Benjamin Silliman (1779–1864). Portrait by Samuel F. B. Morse, 1825.

Benjamin Silliman and the Peabody Museum

Barbara L. Narendra

Benjamin Silliman was born 200 years ago, on 8 August 1779. His influence on the development of science not only at Yale but in this country as a whole was so great that this year the University is celebrating the memory of one of her most illustrious sons with lectures, publications, and exhibits.

Although Silliman died two years before the Peabody Museum was even founded, and twelve years before its first building was completed, the Museum would not have come into existence without his work in building up Yale's collections in mineralogy and geology, his pioneering teaching of chemistry, mineralogy, and geology, and the resultant preeminence of Yale in 19th-century scientific education.

To begin with, some share of the credit for Silliman's great accomplishments should be given to Yale President Timothy Dwight the Elder, who decided upon Benjamin Silliman as his choice to fill the college's new professorship of "chymistry" and natural history. In 1798, aware that Yale was behind the times (many American colleges already had professorships in these subjects), Dwight had persuaded the Yale Corporation to approve the position, to be filled as soon as funds should become available to support a salary. In spite of Dwight's mighty intellect and his unusually progressive regard for science, this was a remarkable step for an ultra-conservative president of a conservative seminary devoted to turning out worthy members of the Congregational clergy. His designation of Silliman was seemingly even more remarkable, since Silliman knew next to nothing about chemistry, and, as a matter of fact, was studying law at the time (while working as a Yale tutor to support himself). But President Dwight had already had a taste of political incompatibility with a faculty member (whom he encouraged to take a post at another college) and did not wish to take the chance of importing a potentially disruptive, though academically qualified, candidate. His only alternative was to choose from within Yale's ranks, and in 1801 he offered the position to Benjamin Silliman (Yale B.A. 1796), son of an old friend and long-time beneficiary of his own paternal attentions, whose politics, religion, and upbringing could be trusted.

Silliman was stunned by the proposal, but after some reflection he decided to accept it. As Dwight had said, there were already too many lawyers; in this new field he would have a free hand with no competition, and his opportunities were unlimited. But just to be safe, Silliman decided to finish his law studies. Dwight's Federalist abomination of Thomas Jefferson's political ideas was loud and outspoken, and Silliman thought the future of the college itself might be in doubt.

Silliman had been assured of enough time and financial assistance to prepare himself to teach his subject. Dwight apparently made no suggestions, and perhaps had none to give, as to the means by which he was to acquire his knowledge. It did not take long for Silliman to realize that chemistry could not be self-taught from books, and on 26 October 1802, six weeks after his appointment was approved by the Corporation, the twenty-three-year-old professor—the ninth professor in Yale's 101-year history—left for Philadelphia, where American science had flourished since the days of Benjamin Franklin. He spent two winters studying at the Medical College of the University of Pennsylvania, and in his spare time he and chemist Robert Hare performed chemical experiments in a laboratory they set up in a cellar kitchen of their boarding house. With this background, and his conscientiousness, energy, and ambition, Silliman would have become at least a competent instructor in his basic subject, chemistry. However, his appointment included natural history, which in those days was understood to cover geology, mineralogy, botany, and zoology. He tried to make the most of whatever instruction was available in these subjects, but there was no course in geology being taught in Philadelphia, or anywhere else in this country.

A few months after Silliman's return from Philadelphia, he heard that the Yale Corporation had voted $9,000 for a major purchase of books and scientific equipment in England. Demonstrating his characteristic initiative, to be seen again and again, Silliman jumped at this chance (indeed, out of a sickbed, where he lay ill with dysentery), and proposed to Dwight that he should go to England, transact the business himself, and use the agent's commission and his own salary to best advantage in furthering his education. Dwight wholeheartedly approved and confessed that the idea of this opportunity for Silliman had never occurred to him.

Study Abroad

The year—3 May 1805 to 2 May 1806—that Silliman spent in England and Scotland (with a side trip to Holland) was of major importance in his career. As he later said, "Had I remained at home, I should probably never have reached a high standard of attainment in geology, nor given whatever impulse has emanated from New Haven as one of the centres of scientific labor and influence."[1] After seven busy months of studies and sightseeing in England, he spent the next five attending lectures at the University of Edinburgh. Although chemistry was still his major pursuit, he was exposed to a considerable amount of geological teaching. Even in Edinburgh, one of the most important centers in the development of modern geological thought, geology was then being taught only incidentally in the chemistry courses. But Silliman had arrived at Edinburgh at a time when it was geologically a very exciting place to be. From one of his two chemistry teachers he heard the highly speculative but widely influential theory of Abraham Gottlob Werner, of the Freiberg School of Mines, that all rocks had been formed by deposition in water, a primordial ocean. Silliman's other teacher propounded the views of James Hutton that overstressed the role of subterranean heat as a rock-forming agency. The debate was prolonged for years, but Hutton was essentially correct. In addition, his principle of uniformitarianism, arrived at after a lifetime of observation, is basic to modern geology—that the geological processes of the past were the same as those that are operating today.

Silliman emerged from those few years of preparation in, for his purposes, the two best possible locations, with a solid, up-to-date background in theoretical and experimental chemistry, and a practical knowledge of geology, mineralogy, zoology, and medical subjects. While he was in London, he visited botanical gardens, attempting to learn botany on his own, but his efforts were hampered by the lack of a textbook suitable for his own efforts and for those of his prospective students. He decided that there was just so much that was practicable for him to learn and teach, and so he abandoned botany as a systematic study. He did study zoology, but his teaching of it as a subject seems to have been restricted to a few private pupils. Of course, there were many mentions of living and fossil plants and animals in his geology lectures.

Not the least of the benefits to him of those years was the extensive professional and social contact he enjoyed with many of the world's most eminent men of science.

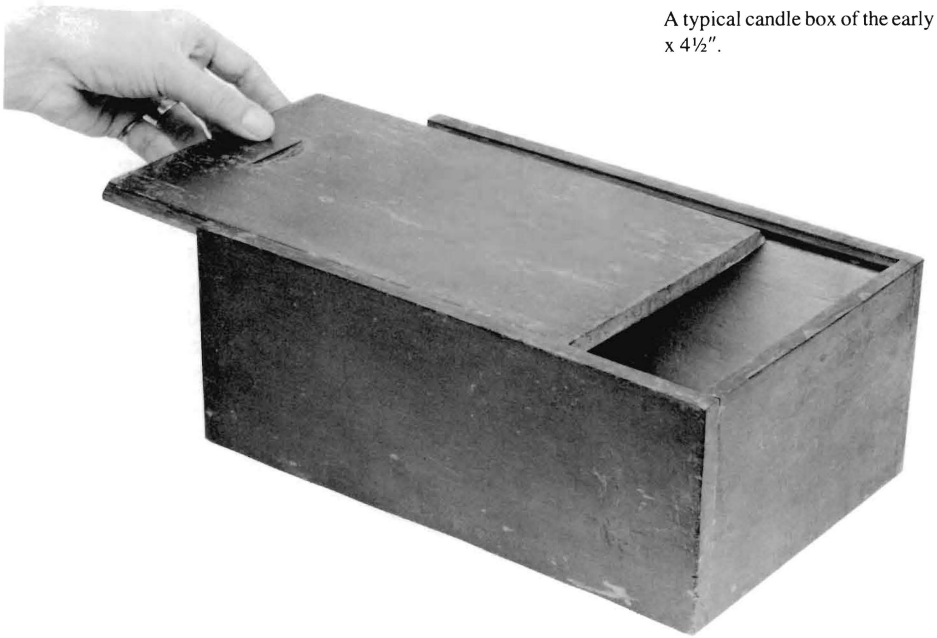
While acquiring knowledge, he was also acquiring the materials he would need—rock and mineral specimens—to teach geology and mineralogy. Only 20 years later, thanks to him, Yale's mineral collection would be the largest and most important in this country. To chronicle its development properly, we must first return to October 1802, and the historic moment at which this story is supposed to begin.

Yale's Earliest Collections

Generations of Yale men knew by heart an anecdote about the beginnings of Yale's museum—Silliman told it to every class, his students passed it on, and it is still being told—how he had carried the college's entire collection of minerals in a candle box (see box) to Philadelphia, so that someone would identify the specimens for him, since there was no one in New Haven who could do it. Well, that is not quite the way it really was. And what about those minerals? Where had they come from?

It is not widely known that Yale had had a museum containing objects of natural history at least as far back as the Revolution.[2] It ultimately grew to be a miscellaneous assortment of hundreds of fascinating things: a bottle of water from the Ganges River, moose antlers weighing 50 pounds, the skin of a 17-foot anaconda, feathered headdresses from the South Sea islands, a chain nine feet long made by a blind man from a single stick of wood, two penguins from the Falkland Islands, wooden shoes from France and China, a poisoned dagger from the Malay coast, a two-headed calf killed in Hamden, and a magnificent cougar's skin, seven feet, three inches long from nose to tip of tail. By 1800 Yale had the more or less respectable start of collections in mineralogy, geology, vertebrate and invertebrate paleontology, botany, zoology, conchology, ichthyology, ornithology, anthropology, and kitsch. Shortly afterwards, a large part of the museum's contents, with all of the wonders just mentioned, was lent to a local entrepreneur and soon forgotten about. After he died, some years later, his property was sold and, along with it, most of Yale's incipient "museum" collection, gone forever. But all was not lost. Among the items kept behind had been at least 200 individual specimens of minerals, rocks, and fossils (including an ammonite eight inches in diameter); a good number of shells; portraits of Elihu Yale, John Davenport, Governor Saltonstall, and George I; and a skeleton known as "the Anatomy."

It was the minerals from this museum that Silliman inherited, and here is one of the rare instances when he



A typical candle box of the early 19th century. Dimensions: 11¼" x 7¼" x 4½".

told his candle box story accurately (at least in print): "The few minerals were generally without labels, and *those that were thought of sufficient importance to be named,* were easily packed in the autumn of 1802 in a small portable box, and carried in the stage to Philadelphia . . ."[3] (italics added). That crucial phrase makes quite a difference.

While he was in Philadelphia, Silliman visited the famous Peale's Museum. It contained the same sorts of things that had been in Yale's museum, though on a very much grander scale. The two cannot really be compared, but it is interesting that Silliman seems not to have commented specifically on the contents of either one. His principal memory of Peale's Museum was of his indignation that one of his instructors, Dr. Benjamin Barton, should have arranged a special showing for his zoology class on a *Sunday*. In his memoirs, Silliman noted with satisfaction that after he stood up in class to state that he would not be able to go —that he had other things to do on Sundays—their visit to the museum was rescheduled.

Candle Box

Candlemaking was a long and tedious annual chore, often handled by an itinerant candlemaker. After candles were made, they were stored by the hundreds in large, sometimes compartmented boxes in a place protected from heat, light, and mice. A few candles intended for immediate use were kept in the kitchen or living room in much smaller containers, and since Silliman himself in various accounts describes his box as "small" or "very small," it must be one of these which he took with him to Philadelphia.

There were two main types of candle boxes. One was a cylinder made of tin or wood, with a hinged lid, meant to be hung horizontally on a wall. The other type was rectangular, made of wood, with a sliding lid. Both were usually about a foot long, four to seven inches wide, and up to five inches high.

Just what a candle box was, what it looked like, and how big it was seem to have been forgotten as oil lamps and gaslight replaced candles as the everyday source of illumination. As the candle-box story was told and retold by writers other than Silliman, this famous box acquired entirely imaginary proportions. No less a figure than James Dwight Dana was apparently the first to give it the capacity of half a bushel. (One can see how that might have come about: Silliman must have told him that the entire collection of the College was a "half bushel of unlabelled stones,"[1] but Dana had also heard Silliman say that all of it had gone to Philadelphia in a candle box.) Its real capacity must have been no more than three or four quarts, whereas a half-bushel is 16 quarts. The box shown here holds 3½ quarts. It would be hard to fit more than a few specimens into a box of this size.

Footnotes

1. James Dwight Dana, Exordium to the introductory lecture on geology, February 18, 1856. In Daniel Coit Gilman, *The Life of James Dwight Dana,* Harper and Brothers Publishers, New York, 1899, pp. 160–162.

Early Acquisitions

Benjamin Silliman and his older brother Gold Selleck Silliman (1777–1868), though two years apart, were Yale classmates and roommates and then law students together. In 1801 Selleck settled in Newport, Rhode Island, to begin his law practice. In Silliman's reminiscences of the following year, an intriguing passage provides the only description I have seen of the first step in the growth of Yale's mineral collection:

> My brother had then recently purchased for Yale College a very small collection of minerals brought out from England by Dr. Senter, who afterwards fell in a duel with John Rutledge at Savannah—'*femina teterrima causa.*'[4] Among them there were some beautiful specimens, particularly in the lime family. They were regarded by me as an interesting acquisition.[5]

A true case of serendipity was the discovery of another account of this incident from a seemingly unlikely source: the Honorable Simeon Baldwin (Yale B.A. 1781), in whose office the Silliman brothers had begun their study of law. While a member of Congress, he wrote a letter to his wife from Washington on 2 February 1804, which confirms and adds to this strange story:

> M^{r} R————who resided last Summer in Wethersfield finds added to all his political rebuffs, a domestic source of more poignant woe.—It seems his wife became attached to a Doc^{r} S————of Newport while they resided there, that this connexion was carried to too great familiarity—that it was then noticed by the friends of M^{r} R. & was by one of them communicated to him; that he had then too much confidence in her Honor to believe the Report—The Doc^{r} has since been in England & lately returned by the way of Charleston & hearing M^{r} R was from home, he went to his plantation & put up—a friend of M^{r} R. informed him what was doing at home—he returned—a Duel succeeded, & R————& his wife have separated—Such are the cursed fruits of unlawful amours—[6]

The two principals in this duel, which took place on 12 January 1804, were John Rutledge, Jr., of South Carolina, and Dr. Horace Gates Senter of Newport. Dr. Senter (born 1780) was mortally wounded, and died a week later. He was noted for his library of 200 volumes, and his taste for the fine arts, being partial to miniature plaster of Paris reproductions of Michelangelo's statues, and engravings of the paintings of Raphael, Titian, and Rubens.

From the first, Silliman lost no opportunity of adding to his collections. In England, two weeks after he arrived he found himself half a mile inside an ancient mine in Derbyshire, breaking off pieces of lead ore with a pickaxe. Another mine not far away provided beautiful crystals of fluorite—the "Blue John" from which were made monumental urns and vases for the great houses of England. A few months later, he descended—holding a candle all the way—400 feet of slippery ladders down a vertical shaft, and then 200 more, halfway into the depths of the famous Dolcoath Mine, the largest in Cornwall. He did not carry trophies of copper from Dolcoath back up: he bought some the next day.

Silliman's collecting zeal once nearly resulted in disaster. Dominating Edinburgh the way East Rock does New Haven is a geological formation called Salisbury Crag, and Silliman observed that the two were very similar. Comparing them, he wrote that Salisbury Crag "has the same rude perpendicular columns, the same curvilinear form, and nearly the same extent: It has a similar sloping mass of ruins accumulated at its foot; it fronts the same way; it slopes off with the same easy declivity in the rear: Like the East Rock, it reposes on a bed of red sand stone; and finally, on fracture, the stone presents the same appearance."[7] Silliman went climbing on it several times in search of interesting minerals. One morning in March 1806 might have been his last. He was edging along right at the foot of the cliff, at the top of the talus (the steep "sloping mass of ruins") when he happened to look up and see a portion of the cliff just beginning to fall, directly above him! Dropping his cane and his specimens, he jumped for protection behind a large fallen column protruding from the talus, and watched as huge rocks bounced by him down the slope. He was just starting back to retrieve his things when

> another mass, which must have weighed twenty tons, broke off from the cliff, and came thundering down with a loud crash, filling the air with flying rocks and fragments and dust, and covering all that tract of the mountain where I had been exploring, and to which I was returning, with ruins and desolation. Had the fall been delayed for only one minute, I should have been in the midst of the space which it swept, and a more brief narrative by some other hand would have related the result.[8]

As soon as Silliman was home, unpacked, and free of college duties, he was off on horseback to try out his new erudition on an inspection of the geological and mineralogical features of the area around New Haven, which had long interested him. On 1 September 1806, three months to the day after his return to New Haven, he delivered a paper on his findings, which he thought was "probably the first of the kind attempted in this State,"[9] to the Connecticut Academy of Arts and Sciences. Distinct progress had been made from the time when, only four years before, "it was a matter of extreme difficulty to obtain, *among ourselves*, even the *names* of the most common stones and minerals; and one might inquire earnestly, and long, before he could find any one to identify even *quartz*, *feldspar*, or *hornblende*, among the simple minerals; or *granite*, *porphyry*, or *trap*, among the rocks."[10]

Not only did Yale have the right man at the right time, it had him at the right place. The New Haven area contains easily accessible rock formations of all three major types: sedimentary, igneous, and metamorphic. Professor Edward Hitchcock (former private student and assistant of Silliman's, afterwards President of Amherst College) wrote, some years later, ". . . had experienced geologists searched the whole of New-England, they could not have found a more eligible situation for a geological and mineralogical school."[11]

Salisbury Crag, Edinburgh. Courtesy of Michael D. Krom.

The Perkins Cabinet

In 1807, Benjamin Silliman convinced Timothy Dwight and the Yale Corporation (not without some grumbling from Treasurer James Hillhouse) to spend $1000 for the purchase of the Perkins Cabinet,[12] of historic importance because it enabled him to give a course in mineralogy. This collection had been put together in England by Benjamin Douglas Perkins (Yale B.A. 1794) with money obtained by decidedly dubious means (see box). Whatever its background, it was one of the two or three best in this country—and the other collections had also been acquired abroad. Mineralogy in America was in its infancy, and, as Silliman wrote in a statement for the Corporation, discovery and development of our as yet unknown mineral resources could be made only by those who had seen specimens of what they should find in the hands of a teacher who had demonstrated that "in their natural state they usually assume such disguises that none but an experienced eye can detect them, even on the surface of the ground . . ."[13]

The Perkins Cabinet consisted of about 2000 well-chosen specimens from England and the Continent, and came with its own heavy mahogany case of drawers. Silliman had it installed in his room in the Lyceum, one of the buildings of the Old Brick Row, where he lived as well as taught. "Soon the news of the arrival of this cabinet was spread abroad, and my chamber was visited by many persons,—ladies and gentlemen. Some were intelligent, and appreciated the cabinet in relation to science, and all were curious to see beautiful things." The visitors included his future father-in-law:

> On one occasion the late Governor of Connecticut, Jonathan Trumbull, Esq., honored the room with a visit, and I had much pleasure in displaying and explaining the specimens. He was very cautious and reserved as to handling them, and when I presented to him the beautiful silky amianthus [asbestos], at the same time handling its delicate threads and offering it to his own fingers, he declined, saying that he would obey the general *noli me tangere* rule of cabinets. I assented, adding, however, that the rule was for the many, but as there was only one governor in the State, the precedent could not be followed, and therefore he might handle. The remark was received with his usual courteous smile of acquiescence. I was then twenty-eight years old, and confess I was not a little gratified that the devotion of five years to my profession at home and abroad had been so far successful.[14]

Up to this point Silliman had only made mention of mineralogical and geological topics at appropriate points in his chemistry lectures, but now, with the combined resources of the Perkins Cabinet and the substantial amount he had so far collected himself, he felt able to give a course of lectures devoted solely to mineralogy. However, this was a private course, for which a charge was made, and was given in his chamber where the collection was kept. Courses in mineralogy and geology were not added to the regular Yale curriculum until 1813.

Tractoration

Dr. Elisha Perkins (1741–1799) of Norwich, Connecticut, was probably America's first big-time medical quack. One of the founders of the Connecticut Medical Society in 1792, he was expelled from it by his disapproving colleagues in 1797 for patenting and promoting his "nostrum." They seem to have been among the few dissenters, for his invention was a huge international success with the public and the medical profession alike.

Capitalizing on widespread popular interest in the new and exciting phenomena of galvanism, Elisha Perkins (of course, after years of trial and effort) devised what he called "metallic tractors." These were a pair of rods about three inches long, rounded and wider at one end and pointed at the other, shaped like tadpoles or horseshoe nails. They were supposedly composed of special metallic alloys — copper-zinc-gold and iron-silver-platinum — but were really only iron and brass, made by Dr. Perkins himself at the cost of one shilling. He sold them for the handsome price of five guineas a pair!

Holding the two rods in contact, thereby initiating mysterious electrical or magnetic effects, one would stroke the pointed ends slowly downward over an area of bodily affliction, in a kind of massage, and the tractors would draw out aches, pains, and inflammations (they were especially good for toothaches and rheumatism). George Washington and his family are said to have been enthusiastic users of them.

In 1795 Benjamin Douglas Perkins went to England to promote his father's invention, where it received even more acclaim. Prominent men founded a "Perkinean Institution" for the benefit of the poor. Against the charge that the tractors cured only imaginary ills, their advocates could point to incredible successes in the treatment of babies and horses, who were presumably free of such worries.

At length the appeal of "tractoration" began to wane (though it was still going strong when Benjamin Silliman was in London in 1805). Having made a reputed profit of £10,000, some of which he spent on a collection of minerals, B. D. Perkins returned to New York in 1803, to become a publisher and seller of books.

The Weston Meteorite

At 6:30 on Monday morning, 14 December 1807, an exciting event took place—the first recorded meteorite fall and subsequent recovery in America—only 25 miles west of New Haven! By Thursday or Friday Silliman had received the news and some pieces of the meteorite, and on Saturday morning he and Professor James Luce Kingsley set out in a chaise for Weston, Connecticut, where a huge fireball had exploded three times, dropping fragments in a 10-mile-long path. Even a meteorite could not tempt Silliman from his usual Sunday routine, and so he did not reach the scene until a full week after the fall. But no matter; after his thorough investigation of the phenomenon was completed he had the beginnings of a meteorite collection, and, with Professor Kingsley, had written a report which was presented to the American Philosophical Society. The importance of this report was later commented upon by Professor George J. Brush: "The diligence employed in obtaining all the facts possible from eye-witnesses of the occurrence, and the care and skill shown in the chemical and mineralogical examination of the meteorite made this paper one of the most remarkable memoirs of the time, and attracted the attention of philosophers throughout the world."[15, 16]

The Gibbs Cabinet

In that busy summer of 1806, after Benjamin Silliman's return from abroad, began the chain of events that was to lead to the acquisition of a most important prize—the Gibbs Cabinet.

Silliman and his mother made a trip to Newport in late July 1806, to visit Selleck and his family. Through a mutual friend, Selleck obtained an introduction for Silliman to Miss Ruth Gibbs, a sister of Colonel George Gibbs. Colonel Gibbs (see box) had come home and gone off to Europe again, leaving behind him, in a Newport warehouse, many boxes of superb mineral specimens. Miss Gibbs allowed Silliman to look through the few boxes that were already open, and this limited peek only whetted his appetite to see more.

After a visit to Newport the following spring, Silliman wrote his mother of his intention to go back and spend the summer and fall there, in peace and quiet, away from the social disruptions of New Haven, and prepare his chemistry lectures for the winter term. Moreover, "As an additional, & very strong inducement, I am to have access to Mr. George Gibb's [sic] extensive & fine collection of minerals—he has just returned from Europe & promises to open his cabinet to me, as freely as I could wish, & to go thro it with me."[17]

The lectures may not have received as much attention as planned. Through their shared interests, Silliman and Gibbs became good friends, and spent many days that summer and fall inspecting the accessible portions of the cabinet, and geologizing all over the island of Newport

Colonel George Gibbs

George Gibbs [Yale M.A. (hon.) 1808], three years Benjamin Silliman's senior, was born into a wealthy Newport family. To introduce him to the family's extensive international shipping trade, his father, "the merchant prince of Newport,"[1] sent him off on a long voyage to China in 1796. Young Gibbs promptly developed a taste for travel and a distaste for business. In the course of several years of "cultivated leisure" in Europe, he studied with the mineralogist Heinrich Struve at Lausanne and at the School of Mines in Paris, and acquired the mineral collections that made up his cabinet. Geologist Amos Eaton later wrote, " Gibbs will always be remembered in this country as the very father of *correct* American Mineralogy. . . . his cabinet first set us all off to work, hunting up our own minerals. Besides his own exertions . . . are unequalled."[2]

In 1804, while on a visit home, he was appointed aide-de-camp by Governor Arthur Fenner of Rhode Island, for which he received the honorary title of Colonel, and as Colonel Gibbs he was known for the rest of his life. In 1810 he married 16-year-old Laura Wolcott (daughter of Oliver Wolcott, Yale B.A. 1778, Washington's Secretary of the Treasury and the third Wolcott to be Governor of Connecticut), and in 1813 he settled as a gentleman farmer on a large estate on Long Island, where he cultivated agriculture with the same enthusiasm he continued to give to mineralogy. He died there at the age of 57. The Gibbses had seven children; George became an expert on American Indian languages, and Oliver Wolcott Gibbs, the foremost American chemist of his time.

George Gibbs (1776–1833). Wearing his colonel's uniform; at about the age when he purchased his mineral collections. Portrait by John Vanderlyn.

Footnotes

1. Charles Schuchert in *Dictionary of American Biography* s.v. "Gibbs, George."
2. Ethel M. McAllister, *Amos Eaton*. University of Pennsylvania Press, 1941, p. 264.

and its vicinity. This was valuable experience for the young professor. In Silliman's reminiscences of a trip they made to Boston, he noted that at that time there was not "much of a spirit of science" there. "Literature was cultivated and flourished." At Harvard, he "saw their small but beautiful collection of minerals. . ." "But mineralogy seems not then to have taken root at Cambridge; and neither mineralogy or geology entered into the plans of education in any of our seminaries."[18]

Silliman still had not seen the full extent of the Gibbs Cabinet; much of it remained crated. By 1810 Colonel Gibbs had moved to Boston, but the cabinet stayed in the Newport warehouse. Gibbs wished to have it set up in a prominent place where it could be useful to science, like Washington, or the new academy at West Point (1802), or Philadelphia, New York, or Cambridge, but in each case the reception of his offer was not satisfactory to him. Finally, as Silliman recalled, "In the winter of 1809–10, Colonel Gibbs, on a journey, called on me in the evening, and, as usual when we met, the conversation turned on the cabinet, and I inquired: 'Have you yet determined where you will open your collection?' To my great surprise he immediately replied: 'I will open it here in Yale College, if you will fit up rooms for its reception.'"[19,20]

There was no suitable space already available in any of the six college buildings, of course. Thinking fast, Silliman proposed to Timothy Dwight, who naturally agreed—he always agreed to Silliman's proposals—that the two northernmost rooms on the second floor of Connecticut Hall be made into one. By removing the partitions between the rooms an area 40 feet by 18 feet was created, lit by the windows at the east and west ends. During the winter, while these alterations were being carried out, and glass cases were being built, the many boxes of minerals were "stored in a room over the Old Chapel."[21] This may have been the very same room which had been the home of Yale's old museum only ten years before!

Connecticut Hall (built 1750–53, still standing). The mineral collection was displayed in the right (north) half of the second floor from 1812 until 1820.

Colonel Gibbs arrived late in the spring of 1811 to supervise the unpacking and arrangement of the collection. "It was a delightful recreation to lift the covers and unrol [sic] the specimens which had been so long secluded from view and when we turned out something very superb we could hardly restrain our admiration."[22] It is quite possible that Colonel Gibbs himself was seeing some of his specimens for the first time, and he probably had not seen any more of them than Silliman had for the last five or six years.

But this was only less than half of Colonel Gibbs's collection. Before having the rest sent on he wanted to make sure that at Yale it would be properly appreciated. And it was. "Nothing had been before seen in this country which could, as regards mineralogy, be compared with this cabinet. It kindled the enthusiasm of the students, and excited the admiration of intelligent strangers." "The liberal proprietor of the cabinet was himself highly gratified, both by the brilliant appearance of the collection, and by the admiration of the country, and especially by that of such men as the Hon. Josiah Quincy, the Hon. Harrison Gray Otis, Hon. Daniel Webster, Col. David Humphreys, and other eminent individuals who were among the visitors. Trains of ladies graced this hall of science; and thus mute and animated nature acted in unison, in making the cabinet a delightful resort."[23]

The rest of the collection—in 50 cartons and three barrels—arrived at Yale in the fall of 1811. More glass cases were built, and the two rooms across the entryway were opened up in the same manner as the first two; half of the entire floor was thereby appropriated for the cabinet. By June of 1812 all was ready and Colonel Gibbs once again had come to New Haven to supervise the arrangement of specimens on shelves. As this was just about to begin, the United States declared war on Great Britain. A hasty decision had to be made: since the cabinet could not be quickly moved to safety in case of attack, would it be prudent to place even more treasures in possible jeopardy?

With little hesitation, the two men concluded to trust in God, and the arrangement proceeded.[24] "The work went on cheerfully, and by midsummer we had occupied the new cases, and the entire circuit presented a rich and beautiful sight. The fame of this cabinet was now blazoned through the land, and attracted increasing numbers of visitors. This collection doubtless exerted its influence upon the public mind in attracting students to the College, and was regarded as a very valuable as well as brilliant acquisition."[25]

The Gibbs Cabinet was composed of two large separate collections and several much smaller ones, all obtained by purchase, as well as a number of specimens collected by Colonel Gibbs himself during his travels.

The first consignment to Yale consisted mainly of the collection of Gigot d'Orcy who was, as Silliman said, "one of the Farmers General under Louis XVI; he was a man of great opulence and fell a victim to the Guillotine during the French Revolution. The forming of his collection occupied him for forty years—and was the result of great expense, numerous travels and an extensive correspondence."[26] "He was an owner in many mines and had access to fine specimens."[27] There were more than 4000 of them, chiefly from France. His catalogue abounds with notations: "beau," "intéressant," "joli," "très agréable," "superbe." "Très joli" was a completely agatized piece of petrified wood from Hungary, polished on a cross-section and showing the bark and annual growth rings distinctly. Silliman remembered that "Col. Gibbs told me that it was regarded as the finest specimen of the kind in Paris. The Empress Josephine had formed a collection & having heard of this specimen sent to Col. Gibbs a request that she might see it but fortunately it was already at Havre having been shipped with the D'Orcy cabinet for America—fortunately for us—To a lady & a queen who could say—Nay! and had it been seen by her it would of course have been admired & must have been presented.[28] Sad to say, it cannot now be found, and has been mentioned here only to give an idea of the quality of Gigot d'Orcy's collection.

Also in this consignment was a smaller, though valuable collection made by another French nobleman, Jacques Louis, Comte de Bournon (1751–1825) who escaped the fate of Gigot d'Orcy by moving to England, where he lived for many years. A noted mineralogist, he performed the mineralogical work that accompanied the most important of the early published analyses of meteorites.[29] In the course of this study he was the first to observe chondrules (small ovoid bodies present in most stony meteorites) and to identify the mineral olivine as a meteoritic constituent. Bournon's own mineral collection had to be abandoned when he left France, but while in England he had the full use of three large collections that he was engaged to arrange systematically, particularly that of Lord Charles Francis Greville, which was later bought for the British Museum for nearly £14,000 by a special grant voted by Parliament.

Among Bournon's numerous published papers is a long one detailing his exhaustive research on the rubies and sapphires of those collections to prove that they were varieties of corundum.[30] Many of the loose crystals he studied were picked out of something one could buy in London called the "sand of Ceylon"—a colorful jumble of red and green tourmalines, blue and reddish-purple zircons, moonstones, spinels of all hues, as well as red (rubies), blue (sapphires), yellow, purple, and green corundum, all found in ancient river-gravel deposits. The collection that Colonel Gibbs bought from the count featured an assemblage of hundreds of spinels and rubies, largely from this source, that was described as one of three complete in existence, in terms of possible colors and crystal forms.

The second shipment brought to Yale the remainder of the Gibbs Cabinet (except for some unidentified pieces Colonel Gibbs wished to keep), and included the largest collection of all—that of Graf, known in Europe as Count, Grigorii Kyrillovitch Razumovskii (died 1837) who, in Silliman's words, "had been *permitted* on account [of] some political cause, to retire from Russia."[31] The count was the son[32] of a former balalaika-playing Cossack from an obscure village in the Ukraine, who had become a very rich man in consequence of his long-time support of Catherine the Great, Empress of all the Russias, and her predecessor, Elizabeth.

Count Razumovskii resided in Europe for many years. He published several books of his geological, mineralogical, and paleontological observations in Switzerland and Austria. He later named two new minerals, and had one named for him (Razoumoffskin, a clay mineral, now an obsolete synonym for allophane). While studying mineralogy in Lausanne, Colonel Gibbs met the count, who had moved there from Paris at the beginning of the French Revolution. Having been "restored to the favor of his Court"[33] (perhaps after the accession of Czar Alexander I in 1801), he sold his mineral collection to Colonel Gibbs before returning home to Russia.

In spite of the size of Count Razumovskii's collection, information about its contents is extremely scanty. Benjamin Silliman could not remember having seen a catalogue of it and he did not make one. There are few contemporary descriptions; one was included in the published notice that announced the Gibbs Cabinet to America (probably written by Colonel Gibbs himself) and it typically is not very helpful: "The collection of the Count Razamowsky [sic] consists chiefly of the minerals of the Russian empire. It is particularly rich in gold and copper ores, chromates of lead, the native iron of Pallas, Beryls, Jaspers, &c. The Russian specimens alone are about six thousand in number. The remainder are chiefly German and Swiss."[34] Naturally, there are now numerous Russian, German, and Swiss specimens in the Peabody Museum's Mineral Collection. Many of them

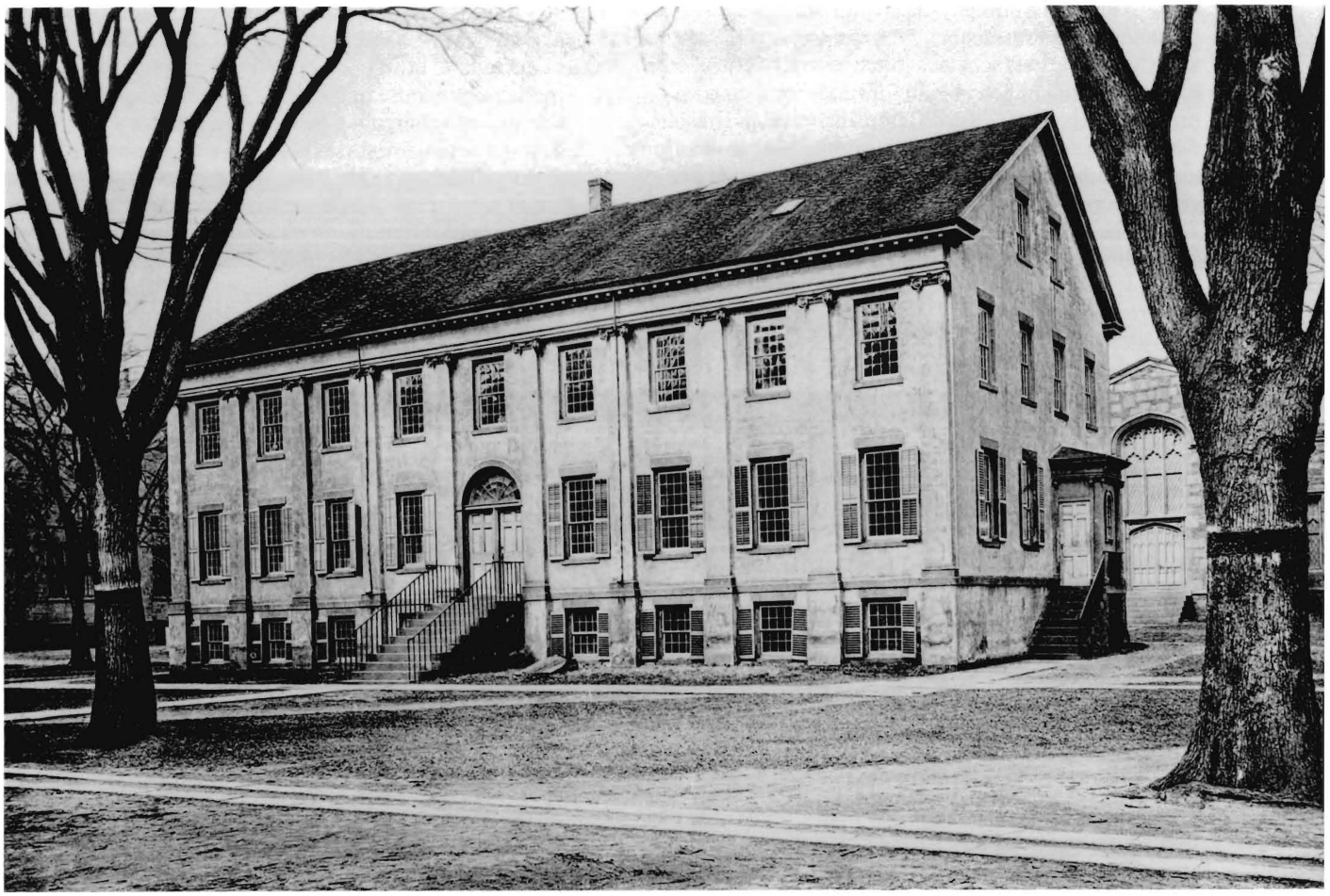
doubtless came with this collection, but without a numbered catalogue, and corresponding numbers permanently marked on the specimens, it is next to impossible now to pinpoint any specimen as having belonged to it . . . with *one* exception: that "native iron of Pallas."

Peter Simon Pallas, a German physician-naturalist, was the leader of a six-year-long scientific exploration of the Russian Empire undertaken by the Russian Academy of Sciences at the behest of the Empress Catherine. In 1772 Pallas was directed to a large stony-iron meteorite (meteorites of this rare type are now called pallasites, after him) in the Siberian town of Krasnoyarsk. At that time its meteoritic nature was not known—it was just a very peculiar-looking ton and a half of iron full of small holes filled with a glassy yellowish substance. (It was this mineral from this meteorite that the Count de Bournon later identified as olivine.) Pallas had it transported to the Academy of Sciences in St. Petersburg. Perhaps it was through his father (a former president of the Academy) that Razumovskii was able to obtain five pieces of the meteorite, each weighing about three pounds. The Peabody Museum's Meteorite Collection today contains one of these specimens and the remains of one other.

By midsummer of 1812 the Gibbs Cabinet was completely installed, and Benjamin Silliman had at his disposal by far the largest and finest collection of minerals this country had ever seen. Yale's superiority in the teaching of geology, unrivaled for many years, dates from this point. The Perkins Cabinet was moved into the beautiful new mineral gallery; tables and seats were installed and Silliman began to give courses in mineralogy and geology as well as chemistry to the undergraduates. (His most eminent auditor was President Timothy Dwight, who attended these classes as he had Silliman's early chemistry lectures.) Dozens of young men—and some not so young—came to New Haven to sit in on Silliman's lectures, to study privately with him, to become his assistants, to examine the Gibbs Collection. Many of them went on to distinguished careers in science, passing Silliman's teaching on to later generations of students in various parts of the country.

In 1819, Silliman heard that a new one-story stone building was about to be built for a college dining hall, and it occurred to him that a second story would not only make the building look better, but would provide more commodious quarters for the mineral collection and his classes. President Dwight had died two years earlier, but his successor, Jeremiah Day, was just as receptive to Silliman's expensive and expansive ideas as Dwight had been, and the second story was accordingly built. Colonel Gibbs assented to having his collection moved, and again came to New Haven, in the summer of 1820, to supervise. "The spectacle was now splendid; a room 84 feet by 40 and nearly 12 feet high presented its walls (the spaces for the windows excepted) entirely covered by cases brilliant with glass and still more brilliant from the effect of the minerals which they contained."[35]

The collection remained in this room for more than half a century, until the first Peabody Museum was ready to receive it. For some years there was a constant worry about the danger of fire from the cooking facilities in the basement and the lamps of the kitchen help who lived in the attic; it was a great relief to Silliman when the college commons was discontinued in 1841. In addition, he was enabled to expand into the attic for storage, as well as into the floor below, where the dining rooms became lecture halls. The gallery was freed of the benches and tables, the dirt and dust brought in by the students—sometimes 200 of them at a time—and something mysterious Silliman called "the American defilement which all my efforts could not correct."[36] The Cabinet Building, as it became known was, then, Yale's museum from 1820 until 1876. It was always accessible to the public; indeed, later on it appeared in the New Haven directories in the lists of "Public Places, &c" along with the Green, the cemeteries, the parks, and the Bathing House.



The Cabinet Building (1819–90). The home of the mineral and geology collections from 1820 until 1876.

Purchase of the Gibbs Cabinet

By 1820, Colonel Gibbs had completely gone through his inheritance from his father, and had been compelled to mortgage his Long Island estate. In May 1825, Silliman was shocked to receive a letter from Gibbs announcing that his cabinet was for sale for $20,000 and that Yale could have first refusal. $20,000! An enormous sum, equal to more than two-thirds of the college's entire income of that year.[37] There was no hope that the college could provide the money, but to Silliman it was absolutely unthinkable that such a treasure should be lost to Yale. President Day, Treasurer James Hillhouse, the rest of the faculty, and the Corporation agreed, but where was the money to come from? "... our only resource appeared to be—to call again—as had always been done from the founding of the College—upon the loyalty of our alumni & the liberality of the friends of Science and of the College—a resource which had never failed in previous exigencies."[38]

Although Silliman was always very successful at persuading the President and the Corporation of Yale to approve his various schemes (often to the chagrin of other professors who hoped in vain for funds for their own projects), this was quite a different matter. Fund raising is not a pleasant task, and we must admire his heroic efforts and the enthusiasm and persistence he inspired in his cosolicitors to save the cabinet.

The first step was to prepare and distribute a handbill calling the citizens of New Haven to a public meeting, which was held on 17 May. One of the speakers was the Reverend Harry Croswell, of Trinity Church. "He gave an intimation that if New Haven did not come forward and secure the Gibbs Cabinet, Hartford might secure it, as the people of Hartford were always prompt and liberal in cases where their local interests were concerned, and they too had a college."[39]

Immediately after the meeting a house-to-house canvass of New Haven was begun, led by Benjamin Silliman, which succeeded in raising about $7700. The Honorable Simeon Baldwin contributed $50, the largest amount he ever gave for any secular cause. The officers and faculty members of Yale College contributed $2300, of which the largest gift was $500 from "Sachem" James Hillhouse, Congressman, Treasurer of Yale for 50 years, and public-spirited citizen par excellence. Ten thousand dollars was thus pledged in New Haven, but there was a long way still to go. At the end of May, Benjamin Silliman and Professor Chauncey Goodrich went to New York City[40] and began another door-to-door appeal on foot, "often oppressed by the heat and occasionally cooled by an ungracious reception." One memorable incident concerned "an opulent Bachelor. I found him in his counting room and begging an audience of a few minutes I began to state my case as briefly and perspicuously as possible . . ." Silliman was cut short as the man "civilly however, said—'Sir I beg you to spare me the story' and handing me a check for One Hundred Dollars I had only to thank him, make my bow & my exit."[41] A meeting was also held in New York and with the help of many friends of the college nearly $3000 was raised. A printed circular mailed to alumni and friends in other states brought in further funds, including $100 from Vice President John C. Calhoun (Yale B.A. 1804). Altogether between $14,000 and $15,000 was given or pledged. This left a balance—a large amount in itself—which the college had to assume, and which was a burden for several years, but the Gibbs Cabinet now belonged to Yale.

There has always been some confusion about the number of specimens in the Gibbs Collection—estimates have ranged from 6,000 to 20,000—but after careful examination of the existing catalogues and contemporary descriptions, it seems to me that 12,000 is a conservative minimum figure, and that there were originally perhaps as many as a thousand or two more.

Large, gorgeous, impressive, and expensive as it was, the Gibbs Cabinet had a serious deficiency as far as its educational utility was concerned: it contained no American minerals. In the early days, Silliman and his students had scoured the New Haven area for specimens. The most notable find was made on a class outing by Solomon Baldwin (Yale B.A. 1811), who discovered a deposit of verd antique (serpentine) marble in Milford. In 1811, Colonel Gibbs initiated an annual prize of 100 duplicates from his collection to the best student in mineralogy. Baldwin was the first recipient. After he graduated from Yale, he formed a company to mine and work the dark bluish-green and white-streaked stone—cut into slabs and polished, it made beautiful table tops and mantelpieces (perhaps a few are still to be found in old New Haven houses)—but for geological reasons the project proved to be uneconomical. Baldwin died in 1816.

The Lederer Collection

In 1843 the opportunity came to round out the cabinet with an extensive collection of exclusively American minerals, put together by Baron Alois (Louis) J. X. von Lederer, the Austrian Consul-General to the United States, during the quarter-century of his residence here. Collecting minerals had been his hobby, and he had exchanged specimens with most of the noted mineralogists and naturalists of the time. Through his good offices, several Americans, including Benjamin Silliman, enriched their collections by exchanges with the Royal Museum in Vienna. Baron Lederer's collection of European minerals was bought by the University of Michigan in 1836, and he was on the point of advertising his American collection for sale when he died in December 1842.

This was another chance not to be missed, as the Baron's collection contained 3,003 excellent specimens, some from localities exhausted even then; many of them were duplicates of a collection he had made for the Vienna Museum. (He had a truly curatorial soul: he catalogued his collection with *two* numbering systems, and affixed *two* numbered labels to each specimen, so that if one were detached, positive identification could be made from the other!)

Once again money had to be raised, but this time it was Benjamin Silliman, Jr., his father's assistant, who knocked on doors in New Haven and New York and sent the printed circulars to friends in other cities, in an attempt to secure $3000. Perhaps this may not have been the best method, but it had worked before and why not again? For one thing, the Lederer Cabinet lacked the impact on the community that the Gibbs Cabinet had exerted; for another, many alumni had just contributed all they could spare to the College's fund drive for the new library (now Dwight Hall and Dwight Chapel). At any rate, Silliman, Jr., only succeeded in obtaining less than $2,200. Even with the asking price reduced to $2,800 that left yet

Broadside printed after the meeting of 17 May 1825.

MEETING OF THE CITIZENS.

At a large and respectable meeting of the citizens of New-Haven, held at the Court-House, pursuant to public notice, on the evening of May 17, 1825, *the Hon.* Wm. Bristol *was called to the chair.*

A statement was made by the President of Yale College, that Col. George Gibbs had generously given to the Institution the use of his large and valuable Cabinet of minerals, during the last fifteen years; that the proprietor, being about to remove his residence to Europe, has resolved to offer his Cabinet for sale in this country or abroad; that the funds of the Institution are entirely inadequate to the purchase, and that very great injury is apprehended to the prosperity both of the College and the city, if the Cabinet is permitted to be removed. After further explanations by Prof. Silliman, a resolve was offered by Charles Denison, Esq. in the following words:

"*Resolved*, as the sense of this meeting, That a united effort should be made to retain the Cabinet of Col. Gibbs in this town, and that a Committee be appointed to co-operate with the Officers of Yale College, in presenting to the citizens a subscription for this purpose."

After a number of impressive remarks in support of this resolution, by the Rev. H. Croswell, the Hon. David Daggett, William Austin, Jun. and the Rev. Mr. Bacon, the question was put and carried unanimously.

The committee, appointed under the foregoing resolution, met at the New-Haven Bank, on Tuesday morning at nine o'clock, and passed the following resolve:

"*Resolved*, That the inhabitants of this town having a deep pecuniary interest in this subject, a *general* invitation be given to all the citizens to subscribe; and that subscriptions be received in sums payable on the first day of August next, or in four equal and annual instalments, to commence with the first day of August next, or on such other conditions as the donors shall prescribe."

The object in view presents a powerful appeal to the interest and honour of our city. It is not to attain a distant and doubtful good, but to provide against certain and severe evil, that we are called to unite our efforts.

It is not too much to say, that the Cabinet of Col. Gibbs has, in a great degree, *created* the science of Mineralogy in this country. It has given to our College a high pre-eminence over every other institution of the United States, in *the means of instruction* in this branch of science—a science so peculiarly important to a new country whose resources are yet to be explored, so popular and fascinating as a part of collegiate pursuits.—This Cabinet, it is well known, has for fifteen years drawn to the College large numbers of students from distant states, and has been at once its ornament and pride, an instrument of valuable knowledge, and a source of constant and increasing prosperity to our city. It is the first object for which strangers seek. It is viewed with admiration by all, and with the greatest admiration by those who are best acquainted with such collections. It is known throughout our country, and serves, not only to increase the number of those who remain among us for the acquisition of knowledge, but to draw great numbers more to this city, in the indulgence of an enlightened and liberal curiosity. The course of instruction in the College, the habits of our citizens, the intercourse of scientific men, and the just expectations of the country at large, have all been shaped in correspondence to this state of things. It is this which has induced the American Geological Society to deposit at the College its valuable and increasing collection of minerals, books, and papers. It is this which has united the talent and industry of the country in support of "The Journal of Science," published in this town; a work which not only confers an honourable distinction on the College from which it proceeds, but has carried the reputation of our country to most of the enlightened nations of Europe. It is the Cabinet of Col. Gibbs which has made New-Haven the central point of mineralogical and geological science for the United States. Wherever this Cabinet is placed, that centre must go with it; and the people of our country would hear with astonishment, that three thousand dollars a year, for four years, could not be raised in the city of New-Haven, to secure to us, for ever, the honour and advantage which we now enjoy.

This, then, is the question presented to our citizens: Shall the central point of mineralogical and geological science for the United States be removed from this city? Shall our College stand before the public stripped of those means of instruction, which half a century could not restore? Shall this College, almost destitute of funds, and relying for existence on its character alone, be announced to the public as a declining Institution? Will not our citizens feel humbled before the world, to see what they have so long regarded as their *own*, pass quietly into the hands of others? On the strictest calculations of interest, shall we see an Institution, which brings so large a sum of money to be annually expended among us, weakened in the seat of its strength, stripped of its peculiar character and ornament, beginning to languish and decline, while powerful competitors are rising on every side—its attractions diminished and transferred to others, its hold on the public relaxed, its students withdrawing to institutions supported with greater enterprise and vigour? Shall we see a neighbouring city subscribe nearly forty thousand dollars, in the hope of rearing an infant Institution as a source of wealth, and shall we suffer our College to sink, after the benefits of a century, in the maturity of its strength, and the fulness of its reputation? —There is no alternative. An institution like Yale College, which depends on its *character* alone for existence, must stand in the first rank of institutions in our country, or it must sink to nothing. For the seat of a *great and flourishing* University, New-Haven has advantages beyond every spot in the United States. Almost every village in the interior is better adapted to an institution of a *secondary* rank, with limited means, and inferior reputation. If our College is ever suffered to decline, the downward progress will be rapid and fatal. We cannot admit the belief, that the inhabitants of our city will suffer this progress to commence, and be compelled to lament their error on this subject, when it is too late. The appeal comes home to every man among us who has business to be diminished, or property to sink in value, or a share in the common honour of our city to be sacrificed. We trust all will combine in these exertions; that all will feel an honourable emulation to contribute something to this object—that all will unite in the decision—THE CABINET SHALL NOT LEAVE THE CITY.

COMMITTEE.

William Moseley,	Marcus Merriman,
Abraham Bradley,	William H. Jones,
Eneas Monson, Jr.	Asahel Tuttle,
George Hoadly,	James Brewster,
Abraham Bishop,	Zebul Bradley,
Nathan Peck,	Stephen Huggins,
William H. Elliot,	Wooster Hotchkiss,
Dennis Kimberly,	Roger S. Skinner,
William Mix.	William J. Forbes.

another balance for Yale to assume, and for the first time, as Silliman, Sr., was informed, there was considerable opposition and debate amongst the members of the Corporation. And no wonder! The mineral cabinet had so far cost the College nearly $9,000, with no end in sight.

It is appropriate to ask a question here. Why have a mineral collection at all? Was Silliman wise in committing the College not only to the large sums of money required for the purchase of these collections, but also to the permanent expenditures necessary to house, care for, and add to them? The answer to this seems to have been stated best by the late Wilmarth Lewis, friend of the Peabody Museum, who wrote, ". . . fine collections attract great scholars, great scholars attract brilliant disciples, the quality of the institution's teaching is improved, and the students are the gainers thereby. Everyone is benefited by collections, whether they know it or not."[42]

Other acquisitions

Only Benjamin Silliman's landmark acquisitions have been described here. There were many, many donations of specimens all along (some of them from Colonel Gibbs himself), as well as some small purchases.

Deposited in the Cabinet were the rock and mineral collections of two defunct organizations: the American Geological Society (1819–1828) and the Yale Natural History Society (founded 1834). In its short life of about eight years, the latter group accomplished much in the development of natural history at Yale. With great enthusiasm, its members read scientific papers to each other, made plans for a library, and accumulated significant collections in zoology and geology. The Society's outstanding possession was a splendid collection of 150 birds from the East Indies, bought in Singapore. This was presented by one of its members, the Reverend Peter Parker (Yale B.A. 1831, M.D. 1834), a medical missionary who "opened China to the Gospel at the point of his lancet."[43] The birds were housed in glass cases in the museum of Yale's Medical School, much admired but regrettably uncared for. By the time the first Peabody Museum was built, where they would have been put on display, most of them were found to have deteriorated so badly that they were only good for use as bones for the Osteology Collection.

Until mid-century, the Cabinet was mainly a collection of rocks and minerals. It included some shells and some corals; there were several cases of fossils, but not nearly enough to illustrate the geology lectures. On display in the Cabinet was a large collection of European fossils belonging to Silliman that he had received from his English friend, Gideon A. Mantell,[44] and other friends in Europe, but they were not strictly part of the Cabinet until the College purchased them of him after he retired.

But it was American fossils that were badly needed.

The American Journal of Science

After the demise of Archibald Bruce's short-lived and irregularly published *American Mineralogical Journal* (1810–1814), in which both Silliman and Colonel Gibbs had published articles, a replacement was badly needed. At the urging of Colonel Gibbs and other scientists, in 1818 Benjamin Silliman founded the *American Journal of Science*, probably his most important contribution to the development of science in America. "Silliman's Journal" provided a regular and dependable outlet for the work of American scientists, especially geologists and naturalists. Through exchange, he received many of the scientific journals of Europe, from which he published excerpts to keep his American readers apprised of the latest European discoveries.

It was very convenient for Yale scientists to have a publication close at hand: Silliman published many of the papers delivered before the Connecticut Academy of Arts and Sciences, as well as the short-lived American Geological Society and Yale Natural History Society. O.C. Marsh made good use of its accessibility years later to rush his newly named fossil species into print.

Silliman little imagined that before long there would be a surfeit of American fossils, fossils that would eclipse his precious minerals in their fascination for the public—O.C. Marsh's dinosaurs.

Benjamin Silliman and the Origin of the Peabody Museum

Benjamin Silliman's renown was the reason why James Dwight Dana came to Yale as an undergraduate in 1830. In 1853 Silliman retired, though he continued to teach geology and mineralogy for two more years until Dana, by then his son-in-law, already world famous for his scientific books and papers, was ready to take over. Yale's young scientific school was flourishing, with some of Silliman's former students as instructors. O.C. Marsh's biographers, Charles Schuchert and Clara Mae LeVene, decided that it was this scientific atmosphere that attracted Marsh, already an avid mineral and fossil collector, to Yale in 1856.

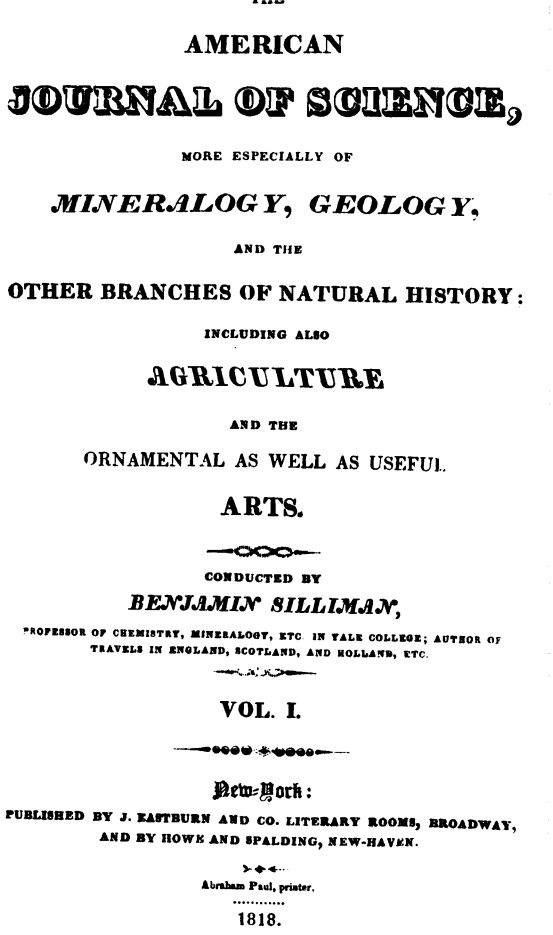
If Silliman had not made Yale a great center of science, and if Marsh had gone to Harvard, as Peabodys usually did, we would not now have a Peabody Museum. Various writers, however, beginning with Schuchert and LeVene, have suggested that Silliman played a more direct part in securing George Peabody's benefaction to Yale. I am not convinced that this was so.

George Peabody (1795–1869), born in South Danvers (afterwards renamed Peabody), Massachusetts,

In the early days Silliman welcomed papers on all subjects that could add to scientific or technical knowledge—the very first article in the first issue was on musical temperament—but (reflecting the *Journal's* financial problems) he also took pains to include "miscellaneous pieces" so that it "might not be too repulsive to the general reader." For this he received a considerable amount of criticism which he fended off, writing ". . . our sçavans, unless they would be, not only the exclusive admirers, but the sole purchasers of their own works, must permit a little of the graceful drapery of general literature to flow around the cold statues of science."[1]

As the 19th century wore on, more and more journals appeared that were devoted to a single scientific discipline, and the *Journal's* scope also narrowed—to geology. Today, the oldest continuously-published scientific journal in the United States, it is still one of America's foremost publications in geology.

1. *Am. J. Sci.* 16:v, 1829



THE

AMERICAN

JOURNAL OF SCIENCE,

MORE ESPECIALLY OF

MINERALOGY, GEOLOGY,

AND THE

OTHER BRANCHES OF NATURAL HISTORY:

INCLUDING ALSO

AGRICULTURE

AND THE

ORNAMENTAL AS WELL AS USEFUL

ARTS.

CONDUCTED BY

BENJAMIN SILLIMAN,

PROFESSOR OF CHEMISTRY, MINERALOGY, ETC IN YALE COLLEGE; AUTHOR OF TRAVELS IN ENGLAND, SCOTLAND, AND HOLLAND, ETC.

VOL. I.

New-York:

PUBLISHED BY J. EASTBURN AND CO. LITERARY ROOMS, BROADWAY, AND BY HOWE AND SPALDING, NEW-HAVEN.

Abraham Paul, printer.

1818.

Title page of the first issue of the *American Journal of Science*, July 1818. Courtesy of the Geology Library, Yale University.

made a huge fortune as an international banker, based in London. In 1856–57 he visited this country for the first time in 20 years. In July 1857 he stopped by New Haven to see his nephew, O.C. Marsh, then finishing his freshman year at Yale College, and whose education he was financing. While Peabody was in New Haven, Benjamin Silliman paid him a courtesy call, which he followed up with a letter a few days later. It has been suggested that this letter in some way influenced Peabody in his decision six years later, in 1863, to bequeath a sum of money to Yale to found a museum of natural history: his inclusion of Benjamin Silliman as one of the trustees is cited as evidence. A rough draft exists of Silliman's letter to Peabody, which was given to the Peabody Museum in 1936 by Miss Maria Trumbull Dana, J. D. Dana's daughter and Silliman's granddaughter. To my knowledge it has never been published, and it is too long to include here in full, but the gist of it is that Yale's Scientific School needed money. The last third of the letter reads:

One of our fellow citizens—Joseph E. Sheffield Esq[r] now travelling with his family in Europe—one of those men whom a good providence now and then raises up with wise heads—large hearts & ample means has contributed a partial foundation for a professorship—has given a large & beautiful lot—for a building at the entrance of the avenue in which I live & we entertain hopes—not without encouragement that he will carry out his enlightened views by erecting a suitable edifice for a school of Science upon the ground which he has given. In the meantime our young & meritorious professors having but slender means of support we may be in danger of losing them as they dream of high attainments—and several departments of the Institution are imperfectly or not at all supplied.

I am aware Sir that no local claims favor any call upon you—that your antecedents—alliances of friendship & business point in another direction and that nothing but your known magniantly [sic] patriotism & benevolence and the favor of a good providence which has given you both the ability and the disposition to do good could apologize for this communication with which no one but myself is acquainted. Any aid—small or large present or prospective & with or without designation of the object would be most acceptable & useful—but we should hope to have permission & to acknowledge the source should you favor this Institution in which however being far on in the evening twilight of life I have no personal interest. I remain dear sir most respectfully & truly yours,

B Silliman sen[r].[45]

This was just the wrong tack to take with Peabody. George Peabody liked to *found* institutions. Silliman pointed out that the Scientific School already had a benefactor, from whom the school could expect more aid (Joseph Earl Sheffield's gifts to the School, which was later named for him, would eventually amount to more than $1,000,000). Silliman said no reply was necessary, and there is no evidence that he received one. In fact, if his draft were not dated, there could be reason to doubt that the letter was ever sent, for all the effect it had. When Peabody finally did decide to favor Yale, it was in response to the promptings of his nephew, O.C. Marsh.

After Marsh graduated from Yale College, and after two additional years in the Sheffield Scientific School, in the fall of 1862 he went to Germany for more postgraduate study. From time to time Marsh saw his uncle, and his letters to Benjamin Silliman, Jr., published by Schuchert and LeVene, report his progress in inducing Peabody to give money for the benefit of science at Yale. The letters make it clear that Peabody's preferred beneficiary was Harvard, and that Marsh had difficulty in persuading Peabody not only to give to Yale at all, but also to give as much to Yale as he planned to leave to Harvard. Silliman, Jr., suggested an argument for Marsh to make, which is a little strange viewed from the perspective of this article: that if Peabody should endow a building, it would be named for him, and it then "turns to his credit all that has been done heretofore in the endowments and purchases of cabinets etc. . . . the name of the Donor is sure to be always prominent and gratefully remembered . . ."[46]

In May 1863 Marsh sent a letter to Benjamin Silliman, Sr., enclosing one also from Peabody, triumphantly announcing a bequest to Yale of $100,000. Silliman was designated a trustee, but so were Silliman, Jr., and J. D. Dana (as well as Marsh and Connecticut Senator James Dixon)—names which could easily have been suggested by Marsh.

In 1866 Peabody visited this country again; the bequest was changed to an outright gift of $150,000, and at that time Yale's Peabody Museum was founded.

Benjamin Silliman by then was gone, but, as we have seen, it was his collections and his teaching in the natural sciences that ultimately created the need for a museum building, and George Peabody's generosity, directed toward Yale by the tact and perseverance of his nephew, that brought it about.[47]

Acknowledgments

Much help in the research for this article was given by the staff of Manuscripts and Archives, Sterling Memorial Library, particularly Patricia Bodak Stark, John Espy, and Marguerite Witkop. Of the Peabody Museum staff, Zelda Edelson, Jean Lawless, Ellen Warren Faller, and Professor Horace Winchell provided information and/or suggestions. More help was given by Mary L. Greene, Jack L. Lee, Dr. Piero Lattanzi, and Professors John Rodgers, K. S. Narendra, and Philip Mars.

Sources

The early materials relating to the mineral collection are in the files of Manuscripts and Archives, Sterling Memorial Library. These include the original catalogues of the collections of Gigot d'Orcy, Count de Bournon, and some other components of the Gibbs Collection, as well as of Baron Lederer. For many years it has been believed that minerals of the Gibbs Cabinet can no longer be identified. This is not wholly true. Specimens of Gigot d'Orcy's collection can be readily identified providing their 200-year-old labels are still attached. Many large and showy specimens, some of them on display in the Peabody Museum's new Silliman Hall of Minerals, might have been assigned to this collection because of their localities, but they have invariably somehow lost their labels. There is no way known now of identifying specimens from the Senter or Perkins collections.

Benjamin Silliman's nine-volume reminiscences have been quoted extensively. Where possible, quotations have been taken from the biography of Silliman by G. P. Fisher, who, in publishing many excerpts from the reminiscences, added punctuation and corrected spelling errors. In quotations taken directly from the reminiscences, a very few similar corrections have been made for the sake of readability.

Notes

1. Quoted in George P. Fisher, *Life of Benjamin Silliman, M.D., LL. D.*, 2 vols. Charles Scribner and Company, New York, 1866. 1:195–196.
2. An article for *Discovery* on Yale's early museum is in preparation.
3. Benjamin Silliman, An address delivered before the Association of the Alumni of Yale College, in New Haven, August 17, 1842. New Haven, 1842. p. 27.
4. Translation: Woman has (ever) been the most dismal cause (of warfare). I think this is Silliman's paraphrase of part of a passage from Horace (Satire 3, lines 107–108):
Nam fuit ante Helenam cunnus teterrima belli
Causa . . .
Horace was required reading for Yale sophomores.
5. Fisher, 1:215–216.
6. Simeon E. Baldwin, *Life and Letters of Simeon Baldwin*. The Tuttle, Morehouse & Taylor Co., New Haven [1919], pp. 345–346.
7. Benjamin Silliman, A sketch of the mineralogy of the town of New-Haven. *Mem. Conn. Acad. Arts Sci.* 1:88, 1810.
8. Fisher, 1:175.
9. Benjamin Silliman, A sketch of the mineralogy of the town of New-Haven. *Mem. Conn. Acad. Arts Sci.* 1:96, 1810.
10. Benjamin Silliman, Review of an elementary treatise on mineralogy and geology. . . by Parker Cleaveland. . . *Am. J. Sci.* 1:36, 1818.
11. Edward Hitchcock, A sketch of the geology, mineralogy, and scenery of the regions contiguous to the River Connecticut, Part 3. *Am. J. Sci.* 7:20, 1824.
12. Because specimens were kept in cabinets, "cabinet" had become a synonym for (a sizable) "collection."
13. [Benjamin Silliman], "The Chemical establishment

in Yale College. . . ,'' [1807]. Silliman Family Papers, Yale University Library (hereafter YUL).
14. Fisher, 1:221.
15. George J. Brush, A sketch of the progress of American mineralogy: an address delivered before the American Association for the Advancement of Science, at Montreal, August 23, 1882. New Haven, undated, p. 19.
16. For more details see *Discovery* 13:10–12, 1978.
17. Benjamin Silliman to mother, New Haven, June 16, 1807. Silliman Family Papers, YUL.
18. Fisher, 1:219–220.
19. Fisher, 1:256.
20. The chronology of these events is given here as Silliman gives it in his reminiscences and elsewhere. However, his memory is apparently inaccurate: there is evidence that Colonel Gibbs did not offer to deposit his cabinet at Yale until March 1811. See John C. Greene and John G. Burke, The science of minerals in the age of Jefferson. *Trans. Am. Philos. Soc.* 68 (4), 1978, p. 100.
21. Benjamin Silliman, Origin and progress of chemistry, mineralogy and geology in Yale College with personal reminiscences, 4:53. Silliman Family Papers, YUL.
22. Ibid.
23. Fisher, 1:257.
24. Subsequently, there was concern about the safety of the Cabinet for the more than two years that the British controlled Long Island Sound, but New Haven was spared.
25. Fisher, 1:259.
26. Benjamin Silliman, Origin and progress. . . 4:55.
27. [Benjamin Silliman], Mineral cabinet of Yale College [c. 1831], Silliman Family Papers, YUL.
28. Benjamin Silliman, Origin and progress. . . 4: inside back cover.
29. E. C. Howard, Experiments and observations on certain stony and metalline substances which at different times are said to have fallen on the earth; also on various kinds of native iron. *Phil. Trans.* 1802, pp. 168–212.
30. Count de Bournon, Description of the corundum stone, and its varieties, commonly known by the names of oriental ruby, sapphire, &c with observations on some other mineral substances. *Phil. Trans.* 1802, pp. 233–326.
31. Benjamin Silliman, Origin and progress. . . 4:52.
32. Another son, Andrei, commissioned Beethoven to write the works known as the three Razumovsky String Quartets, Opus 59.
33. Benjamin Silliman, Origin and progress. . . 4:52.
34. Gibbs's grand collection of minerals. *Med. Repos.* 11:213–214, 1808.
35. Benjamin Silliman, Origin and progress. . . 4:104.
36. Benjamin Silliman, Origin and progress. . . 4:114.
37. Brooks Mather Kelley, *Yale: A History*. Yale University Press, New Haven, 1974, p. 149.
38. Benjamin Silliman, Origin and progress. . . 4:142.
39. Fisher, 1:280. A clever stratagem, designed to play upon the traditional New Haven-Hartford rivalry.
40. The portrait of Benjamin Silliman on page 12 was painted in New York at this time.
41. Benjamin Silliman, Origin and progress. . . 4:146.
42. Wilmarth S. Lewis, *The Yale Collections*. Yale University Press, New Haven, 1946, pp. ix–x.
43. James B. Reynolds, et al. [eds.], *Two Centuries of Christian Activity at Yale*. G. P. Putnam's Sons, New York, 1901, p. 299.
44. See *Discovery* 10:3–13, 1974.
45. Benjamin Silliman to George Peabody, New Haven, July 30, 1857. O.C. Marsh Papers, YUL.
46. Charles Schuchert and Clara Mae LeVene, *O.C. Marsh, Pioneer in Paleontology*. Yale University Press, New Haven, 1940, p. 77.
47. It is interesting to note that these three had a common ancestry! The Peabody Family was established in America by two brothers. One, the ancestor of George Peabody and O. C. Marsh, settled in Massachusetts. The other, from whom Benjamin Silliman was descended through his maternal grandmother, founded the Rhode Island branch of the Peabodys.

Other References

1. Beckham, Stephen Dow, Colonel George Gibbs, *in* Leonard G. Wilson [ed.] *Benjamin Silliman and His Circle*. Science History Publications, New York, 1979.
2. Chester, Albert H., *A Dictionary of the Names of Minerals*. John Wiley & Sons, New York, 1896.
3. Dexter, Franklin B., *Biographical Sketches of the Graduates of Yale College with Annals of the College History*. 6 vols. Yale University Press, New Haven, 1885–1912.
4. Endicott, C. M., *A Genealogy of the Peabody Family*. David Clapp & Sons, Boston, 1867.
5. Fulton, John F. and Thomson, Elizabeth H., *Benjamin Silliman 1779–1864, Pathfinder in American Science*. Henry Schuman, New York, 1947.
6. Geikie, Sir Archibald, *The Founders of Geology*. 2nd. ed., 1905. Dover Publications, Inc., New York, 1962.
7. Gibbs, George. *The Gibbs Family of Rhode Island and Some Related Families*. Privately printed, New York, 1933.
8. Mason, George Champlin, *Reminiscences of Newport*. Charles E. Hammett, Jr., Newport, 1884.
9. Sears, D. W., Sketches in the history of meteoritics 1: The birth of the science. *Meteoritics* 10:215–225, 1975.