their diaries for that thirty month period record -- behind a chaste, restrained vocabulary -- all the emotions of love in any age: desire, yearning, concern, doubts, caring, regret for an ill-spoken phrase, resolves to be more careful with the other's feelings. Yet on the eve of the marriage, Ned takes a step peculiarly his own -- he asks John Gould to join them on a "marriage tour" that will consist of a snail-collecting trip: "What a delightful time we should have!" His friend cannot accept, but the invitation may be seen as a symbolic key to the marriage. Collecting, science, career -- these will always take precedence over home and family. Nellie is a good wife: for forty-seven years she silently takes care of the household, raises the children, and stays out of the way so that Ned can get work done. Her headaches continue and can be especially severe on Sundays, birthdays and anniversaries. On his many extended jaunts away from home, Morse will -- with a single exception -- always leave Nellie behind.

Fifteen years of slow but steadily growing success follow the departure from Cambridge. Prof's training has turned the amateur into a professional, but talent, dedication and hard work are necessary to create a career. By the seventies, Morse has earned a widespread reputation for scientific activities both professional and popular -- as researcher, Curator of Mollusks at the recently established Peabody Museum in Salem, founding editor of The American Naturalist, lyceum lecturer on natural history, visiting faculty member at Harvard College, and writer for journals, magazines and newspapers. Endeavors like these serve to bring a variety of honors. Bowdoin College confers a doctorate; the American Academy of Arts and Sciences and the American Association for the Advancement of Science both elect him to membership; he is asked to deliver the Lowell Lectures in Boston; a new normal school in New York City offers a Chair; Asa Gray recommends him in 1872 to the President of Princeton as "just the man" to start a new school of natural history.

Most of his income derives from the popular side of his career. A witty, energetic speaker who possesses the rare ability to sketch rapidly on a blackboard with both hands at the same time, Morse becomes a favorite with post-Civil War audiences that do not sharply distinguish between education and entertainment. On annual swings through the East and Middle West he lectures on insects and animals, shelled creatures of the land and sea, ancient glaciers, flowers and their friends. Livelihood may be the major payoff of such popular activities, but they also represent a tacit expression of faith in the

educational potential of ordinary people, a kind of reaffirmation of his own humble beginnings. The same attitude fills his publications. Newspaper articles by Ned encourage readers to enhance the pleasure of mountain and seashore trips by observing and learning more about the world of nature. The American Naturalist, one of the first popular journals of science, is designed for the "practical advantage as well as . . . the intellectual and moral elevation . . . (of) the philosopher and the day laborer." His First Book of Zoology avoids elaborate tables of classification, latinate words, and complicated theory to focus on the homely, urging students to seek the animal kingdom in the snails, worms and frogs of their own backyards.

Morse's own investigations retain a similar flavor. Other researchers may begin to specialize in embryology or comparative anatomy, adopt new vocabularies and move towards the experimental laboratory, but he sticks with "natural science" into the seventies and never loses a taste for the outdoor pleasures of collecting in forest, field, river and sea. No surprise that his major discovery grows out of shells. For more than a decade he tracks those brachiopods -- to which Agassiz first directed him -- on expeditions that take him up and down the Eastern seaboard, north to the St. Lawrence River and south to the Carolinas. Study of specimens at his home in Salem begins to indicate that brachiopods have been incorrectly classified. Long have they been considered mollusks because, like clams and oysters, they are bivalves with two shells. But the resemblance is not a true one, for the valves of a mollusk are left and right, while those of a brachiopod

prove to be dorsal and ventral, or front and back. Such a finding is not conclusive, and the study must continue for years with detailed examinations of the internal organs -- liver, stomach, ovaries -- of creatures only one-eighth of an inch in length. By 1870 the results are ready: The Brachiopoda: A Division of Annelida proves conclusively that they are not mollusks, but worms.

Let the trumpets blow and banners unfurl to the wind. More than a century later this discovery may seem a trifle tame, routine, even pedestrian. But in nineteenth century natural history, nothing is more important than accurate classification. No wonder that Morse's findings thrust him to the pinnacle of a career, let him bask in a kind of glory while praise pours in from scientists across the United States and Europe. Most delicious is the letter from Charles Darwin that commends the strength and clarity of the presentation: "What a wonderful change it is to an old naturalist to have to look on these 'shells' as 'worms.'" Words like this can seem ample repayment for all the years of tedious study; they underlie Ned's own shout of triumph in a letter to John Gould: "It isn't every day that a prominent class of animals is walked out of one branch and into another."

Brachiopods do more than bring an international reputation; they also help to turn Morse into a follower of Darwin. His public endorsement of evolution comes in 1873 at a meeting of the Essex Institute in Salem. By then, the issue is becoming a touchy one in religious circles, and being too outspoken may endanger Ned's career as a lecturer. At least that is the opinion of Gould, who may be growing

a trifle weary of lending money to help support his friend. But to the suggestion that he tone down future statements, Ned has a sharp reply: "I should rather come down to one meal a day and lumber along in debt" -- one can almost hear Gould sighing -- "than to follow so humiliating a path." Truth is truth. The public is ignorant of Darwinism and it is his duty to spread enlightenment. His changed view of evolution is hardly precipitous, but only the mark of a careful scientific mentality: "My chief care must be to avoid that 'rigidity of mind' that prevents one from remodeling his opinions; there is nothing (more) glorious . . . than the graceful abandoning of one's position if it be false. . . ."

This admirable attitude extends no farther than the realm of science. However open his mind, Ned in his late thirties remains uncurious about, and wholly uncritical of, the social, political and artistic premises and practices of his nation and culture. Over the years his beliefs have been remarkably consistent. He is a scientist and an American; he believes honesty is the best policy, and that the early bird gets the worm. Evolution may provide a new way of rejecting the church of his father and those distasteful doctrines like Original Sin or eternal punishment in an afterlife, but it does nothing to affect a faith -- shared by Darwin -- in the "wisdom and goodness of the creator." Nor does it free Morse from the values and habits of a culture rooted in the Puritan tradition. Work is his life, his pleasure, his duty, his reason for being. It is what justifies man's ways to man.

How distressing, then, to feel that one's important work is done. After the paper on brachiopods, after the fame that derives from this culmination of a life devoted to shells, Morse the researcher has lost direction and purpose. Mollusks no longer tug as strongly at him. In the mid-seventies, complaints to friends that the field has become routine lead to threats to abandon shells because nothing more can be done "aside from describing new species." Surely this is an odd assertion for a man whose life has been devoted to just such activities! Were Morse self-conscious, he might find in such a remark an indication of some serious psychic alterations in process. Had he the benefit of late twentieth century psychological insight, he might see himself as beginning a slide into a midlife crisis. Barring such insight and foresight, he is left with the daily routine of a life that seems less satisfying than ever before -- overseeing the shells at the Peabody Museum, preparing and delivering lectures, attending scientific gatherings, writing articles and papers.

The way out comes -- no surprise here -- through shells. A lecture tour in 1874 takes Morse to California for the first time, where San Francisco provides not only a bay, hills and the flavor of Chinese culture, but a most important chance contact. Someone with a taste for natural history and a knowledge of East Asia informs Ned that the waters of Japan are loaded with brachiopods, perhaps as many as forty species unknown in the United States. The response is predictable and immediate -- he must go there to continue his old studies in a new setting. For the next three years, Morse will work to

arrange free time and raise the necessary money for the expedition. What he cannot earn, he will, of course, borrow. For Ned -- or his closest friend John -- no price is ever too high nor any distance too great when it is a matter of learning more about creatures who live in shells.