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Herman Melville and Joseph Henry at the Albany Academy; or, Melville's Education in Mathematics and Science

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Over twenty years before he became the first Secretary of the Smithsonian, Joseph Henry was a professor at the Albany Academy. And Herman Melville was one of his students. In fact, Melville, who frequently struggled in school, won a book award for finishing first in Henry's class. This encounter could not have happened in a more fortunate moment: In 1831 Henry built the most powerful magnet ever constructed, designed the first prototype of a telegraph machine, and was part of a groundbreaking weather data project, which became the Smithsonian's first major initiative. This essay questions a biographical tendency to minimize Melville's remarkable education in mathematics and science, which received mention until 1952 when it was written out of Melville's history. But it reaches beyond recovery and to the discovery of new material about Melville's education in Joseph Henry's papers. In this essay, I offer a descriptive account of Melville's education, argue against a critical belief that "Melville had no more instruction in science" "than the average boy of his times," and suggest that this new reading forces us to confront a Melville for our time: an author influenced by and interested in both mathematics and science.

Decades before his image was cast in bronze in the Library of Congress, and over twenty years before he became the first Secretary of the Smithsonian, Joseph Henry was a professor at the Albany Academy (Henry *Papers* 134).[1] And while this connection has not been made in print, Herman Melville was one of his students.[2] In fact, Melville, who frequently struggled in school, won a book award for finishing first in Henry's class (Parker 55). The year was 1831, and Henry made a name for himself, that year, as a brilliant experimentalist who built the most powerful magnet ever constructed (Sherman; Fleming 21). Then he designed the first prototype of a telegraph machine. Over a mile of wire was wrapped around one of the upstairs rooms in the Albany Academy. And perhaps not surprisingly, Henry "consistently demonstrated this arrangement to his classes," tapping a magnet to sound a bell across the room—and shocking his

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students with action at a distance (Hochfelder). This seems to have made quite an impression on Melville: years later a piece of rusty telegraph wire sat on his desk as he was writing.[3] And his fiction went on to give surprisingly prominent roles to telegraphs, Leyden jars, lightning rods and magnets.

In 1831 the Albany Academy was also the national center of work on meteorology, thanks to a law requiring the thirty academies chartered by the state to provide annual weather reports in order to receive funding (Fleming xxi, 9; *Henry Papers* xxvi; Regents 12). Data sheets were sent to the capital from across the state, and the school's principal, T. Romeyn Beck, collected and reported the results, along with Joseph Henry, who went on to dedicate thirty percent of the research budget of the brand new Smithsonian Institute to an almost identical national system "for solving the problem of American storms" (Beck 1; Fleming 76). In Henry's papers we find evidence that even younger Academy students had at least some awareness of this program.[4] And by the time Melville was asked to be part of the school's fiftieth anniversary celebration in 1863, his invitation from his uncle, Peter Gansevoort—then President of the Board of Trustees—tellingly invoked his deep appreciation of the Academy's contributions to "Science" (*Correspondence* 689).

Melville's relationship with Henry does not seem to have been mentioned in print since 1951, when William Gilman explained that the "most famous of the faculty was Joseph Henry, whose invention of the electromagnet in 1829 laid the foundation for Morse's telegraph" and was available "for all the students to see" (52). In the same year, Leyda's *Melville Log* referenced Henry's "lectures and experiments in chemistry" (46). And Raymond Weaver discussed both Henry and his lectures in the first full-length biography of Melville in 1921 (71). But looking forward to work like Hershel Parker's 2000-page *Herman Melville: A Biography* (1996, 2002) and Laurie Robertson-Lorant's 700-page *Melville: A Biography* (1996)—great leviathans in their own rights—we do not find engagement with Melville's connections to science or mathematics.

Parker does offer one brief related reference: "Herman took an arithmetic class under the care of Professor Henry," and he "surprised everyone" when he did "extremely well." In fact, Parker continues, Melville "was awarded first premium in his class" along with a book inscribed:

> ALBANY ACADEMY
> To Herman Melville
> The first best in his class
> in ciphering books (55).[5]

Unfortunately in the midst of his incredibly thorough biography, Parker does not consider the source of this "surprise." He does not consider Melville's

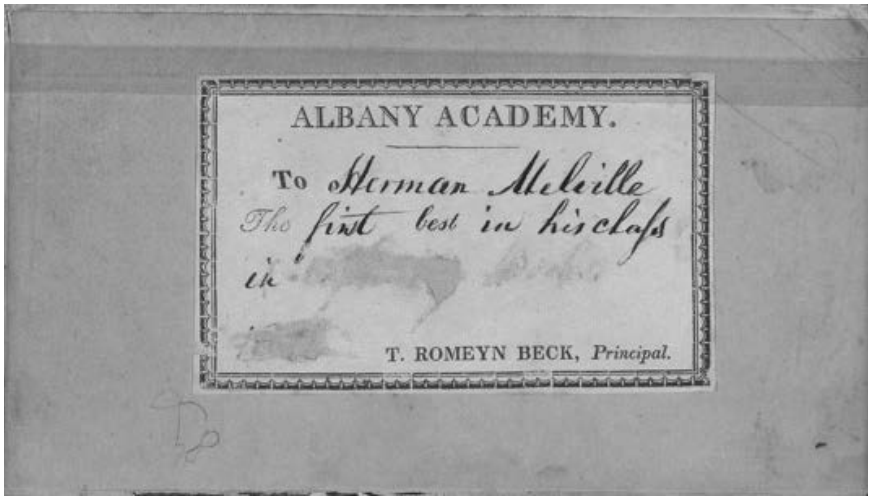


Fig. 1. Melville's copy of *The London Carcanet*, complete with the inscription that celebrated his first premium. Photograph courtesy of the Yale Collection of American Literature, Beinecke Rare Book and Manuscript Library.

skill in mathematics. And he does not identify Henry. Robertson-Lorant's account of this event is equally instructive. She immediately shifts from Melville's "mathematics examination" to the fact that the book he received as his prize "ignited a spark of poetry in his soul"—arguably transposing Melville's math award into a sort of origin story for his "literary" future (46). My goal, here, is not to criticize some of Melville's most thoughtful biographers. Instead I read these two moments as symptoms of a much broader tendency to minimize records that would produce an almost unrecognizable "Melville": a student of Joseph Henry who excelled at mathematics and who held a privileged position at the heart of Albany's remarkable science and technologically-focused environment.

My essay has two complementary goals: to supplement recent biographical work on Melville and to be available as historical scaffolding for work on Melville's engagement with different branches of science, technology, engineering, and mathematics. To do this I draw, extensively, on archival material from the Smithsonian and from the Albany Academy Archives. But I also consolidate lost references from older work. (This is recovery, not just discovery).[6] In fact this essay was prompted by a stunning realization: Melville's education in mathematics and science was not simply overlooked. It was written out of Melville's history.

It is not possible to assess the causes of this shift in the space of this short essay, but I would like to quickly sketch a few factors that seem relevant.

Turning to science and mathematics is potentially in conflict with the construction of a "literary" figure. (Melville's ciphering award, after all, prompted a story about poetry. And this transition took place after 1951, or in the moment C. P. Snow identified the emergence of "literary intellectuals" and "scientists" as two separate "cultures." The 1950s also gave rise to what Donald Pease, Christopher Castiglia, and others have identified as a "Cold War Melville," which prompted a different set of organizing principles. And even more locally, Tyrus Hillway—a founder of the Melville Society (1945) and an expert on Melville and science—may have helped close this line of inquiry when he disposed of Melville's formal education in just over one page.[7] His "Melville's Education in Science" (1974) only offers: "his beginning in scientific study was a slight one," and the classes that "were taught at the Albany Academy . . . could not have added much." In fact, Hillway continues, "Melville had no more instruction in science" "than the average boy of his times" (412).

The story that I offer here does not take the form of an argument. Instead my focus is on providing a compelling biographical account. But this narrative also serves as evidence that supports one central claim: Melville had a stunning education in what we now call "STEM" fields. Or, if critique is necessary, my argument is that Hillway's claim is false. Melville had formal and informal instruction in science that was certainly above "the average boy of his times." He attended the best school in New York at a time when only half of the state's children received any education at all (*Henry Papers* 240). That school had a focus on mathematics and science that rivaled top colleges, which was in line with the innovative or technologically-inspired atmosphere of Albany at the time. And while it's methodologically problematic to make generalizations about the effect this rich experience may have had on Melville's fiction, it seems equally problematic to ignore it. So here I offer a sketch of intellectual life in Melville's Albany, a description of Melville's likely relationships to Joseph Henry, and a more detailed account of the scientific resources and discoveries at the Academy while Melville was enrolled. I conclude with a brief discussion of the ways this consideration of Melville's history might shift our responses to his writing in a moment that seems to be characterized by a materialist turn.

This conclusion turns to three current conversations: Melville's engagement with Matthew Fontaine Maury's charts, his entanglement of humans and non-humans, and his references to telegraphs. But these are only flash points. And ultimately my hope is that this story about Melville's development will bring new moments into focus. After all, Moby Dick is "all magnet." Ahab's "magnetic life" is a "Leyden Jar."[8] And in "The Candles" Ahab's magnetized compass directly resembles experiments that Henry conducted in the Academy's park.[9] *White-Jacket*, in turn, opens with "capillary attraction" and closes

with atoms and phase changes.[10] *Battle-Pieces*' "Aurora Borealis" shaped one of Henry's public lectures.[11] And *Clarel* closes with the telegraph.[12] I hope these moments—and others—come to mind as this story about Melville's engagement with mathematics and science unfolds.

Loomings; or, Setting the Stage

In 1830 Albany was a thriving city with an equally thriving intellectual life (Gilman 44). It was so desirable, in fact, that when Joseph Henry—a high school teacher with no college degree—was offered a position at Princeton, he was hesitant to leave. He explained:

> I would not however readily exchange my present situation for many that might offer . . . The Institution is very flourishing and established . . . and as Librarian of the Albany Institute I have access to a valuable collection of scientific works and most of the European periodical publications. In connection with Dr. T. R. Beck I have the principal direction of the meteorological observations made by the different academies of the state of New York to the Regents of the University. In this work I am considerably interested and have hopes at some future time to deduce many facts from it of importance to the science of Meteorology (*Henry Collection* Box 7, Folder 9).

Albany was the sort of place where Henry could give multiple public lectures on topics like "Galvanism, a science then but little understood" and have those lectures be "attended by a large Assembly of the Elite from Albany and its surroundings" (*Henry Collection*, Box 27, Folder18). Evening "lectures and experiments in chemistry" "were favored with the presence of young ladies as well as young gentlemen" (Leyda 46). And the Albany Institute was formed with the "high purpose" of promoting "useful improvements" to "elevate the character of the state." The group began to publish its *Transactions* with the explicit purpose of disseminating a taste for knowledge (Albany Institute 3, 153). Citizens were engaged in academic and intellectual debates. And they actively followed the conversations of scholars in their moment (*Henry Collection* Box 7, Folder 4).

Donations to advance scientific work in the community were also common. In 1832, Henry gave a public lecture on the aurora borealis and its influence on "magnetic intensity at Albany." Then he published it in the annual meteorological report to the Regents (*Aurora Borealis* 2). His goal was to drum up support for a petition for "funds to purchase an apparatus for observations in terrestrial magnetism" (*Henry Collection* Box 7, Folder 9). And this was entirely possible. During Melville's first year at the Academy, for example, nineteen people responded to a call that "friends and guardians" "devise some means" to complete the school's new laboratory (*Henry Papers* 177–178). At a

time when tuition brought in less than $900 a quarter, donors like Stephen Van Rensselaer (of Rensselaer Polytechnic Institute) and William James (grandfather of Henry and William) offered $362 towards purchase of "philosophical apparatuses." These ranged from a telescope with three eyepieces (one terrestrial; two celestial) to an electrical machine that was "perhaps the greatest in diameter of any in this country" and a working model of a hydraulic dam that would raise a small stream up to 40 feet (*Henry Collection* Box 28, Folder 9; *Henry Papers* 305–312).

Albany, in this moment, was defined by innovation. The Erie Canal was completed in October 1825, and by August 1831 the Mohawk and Hudson Railroad Company ran one of the first steam passenger trains in America. But Albany's advances were by no means only technological, even if engineering was the city's driving force. Governor Martin Van Buren invented the first "political machine." (His son John was enrolled in the Academy; see Cole 95; *Henry Papers* 2.131). Long-time member of the Board of Trustees, William James, became the second wealthiest man in America as an importer who "introduced a number of marketing innovations." (His son Henry James Senior was also enrolled in the Academy; see Habegger 15, 65; *Henry Papers* 4.105, 4.181). Stephen Van Rensselaer, a relative and "a major financial supporter of the Academy-centered scientific circle" founded the Academy (Gilman 48). And Herman Melville was part of this world.

Most of us are familiar with Melville's less-than-auspicious beginnings. "As a child, Herman was slow to talk and even slower to read," especially compared to his older brother, Gansevoort (Robertson-Lorant 25). When he started school, "according to his mother, he did 'not appear so fond of his Book as to injure his Health'" (28). The next year, when he was six, he entered the New-York Male High School. It was "set up according to the Lancastrian or monitorial system, a hierarchical pedagogy based on rote memorization, shame, and fear." And "this strict, often abusive educational regimen had a negative effect on the boy. He had trouble learning to read and write, and he never quite mastered handwriting and spelling" (32). By the time he was seven, his father sent him to Albany to spend the summer with his Uncle, Peter Gansevoort—unforgettably describing him as "'very backward in speech and somewhat slow in comprehension'" (Leyda 25).

This is when the story changes. Herman's trip to Albany was in the summer of 1826, and Allan reported to Peter that he returned, "much improved by his visit in mind, person, and estate," having developed "the most affectionate attachment to his Grandmother and Uncle" (Leyda 28). Peter found him quite delightful and described him to Allan in "very flattering terms," adding that Herman had gained his "patronage and instruction," which continued

throughout Herman's life (27). Herman spent the next few years slowly building on this success. First he earned a "best Speaker' commendation" for examinations at the New York Male High School." (Robertson-Lorant 40). Then he became a monitor, appointed to help teach younger students (Parker 47). And by the time he was ten, at the prestigious Columbia Grammar School, even his father acknowledged: "'Herman I think is making more progress than formerly, and without being a bright Scholar, he maintains respectable standing'" (Leyda 43). At this point Melville was, in the words of his father, his Uncle Peter's "little protégé" (29). And while his father may have damaged the family name (along with Melville's self-esteem), a positive recommendation from Peter would have made a difference in Albany.

Just a few weeks before Herman's visit in 1826, Peter Gansevoort had been engaged in a very different task: serving on the Board of Trustees of the Albany Academy when Joseph Henry was elected and appointed Professor of Mathematics and Natural Philosophy (*Henry Collection* Box 28, Folder 8; *Henry Papers* 132, 162). And the year before he had been one of twelve members of

Fig. 2. The Old Albany Academy Building from the Melville's family's "Albany Book" (Sealts 380) captures the exterior of the Academy as Melville knew it. Photograph courtesy of the Gansevoort-Lansing Collection. Manuscripts and Archives Division. The New York Public Library. Astor, Lenox, & Tilden Foundations.

the New York Board of Regents to vote for the establishment of the Academy's groundbreaking meteorology project (*Henry Papers* 106). Peter was also the attorney for the Academy. He kept the school's account book (Gilman 308). And when Herman returned to Albany in 1830, Peter was both a member of the New York State Assembly and the Secretary of the rapidly developing Albany Institute. Beck, the Principal of the Academy, was Vice President. Henry was the Librarian. And there were only six other members of the board (Albany Institute 2). So it is no surprise that, upon moving to Albany, Herman and his brother Gansevoort attended the Academy, along with their cousin Stanwix. Herman did not enter the Academy as just any student. In addition to "belonging to the patrician class of Albany" (Gilman 48), he was, in the words of his father, the "little protégé" of the Academy's attorney, its accountant, a board member, and a friend.

Melville and Henry at the Albany Academy, 1830–1831

In the Fall of 1830, Herman, who was eleven years old, is said to have started the "standard preparatory course in the Fourth Department," or the Academy's elementary school.[13] This was a new program, and a year into its existence, it was dramatically successful. Its primary goal had been to draw younger pupils into the Academy, and only one month after it was announced, the program had outgrown its space. Meanwhile the second goal of the new department was to take pressure off of Beck and Henry, who held the apparently timeless belief that their teaching loads were excessive (*Henry Collection* Box 28, Folder 1). Luckily, that did not go as planned. Henry shared, in response to the offer from Princeton in 1832: "I am engaged on average of seven hours in a day one half of the time teaching the higher classes in Mathematics, and the other one half in the drudgery of instructing a class of sixty boys in the Elements of Arithmetic" (*Henry Collection* Box 7, Folder 9). So while Melville's "teacher for regular subjects" in the Fourth Department was Henry's assistant, George Washington Carpenter, Henry also seemed to be teaching these students (*Henry Papers* 299). And he gave elementary pedagogy a surprising amount of consideration, despite the fact that this was by no means his favorite class.

Henry was very involved in developing the new program's curriculum as the Academy's "Professor of Mathematics and Natural Philosophy." We know, for example, that wrote to the Board of Trustees that it was vital for "natural philosophy, astronomy, the use of globes, and physical geography" to "be considered the most prominent objects of attention" during work in the new Fourth Department (*Henry Papers* 228). And we know even more about

Henry's relationship to these students' arithmetic classes, largely thanks to correspondence about his struggle selecting a textbook that was suitable for "boys 10 or 11 years old" (*Henry Collection* Box 7, Folder 9). Henry actually petitioned the Board to add a more advanced textbook for the Department's "higher students" just months before Melville won his "ciphering" award (Albany Academy Trustees). But unfortunately his best option was still far from satisfactory. At least he described his selection—Daboll's *Arithmetic*—"as a book of examples" that was "good for nothing else." (*Henry Collection* Box 7, Folder 9).

Melville, it seems, may have felt the same way. At least he has Stubb declare, in *Moby-Dick*: "I have heard devils can be raised with Daboll's arithmetic" (333). This attitude was no surprise, given descriptions of the Henry's arithmetic classes: "Students laboriously copied theorems, examples, problems to be solved, and other notes from whatever textbooks were available." They memorized lessons, recited them, and worked hundreds of problems each day. Fourth Department students were especially focused on "rote drilling" and "mental arithmetic," which Henry saw as "the prominent object of the primary or common school." In fact, his "first object" teaching arithmetic was to make every student an "expert accountant" (*Henry Papers* 299, 325; Henry Collection Box 7, Folder 9; Molella 83).

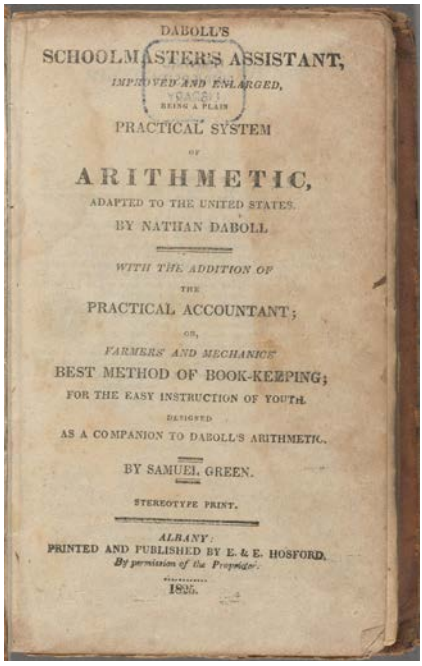
Despite his trenchant support of memorization drills, Henry was generally a remarkably enlightened teacher, largely thanks to his training as part of the "Rensselaer Flotilla": an "experimental traveling summer school" that publicized the Rensselaer School's new focus on "student participation and demonstration" alongside the Erie Canal (Weiner 22; Rezneck 255). At a time when "most schools had no reference books, no critical editions of literary works, no maps, charts, or globes, not even pictures on the walls," Henry stressed the importance of visual props (Swartz 348). The Academy, we learn in its *Statutes*, used "Celestial, & Terrestrial Globes," Wilkinson's Atlas, and Arrowsmith's large maps (Albany Academy 13). And Henry regularly went out of his way to repurpose "common materials" as visual aids for demonstrations. Balls represented "atoms" and were "connected by springs to represent attraction and repulsion." And sponges dipped into glasses of water brought "porosity and absorption" to life (*Henry Papers* 289, 385). But the highlight of Henry's emphasis on visual props required special equipment: the blackboard, at a time when—however hard to believe—this cutting-edge "new media" had not reached most classrooms. Henry made use of blackboards for "demonstrations" in chemistry and mathematics. But he also used them to really capture attention, drawing comics related to his lectures each day. "Steam, for example,

was introduced with a figure in tails riding a cylinder of gas, with a cloud coming out of the rear of the 'machine,' quite graphically demonstrating propulsion" (Swartz 348–354).

We cannot be sure whether Herman stayed in the Fourth Department for the Fall of 1831. The elementary school was intended to be for boys aged six to twelve, who were still unprepared for the school's senior programs (Gilman 54). Only three of the boys were twelve, and Melville had already spent quite a bit of time in school. This possible change in Herman's academic standing is especially intriguing when we add that Henry also taught courses in "Navigation and Surveying" to more senior students (*Henry Collection* Box 28, Folder 8). (Melville completed a degree in surveying in 1838). But in any of the Academy's upper-division departments, Henry would have continued to be Melville's mathematics professor (*Henry Papers* 55, 301). Gilman even speculates that Herman's father would have selected the Mercantile Program, since he was convinced of Herman's "bent for commerce" (Gilman 57). And this is a potentially fascinating possibility: the shorter program emphasized "bookkeeping and mercantile arithmetic," but it included enrollment in Henry's science courses (*Henry Papers* 236).

This mathematical orientation may not have been the stretch that some Melville enthusiasts might be inclined to imagine. Melville was by no means destined for a career as an author at the time. When he was nine, Herman was studying Arithmetic (which, at the time, still was not standard), and he "read in the Scientific class book'" (Leyda 35). By the time he was ten, Herman's father believed he had "'chosen Commerce as a favorite pursuit.'" And here Robertson-Lorant offers a potentially overdetermined suggestion: "Herman's professed interest in commerce must've been a bid to gain his father's approval, as he showed little interest in it later" (42). But the very next year, after moving to Albany, Herman won his award for ciphering books. To be clear: this was, essentially, an award for addition, multiplication, and practical problem solving. Melville "led his class in mathematics and bookkeeping" at the best school in the state (Gilman 56; *Henry Papers* 248). In fact, Daboll's *Arithmetic* included surprisingly difficult problems on topics like annuities, brokerage, commission, discount, and other topics related to accounting.

A number of critics have downplayed this particular achievement. For example, Gilman explains: "from the presentation notice pasted inside the cover reading, 'Herman Melville, first best in his class in Ciphering Books,' he carefully scraped the last two words" because "no one was to know that he had ever won a prize for such useful knowledge" (56). This is a tempting fantasy. But other speculative possibilities certainly emerge. Leyda, more reliably, simply describes these words as "later effaced" (*Log* 48).



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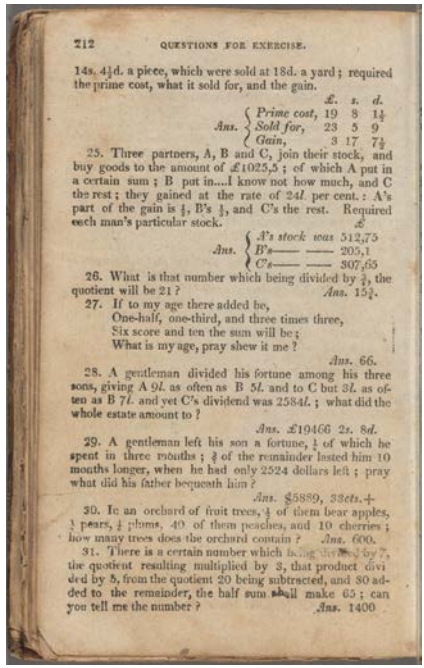


212 QUESTIONS FOR EXERCISE.

14s. 4½d. a piece, which were sold at 18d. a yard; required the prime cost, what it sold for, and the gain.

		£.	s.	d.
Ans.	*Prime cost,*	19	8	1½
	Sold for,	23	5	9
	Gain,	3	17	7½

25. Three partners, A, B and C, join their stock, and buy goods to the amount of £1025,5; of which A put in a certain sum; B put in....I know not how much, and C the rest; they gained at the rate of 24*l.* per cent.: A's part of the gain is ⅓, B's ⅓, and C's the rest. Required each man's particular stock.

		£
Ans.	*A's stock was*	512,75
	B's —— ——	205,1
	C's —— ——	307,65

26. What is that number which being divided by ⅔, the quotient will be 21? Ans. 15¾.

27. If to my age there added be,
One-half, one-third, and three times three,
Six score and ten the sum will be;
What is my age, pray shew it me?

Ans. 66.

28. A gentleman divided his fortune among his three sons, giving A 9*l.* as often as B 5*l.* and to C but 3*l.* as often as B 7*l.* and yet C's dividend was 2584*l.*; what did the whole estate amount to?

Ans. £19466 2*s.* 8*d.*

29. A gentleman left his son a fortune, ⅛ of which he spent in three months; ⅔ of the remainder lasted him 10 months longer, when he had only 2524 dollars left; pray what did his father bequeath him?

Ans. $5889, 33cts.+

30. In an orchard of fruit trees, ¼ of them bear apples, ⅓ pears, ⅛ plums, 40 of them peaches, and 10 cherries; how many trees does the orchard contain? Ans. 600.

31. There is a certain number which being divided by 7, the quotient resulting multiplied by 3, that product divided by 5, from the quotient 20 being subtracted, and 80 added to the remainder, the half sum shall make 65; can you tell me the number? Ans. 1400

Figs. 3a and 3b. Daboll's *Schoolmaster's Assistant*, or his *Arithmetic*, expanded to include *The Practical Accountant* for bookkeeping, includes segments on topics like "Barter," "Brokerage," "Commission," exchange rates for state currencies, "A Few Useful Forms in Transacting Business," and "Questions for Exercise" (included here). I have selected the 1825 edition of Daboll, which was printed in Albany. It is one of three probable editions (along with Ithaca 1829 and Utica 1830), based on information about Academy textbooks and the timeline for the *Arithemetic*'s addition to the curriculum in the trustees' *Notes and General Records*. Photograph courtesy of Harvard Libraries.

Melville's engagement with mathematics and science continued after he left the Academy. He went to work at the New York State Bank, helped keep the books in Gansevoort's shop, and eventually attended the Albany Classical School, where, he may very well have discovered a reported aptitude for "themes" or "compositions" (Robertson-Lorant 60). But this was a school that "furnished every facility to prepare young men for business careers." And Melville enrolled to study with Charles West, who was—like Joseph Henry—"a young chemistry and natural history scholar" (Gilman 71).[14] When Melville turned to teaching, his only discussion of students was focused on Arithmetic (*Correspondence* 7). And when he needed to find a way to support his entire family, he enrolled in a surveying course at the Lansingburgh Academy. In short, after his time at the Albany Academy, Melville worked at a bank,

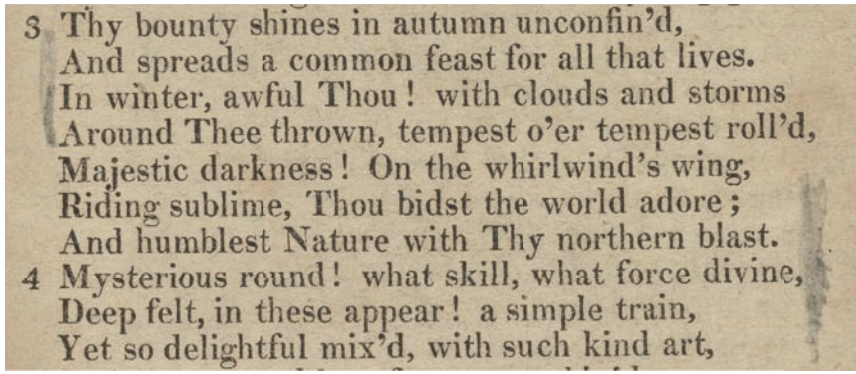

3 Thy bounty shines in autumn unconfin'd,
And spreads a common feast for all that lives.
In winter, awful Thou! with clouds and storms
Around Thee thrown, tempest o'er tempest roll'd,
Majestic darkness! On the whirlwind's wing,
Riding sublime, Thou bidst the world adore;
And humblest Nature with Thy northern blast.
4 Mysterious round! what skill, what force divine,
Deep felt, in these appear! a simple train,
Yet so delightful mix'd, with such kind art,

Fig. 4. This image from Melville's copy of *Murray's English Reader* captures the only marking in his English textbook. It draws attention to a discussion of the weather and a whirlwind in Thomson's "Hymn on a Review of the Seasons." Photograph courtesy of the Gansevoort-Lansing Collection. Manuscripts and Archives Division. The New York Public Library. Astor, Lenox, & Tilden Foundations.

kept books in a shop, and then taught mathematics before turning to a field that required him to learn geometry and trigonometry. Only after that failed—when he was unable to secure a position in engineering—Melville "called upon the only other talent he had" and submitted his first story (Gilman 103–108; Parker 137).

One anecdote, in particular, draws out a very different perspective on Melville's engagements with literature and science during his time at the Academy. Melville's literature textbook was *Murray's English Reader*. But instead of serving as the sort of conduit to Melville's formative engagements with literature that we might be inclined to hope for, his text "contains only one marking" other than his name. And Melville's only annotation is ultimately linked to meteorology: the leading scientific concern at the Academy in 1830 (Gilman 307).

Science at the Albany Academy

As space was reallocated for the new Fourth Department in 1829, rooms in the Basement were "consigned for a lecture room and laboratory" (*Henry Collection* Box 28, Folder 1). And a "Descriptive Catalogue of Philosophical Apparatus Purchased for the Albany Academy" suggests that Melville would have found a remarkable collection. There are 32 entries for purchases made in 1830 alone, many of which, as I have explained, were funded by donations. In fact, the Academy's collection actually seems to have "compared favorably with collections at leading American colleges." (West

Point had the best lab, by far, and the articles in Henry's "Catalogue" were similar). The quality of the collection can be explained by Henry and Beck's research, the school's atypical tracks for mathematics and science, and the fact that the courses were at a college level. Henry modeled the new laboratory after Benjamin Silliman's arrangement at Yale (*Henry Papers* 304). But the Academy's holdings were impressive years before these changes. Asa Fitch offered an especially helpful account just before school's expansion: the cabinet had an extensive collection of minerals, insects, and other "specimens of the soils." "The Laboratory would contain a large audience." "Our Chemical apparatus could not compare with what is here." And the "Library contains a considerable number of books" (*Henry Papers* 182). By the start of 1832 the worth of the Academy's "Library, Philosophical and Chemical Apparatus" was listed at $1,550 (*Henry Papers* 398).

The curriculum included Henry's "Lectures on Chemistry and Physics," which were open to the public. These "lectures and experiments" were an important part of the school's traditions and were very well attended. In fact, these lectures, "being held in the evening, were favored with the presence of young ladies as well as young gentlemen." They required "tickets of admission." Families received discounts. And chemistry students got in free. (See Henry Collection Box 7, Folder 7; Albany Academy 4; Leyda 46; Henry Papers 50.) These lectures would have been engaging and dynamic. Henry, as I have suggested, possessed a remarkable sense of how to please a crowd (Moyer 56). Notes from his first year at Princeton, for example, describe him stretching wire across campus and then using a battery to ring church bells several miles away (Weiner 1100). And Henry's showmanship was clearly developed in Albany, where his lectures were reportedly both memorable and inspiring.

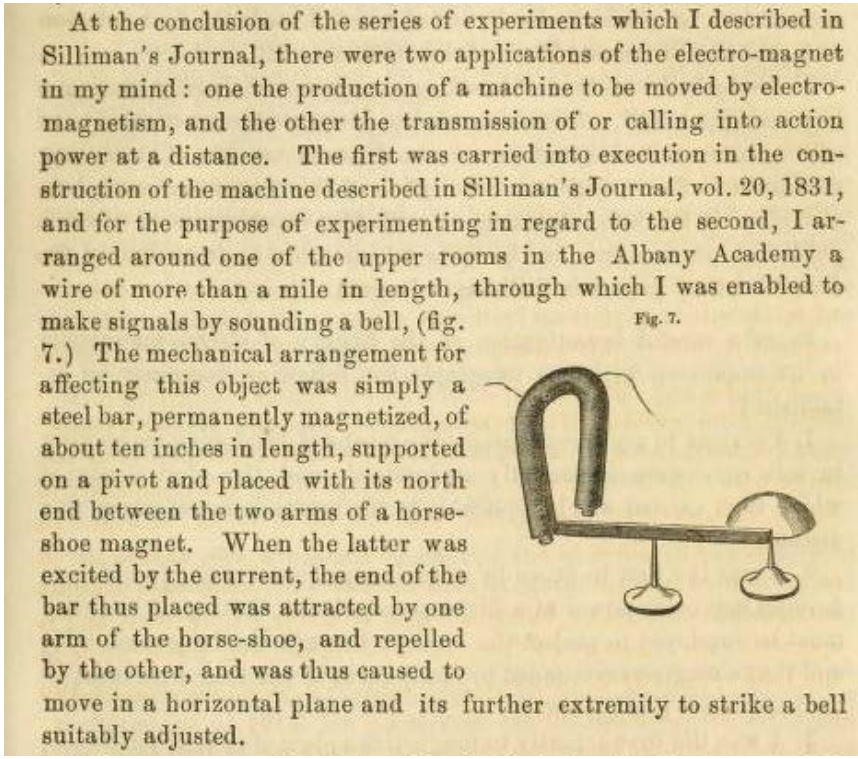
Patrick Smyth, who was in the Fourth Department with Melville, sent a note to this effect as part of Henry's memorial in 1897:

> Henry alternated with Dr. [Lewis] Beck in weekly lectures on chemistry in the laboratory of the academy. On one occasion he exemplified the action of electricity on locomotion; as I now recollect, a small galvanic battery of alternate sheets of zinc and copper wire . . . was connected with the car on a circular railroad of diminutive dimensions. It was a perfect success, and all were amazed at the wonderful power transmitted. I believe it was the first application of electrical power to locomotion; at least among the pupils it was so understood (*Henry Collection* Box 27, Folder18).

Smyth added in a second letter: "what I recall, which is indelibly impressed upon my memory," is that Henry "illustrated the energy of electricity and magnetism, by propelling a car upon a miniature circular railroad, to the amazement and delight of the pupils" (*Henry Collection* Box 27, Folder18). Melville

was only twelve when these lectures and demonstrations took place. But the student who remembered the railroad, Patrick Smyth, was only ten (Albany Academy Trustees). And Smyth was tellingly able to reconstruct how the device had worked, fifty years after the fact. So Henry's lectures could have also left a lasting impression on Melville.

The open question, of course, is whether Melville would have seen—or comprehended—Henry's early "telegraph." (It seems safe to suggest that would have been quite memorable.) Accounts from Princeton the very next year indicate that the telegraph served as the crowning example of Henry's dramatic showmanship. One student offers, for example: "I most distinctly recall, for I was strongly impressed by the remark, how [Henry] said with some emphasis, 'there, young gentleman, you have just seen the germ of a telegraph, which,



At the conclusion of the series of experiments which I described in Silliman's Journal, there were two applications of the electro-magnet in my mind: one the production of a machine to be moved by electro-magnetism, and the other the transmission of or calling into action power at a distance. The first was carried into execution in the construction of the machine described in Silliman's Journal, vol. 20, 1831, and for the purpose of experimenting in regard to the second, I arranged around one of the upper rooms in the Albany Academy a wire of more than a mile in length, through which I was enabled to make signals by sounding a bell, (fig. 7.) The mechanical arrangement for affecting this object was simply a steel bar, permanently magnetized, of about ten inches in length, supported on a pivot and placed with its north end between the two arms of a horse-shoe magnet. When the latter was excited by the current, the end of the bar thus placed was attracted by one arm of the horse-shoe, and repelled by the other, and was thus caused to move in a horizontal plane and its further extremity to strike a bell suitably adjusted.

Fig. 7.

Fig. 5. This frequently used image of Henry's prototype of the telegraph machine can be found in the *Annual Report of the Board of Regents of the Smithsonian Institution* in 1857, which offers Henry's response to Samuel Morse's failed attempt to gain a patent. The magnet was activated by a signal sent through the wire. Photograph courtesy of the Dibner Library, Smithsonian Institution.

by an easy system of signs, will carry information around the globe'" (*Henry Collection* Box 27, Folder18). The details about Henry's invention are both contested and unclear. But several reports indicate that he "consistently demonstrated this arrangement to his classes at Albany" and that his model had miles of wire that was "strung in successive loops" around the regularly-used assembly hall on the second floor. For demonstrations Henry even extended the wire into the basement laboratory to "dramatize" it further. So Henry's invention seems to have been very visible (Hochfelder; Henry 434; Moyer 69). One newspaper clipping from Henry's memorial even offers a memorable (but potentially mythical) account: Henry announced to the Academy's students that he had just "had a wonderful dream." He wanted them to witness it becoming "actuality." So he invited them down to the laboratory, where he assembled the original "telegraph machine" (*Henry Collection* Box 43, Folder 18). More precisely—as we learn from a prominent lawsuit—Henry constructed the mechanism. Then Morse found a way to make it turn a profit (Hochfelder).

For sorting out what Melville would have understood, of course, the legacy of Henry's transformative invention may be more appropriate. And here we can turn to the program for the Academy's "Semi-centennial Celebration" in 1863, which offers a window into the school's representation of this defining moment:

> The older students of the Academy in the years 1830, 1831, and 1832, and others who witnessed his experiments, which at that time excited so much interest in this city, will remember the long coils of wire which ran, circuit upon circuit, for more than a mile in length around one of the upper rooms in the Academy, for the purpose of illustrating the fact, that a galvanic current could be transmitted through its whole length, so as to excite a magnet at the farther end of the line, and then move a steel bar which struck a bell. This, in a scientific point of view, was the demonstration and accomplishment of all that was required for the magnetic telegraph. The science of the telegraph was here complete. (5)

In short: even if Melville did not see the telegraph himself, it would have been a significant part of his intellectual heritage, as it was for both the Academy and for the city. In the words of the Anniversary program: "let us not forget, that the click of the telegraph, which is heard from every joint of those mystic wires which now link together every city, and village, and post, and comp, and station, all over this continent, is but the echo of that little bell which first sounded in that upper room of the Academy" (5).

The "telegraph" was by no means the only major scientific work at the heart of the Academy's culture while Melville was enrolled. From 1825 to 1850, Albany was arguably the national center of work on meteorology (Fleming xxi,

ALBANY, N. Y., DECEMBER 16, 1899.

IN HONOR OF PROF. JOSEPH HENRY.

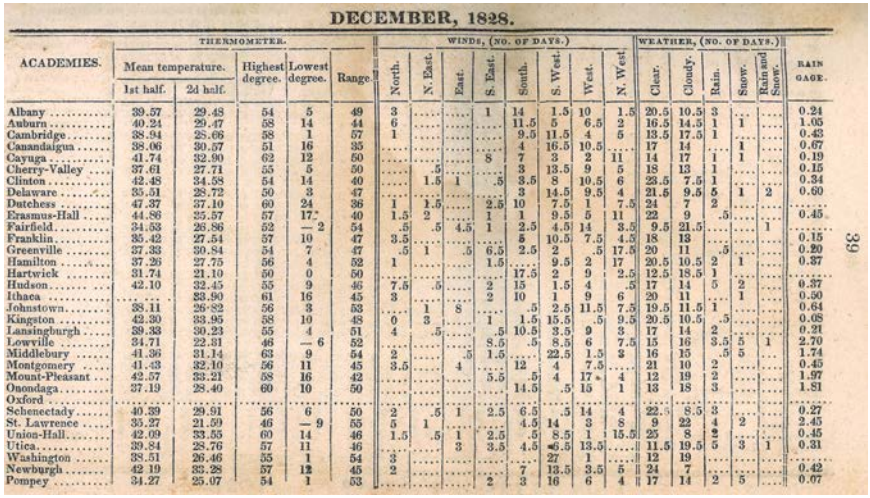
Centennial Anniversary of His Birth Celebrated in the Albany Academy.

The centennial anniversary of the birthday of Prof. Joseph Henry, LL. D., was observed fittingly on Saturday evening in the Albany academy, where the well known scientist made the discoveries in electricity that startled the world and proved of inestimable value to mankind. A large number of Albanians attended the meeting. Letters of regret were read from President McKinley and other prominent men, expressing in laudatory terms their appreciation of the worth of Prof. Henry.

The exercises were opened shortly after 8 o'clock by the Hon. Verplanck Colvin, president of the Albany Institute, who made a few introductory remarks. Secretary Frederick J. H. Merrill then read letters of regret from President McKinley, Governor Roosevelt, Congressman Glynn, Dr. Stephen P. Bangley, secretary of the Smithsonian Institute; Rear Admiral Francis J. Higginson, U. S. N., chairman of the lighthouse board; Charles E. West of Brooklyn and John V. L. Pruyn of New York.

James F. McElroy gave an interesting review of the scientific achievements of Prof. Henry, whom he characterized as "the founder of modern electrical science." The Rev. William Force Whitaker showed the baptismal register of the First Presbyterian church containing the record of the birth of Joseph Henry. Alexander Selkirk related some interesting anecdotes of Henry's early life and the Rev. Dr. Walton W. Battershall told of some of the personal traits of the scientist. Mr. James Ten Eyck, nephew of Dr. Philip Ten Eyck, one of Henry's co-workers, made some appropriate remarks and exhibited the historic bell which Henry used in demonstrating his invention of the electromagnetic telegraph.

Fig. 6. Henry's bell was also clearly part of Melville's family story. This image is from a newspaper clipping that was tucked into the pages of the "Albany Book" of photos kept by Peter's daughter, Catherine Gansevoort, who was one of Melville's most faithful supporters (Sealts 380). Photograph courtesy of the Gansevoort-Lansing Collection. Manuscripts and Archives Division. The New York Public Library. Astor, Lenox, and Tilden Foundations.



DECEMBER, 1828.

ACADEMIES.	THERMOMETER. Mean temperature. 1st half.	2d half.	Highest degree.	Lowest degree.	Range.	WINDS, (NO. OF DAYS.) North.	N. East.	East.	S. East.	South.	S. West.	West.	N. West	WEATHER, (NO. OF DAYS.) Clear.	Cloudy.	Rain.	Snow.	Rain and Snow.	RAIN GAGE.
Albany	39.57	29.48	54	5	49	3	....	....	1	14	1.5	10	1.5	20.5	10.5	3	...	....	0.24
Auburn	40.24	29.47	58	14	44	6	....	....	....	11.5	5	6.5	2	16.5	14.5	1	1	....	1.05
Cambridge	38.94	28.66	58	1	57	1	....	....	....	9.5	11.5	4	5	13.5	17.5	1	....	....	0.43
Canandaigua	38.06	30.57	51	16	35	....	....	....	....	4	16.5	10.5	....	17	14	....	1	....	0.67
Cayuga	41.74	32.90	62	12	50	....	....	....	8	7	3	2	11	14	17	1	1	....	0.19
Cherry-Valley	37.61	27.71	55	5	50	....	.5	....	....	3	13.5	9	5	18	13	1	....	....	0.15
Clinton	42.48	34.58	54	14	40	....	1.5	1	.5	3.5	8	10.5	6	23.5	7.5	1	....	....	0.34
Delaware	35.51	28.72	50	3	47	....	....	....	....	3	14.5	9.5	4	21.5	9.5	5	1	2	0.60
Dutchess	47.37	37.10	60	24	36	1	1.5	....	2.5	10	7.5	1	7.5	24	7	2	....	....	....
Erasmus-Hall	44.86	35.57	57	17	40	1.5	2	....	1	1	9.5	5	11	22	9	.5	....	....	0.45
Fairfield	34.53	26.86	52	— 2	54	.5	.5	4.5	1	2.5	4.5	14	3.5	9.5	21.5	....	....	1	....
Franklin	35.42	27.54	57	10	47	3.5	....	....	....	5	10.5	7.5	4.5	18	13	....	....	....	0.15
Greenville	37.33	30.84	54	7	47	.5	1	.5	6.5	2.5	2	.5	17.5	20	11	.5	....	....	0.20
Hamilton	37.26	27.75	56	4	52	1	....	....	1.5	....	9.5	2	17	20.5	10.5	2	1	....	0.37
Hartwick	31.74	21.10	50	0	50	....	....	....	....	17.5	2	9	2.5	12.5	18.5	1	....	....	....
Hudson	42.10	32.45	55	9	46	7.5	.5	....	2	15	1.5	4	.5	17	14	5	2	....	0.37
Ithaca	....	33.90	61	16	45	3	....	....	2	10	1	9	6	20	11	....	1	....	0.50
Johnstown	38.11	26.82	56	3	53	....	1	8	....	.5	2.5	11.5	7.5	19.5	11.5	1	....	....	0.64
Kingston	42.30	33.95	58	10	48	0	3	....	1	1.5	15.5	.5	9.5	20.5	10.5	.5	....	....	0.08
Lansingburgh	39.33	30.23	55	4	51	4	.5	....	.5	10.5	3.5	2	3	17	14	2	....	....	0.21
Lowville	34.71	22.31	46	— 6	52	....	....	....	8.5	.5	8.5	6	7.5	15	16	3.5	5	1	2.70
Middlebury	41.36	31.14	63	9	54	2	....	.5	1.5	....	22.5	1.5	3	16	15	.5	5	....	1.74
Montgomery	41.43	32.10	56	11	45	3.5	....	4	....	12	4	7.5	....	21	10	2	....	....	0.45
Mount-Pleasant	42.57	33.21	58	16	42	....	....	....	5.5	.5	4	17	4	12	19	2	....	....	1.97
Onondaga	37.19	28.40	60	10	50	....	....	....	....	14.5	.5	15	1	13	18	3	....	....	1.81
Oxford	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Schenectady	40.39	29.51	56	6	50	2	.5	1	2.5	6.5	.5	14	4	22.5	8.5	3	....	....	0.27
St. Lawrence	33.27	21.59	46	— 9	55	5	1	....	....	4.5	14	3	8	9	22	4	2	....	2.45
Union-Hall	42.09	33.55	60	14	46	1.5	.5	1	2.5	.5	8.5	1	15.5	25	8	2	....	....	0.45
Utica	39.84	28.76	57	11	46	....	....	3	3.5	4.5	6.5	13.5	....	11.5	19.5	5	3	1	0.31
Washington	38.51	26.46	55	1	54	3	....	....	....	....	27	1	....	12	19	....	....	....	....
Newburgh	42.19	33.28	57	12	45	2	....	....	....	7	13.5	3.5	5	24	7	....	....	....	0.42
Pompey	34.27	25.07	54	1	53	....	....	....	2	3	16	6	4	17	14	2	5	....	0.07

Fig. 7: This particular page from Beck and Henry's "Meteorological Data from Participating Academies" can be found in Pamphlet 13.2 of Joseph Henry's Library at the Smithsonian. Photograph courtesy of the Dibner Library, Smithsonian Institution.

9; *Henry Papers* xxvi, 106). Its program began when Simeon De Witt proposed that each Academy chartered by the State be furnished with a thermometer and a rain gauge. These were serious scientific devices, designed and supplied by the Board (Peter Gansevoort included), which prescribed rules for making, recording, and submitting observations. In fact, for over thirty years the Academies provided detailed accounts of temperature; precipitation; wind direction; cloud descriptions; and "every meteorological phenomenon that came under notice," from storms to the first annual appearance of flowers and frosts (Regents 30; Hough 766; *Henry Collection* Box 28, Folder 1). This data was sent to Albany from across the state, and Beck compiled and reported the results, along with Joseph Henry (Hough 768; Beck).

The "New York Academy System" offered unprecedented coverage. In fact, it was the very first large-scale weather system: then a term used to describe a group of observers collecting weather data, not large storms. The system was precise. It was technical. It was remarkably well-organized (Regents). And this was actually the largest weather system in the world until 1848, when Henry expanded its model to a national scale for the Smithsonian's almost identical "big data" project (Fleming 76; Hough 771). But this historical significance does not give a full sense of the importance of meteorology at the Academy when Melville was enrolled.

We gain some sense of the relationship between the Academy's students and its program when we turn to Henry's papers. There we find, for

example, the story of a rain gauge that was stolen from Principal Beck. The theft was more serious than it might sound, since this was government-issued equipment. And years later Henry sent Beck an anonymous letter that offered answers: "You may recollect the affair of your weather gauge," Henry opened, before offering that four of Melville's Fourth Department classmates—including Patrick Smyth—were the culprits. They "had a small gauge" and wanted to copy an "accurate scale." Unfortunately in the midst of that project, Beck arrived—and "being terrified" they sprinted off with his "apparatus" (Henry Collection Box 7, Folder 11). Their "terror" supports the Academy's reputation as oppressive and draconian at the same time, it seems, that the students went running to Henry. (His occasion for sending the note was that they were all finally safely "out of the Academy.") But more importantly, here we learn that Melville's classmates had their own meteorological devices, which they used for recreation. They knew how to work them. And they wanted results.

In general, Henry's lectures dealt with his cutting-edge work. Most anecdotes point in that direction, and we know that he was revising his chemistry lectures rather intensely, even writing to the editor of *The American Journal of Science,* Benjamin Silliman, for teaching advice while he was still in Albany (*Henry Collection* Box 7, Folder 9). In an essay on Henry as one of the first scholars truly committed to today's "teacher-scholar idea," Charles Weiner explains that Henry was often atypically focused on drawing students "into the process of discovery" (Weiner 1096–1100). He had them serve as assistants for experiments and demonstrations, operating complicated batteries or "pulling mightily" on rope to try to separate two magnets. And it was said that no graduate left the Academy "without a profound sense of the great benefit derived from the instructions of the professor, and a warm attachment to the man'" (Swartz 348–357; *Henry Collection* Box 30, Folder 6).

Future Encounters?

Melville was not able to formally study with Henry after 1831, but there were ample opportunities for interaction before Henry left for Princeton. First, in response to a "rising demand for better public schools," the Regents proposed that faculty give "brief courses of lectures" to the public. These lectures were seen as part of the tradition of popular enlightenment related to the Lyceum (Reingold 141). And they included Henry's Introduction to Chemistry in 1832 (*Henry Papers* 396, Moyer 54). Henry also used the Academy Park to conduct experiments just beyond the school's walls. He offered after-school "amusements and instruction" in memorable arenas like "balloon-flying." And here

"science" took on exciting forms, like "air-ships" soaked in turpentine that would catch on fire (Habegger 70).

Melville, in turn, committed himself to the intellectual life of the city at a young age. He made regular use of the libraries in Albany, along with his brother, Gansevoort, at a time when Henry was the Librarian for both the Institute and the Academy (Reingold 139; Gilman 91). Then he joined the Young Men's Association when he was still fifteen (Leyda 64). (Members were allegedly required to be older.) In short, Melville's combination of intellectual engagement, personal connections, and social maturity may have led him to continue to connect with Henry—or, at least, to cross paths with him—or to follow his work.

Interestingly enough, Joseph Henry would also have had reasons to continue to engage, starting with his own interest and investment in students who could not afford to enroll. Henry was "a poor boy," whose father died when he was young, and after a very basic education he had become a "shining star" in Albany's theater scene (Reingold 137). But avid reading led him to develop a deep passion for science. And he enrolled in the Academy when he was twenty-two, which was possible only because of a generous offer from Beck (Reingold 137). Perhaps not surprisingly, Henry went on to strongly support the dissemination of knowledge and the improvement of "common" or free public schools. He wrote, for example, that the "diffusion" of "useful knowledge" among citizens "is the principal, if not the only means of promoting individual happiness as well as material prosperity" (*Henry Papers* 350). And his "Philosophy of Education" insisted that "common school or elementary education is the basis on which the superstructure of the plan of true progress should be established" (*Henry Papers* 350). In fact, at a time when only half the city's children received any schooling at all, Henry was certain that "every individual should have the opportunity offered of him of his much mental culture as he is capable of perceiving or desirous of acquiring" ("Philosophy of Education" 79; *Henry Papers* 240). This democratic spirit is what led Henry to the Smithsonian, amidst other more attractive offers. He was genuinely drawn to the idea of an institution that focused on the "diffusion of knowledge" (Weiner 1100).

Melville and Henry also may have crossed paths on one of Melville's trips to Washington. The first was in February 1847, just one month after Henry's start at the Smithsonian. This timing is intriguing, and Henry's new Institution—along with his political connections—would have been very appealing. Melville certainly did some sightseeing in Washington. He and Allan went to an art exhibition and saw Congress in session. But the purpose of the trip was for Melville to obtain a position in the Treasury Department. And instead of simply remaining content with "several strong letters" from "prominent

persons" influential to "the seat of government," he asked Peter to help him get in touch with Senator John Dix. Peter did write, and Dix tellingly spent an evening with Henry the next week. So interaction with Henry seems possible (*Correspondence* 81; Leyda 234; Parker 484–486). Melville may also have met Henry when he returned to Washington in 1861, attempting to secure a post as a consul. Melville worked atypically hard at making connections, walking the Mall, attending a reception at the White House (where he shook Lincoln's hand), exploring the Capitol building, and even visiting the Washington Monument—one block from Henry's home in the original Smithsonian "Castle" (*Correspondence* 365–367, Robertson-Lorant 428).

Melville and Henry were also invited to be on stage together as honored "dignitaries" for the Academy's fiftieth anniversary in 1863. In fact, when we turn to the official program for the celebration, we learn that "Herman Melville, whose reputation as an author has honored the Academy, world-wide," was "warmly welcomed" (11). Unfortunately "official business" appears to have kept Henry in Washington (*Henry Papers* 233). Even so, it seems as if Melville and Henry did, in fact, cross paths for this event. They were members of a small committee that had a planning meeting in April, called by Peter Gansevoort, then President of the Board of Trustees. This encounter is an especially fitting conclusion. When Peter sent Melville his official invitation to the event, his letter tellingly highlights the importance of "Science" that I have worked to build: "permit me to indulge the hope, that you will shew your gratitude to the Academy & your appreciation of the services it has rendered the cause of Science by uniting in the celebration & favoring us with an expression of your feeling" (Albany Academy 4, 48; *Correspondence* 689).

Ultimately it is impossible to evaluate Henry's influence on Melville, but it seems equally difficult to maintain that Melville's time at the Academy "could not have added much" to his "scientific study" (Hillway 412). Joseph Henry was a remarkable teacher and scientist. His prominence seems especially important in light of both Melville's "surprising" success in Henry's class and the multitude of ways that the Academy's two eventual "dignitaries" were institutionally and socially connected. But this story of Melville and Henry is also a story about Albany. Both figures found themselves in an environment where science and technology were shaped, and where those practices, in turn, shaped almost everything, from education to transportation and even political systems.

I trace a number of the ways that Melville draws on scientific narratives as conceptual resources for his fiction in my current project, *Melville's Ontology*.[15]

But it is impossible to summarize the ways that Melville's milieu affected his writing in the space of such a brief conclusion. Instead I would like to offer three flash points that begin to suggest the multitude of ways that this new "Melville" might give us different ways to respond to his work.

Melville's time at the Academy coincided with its groundbreaking meteorological project, and his interest in work on the weather is undeniable. As Hugh Crawford, Samuel Otter, and Derek Woods have noted in recent years, in "The Chart," Melville offers a footnote to Matthew Fontaine Maury's work at the National Observatory, which was published in 1851, just months before *Moby-Dick*. So Melville was certainly considering the weather when he described the white whale as a "swarm" of "subtle agencies" "made visible," much like electromagnetic forces or wind. In fact, Melville's Ahab declares that if the "wind" just "had a body" all his problems could be solved: "all the things that most exasperate and outrage mortal man, all these things are bodiless, but only bodiless as objects, not as agents" (*Moby-Dick* 420). Here a deeper sense of Melville's long-standing engagement with attempts to chart these "agents" without bodies (like "wind" and "climate") would help bolster both work on Melville's engagements with these charts and on related considerations of agents that exceed the limits of form.

Melville also draws on topics in chemistry that were prominently discussed at the Academy. For example, "capillary attraction" was the subject of one of Henry's public lectures (*Henry Papers* 78; *Henry Collection* Box 30, Folder 11). And Melville's reference to this surprisingly technical topic might give us insight into moments like the otherwise inexplicable opening and closing of *White-Jacket*, when shipmates were materially connected by "capillary attraction" (4), framed as exchanging their atoms. This chemical construction returns at the end of the text, when even White-Jacket's "soul" was "made up of atoms" (393). And identifying and clarifying these textual moments with the help of related biographical connections could help ground and develop readings by critics like Hugh Crawford and David Alworth, who claim that Melville anticipates Bruno Latour. For Alworth both thinkers "endeavor to grasp" "the mystery of collectivity," imagining a "social" that "comprises both humans and nonhumans" (252, 257). But the "Melville" I have offered pressures Alworth's sense of scale by engaging with "subtle agencies" like "atoms" and "elements" instead of "garments," "artifacts," and "tools" (*Moby-Dick* 110; Alworth 255, 256).

Finally, in considering electromagnetism we can turn to discussions of the telegraph by Peter West and Thomas Zlatic, both of whom imagine the power of the telegraph in terms of abstract "information" that is also "disembodied." But locating Melville at Henry's early demonstrations should revise readings that imagine Melville's response to the telegraph solely in terms of abstract information, or separate from its conditions of production.

Far more could be said about Melville and Henry in Albany. We might start with *Moby-Dick*'s "The Needle," where Ahab almost perfectly mirrors one of Henry's experiments in the Academy's Park (*Moby-Dick* 389; *Henry Papers* 291, 336). And this example suggests the multitude of ways that this different engagement with Melville's education might give us new ways to respond to his work. It is surprising that—despite the volume of recent work on both Melville's life and his engagement with "science" (broadly construed)—this narrative has not been readily available for critics. And this omission raises questions that can only be posed here: what does it mean to have to "recover" Melville's background in science and mathematics, at a moment when STEM fields are allegedly dominant and when STEM rhetoric is arguably ubiquitous? These questions will never yield definitive answers, but in a moment that critics have described as a "nonhuman," "inhuman," or even a "materialist turn"—a moment when critics are producing collections on both "Melville and Material" and "Melville and the Materialist Turn"—it is clearly time to reintegrate this portion of Melville's biography and to bring Melville's education in science and mathematics to the table as a resource for thinking seriously about both Melville and his art.[16] This shift in the way that we conceptualize Melville's life might even be seen as offering an unexpectedly literal ground for Christopher Castiglia's recent observation that "every generation needs a new 'Melville' suited to that generation's assumptions and needs"—and that a "sense of possibility" might enable us to "discover a Melville for our time" (220, 231).[17]

Notes

[1] Many thanks are due, especially to Kathleen Dorman at the Smithsonian, who helped me find materials I thought were lost; Kirsten van der Veen and Lilla Vekerdy at the Dibner Library, which supported my work with Henry's papers and his personal library; Timothy Marr, who encouraged me to think seriously about Melville's biography; Donald Pease, whose work has been almost as inspirational as his feedback; and the incredibly helpful readers and editors at *Leviathan*.

[2] This connection was mentioned, very recently, in Turpin (2015).

[3] This six-inch piece of cable can be viewed in the Melville Room of the Berkshire Athenaeum in Pittsfield, Massachusetts. Their collection notes describe it as his favorite paperweight.

[4] This account is drawn from papers in the *Joseph Henry Collection* in the Smithsonian Institution Archives, which are cited in-line by box and folder; here *Henry Collection* Box 28, Folder 11; Box 7 Folder 11; Box 28, Folder 9.

[5] For the story of these awards—and the public examinations that prompted them—see Gilman 56; *Henry Papers* 24–26, 189; Hawley.

[6] Here it is important to note Titus's six-page "Herman Melville at the Albany Academy," which was an inspiration for this essay. Unfortunately Titus's analysis is predicated on a problematic elision of Melville's time at the Columbia Grammar School.

[7] See Snow 169; Pease 113–117; and Castiglia 220–22, along with Hillway's "Melville and Nineteenth-Century Science" (1944), "Melville's Geological Knowledge" (1949), and "Melville as Critic of Science" (1950).

[8] *Moby Dick* 340, 141. For more on *Moby-Dick*, Henry, and electromagnetism, see, especially, *Moby-Dick* 19, 137, 281 alongside *Henry Papers* 316, 335, 396.

[9] See *Moby-Dick* 389 alongside *Henry Papers* 1.291, 335–336.

[10] See *White-Jacket* 4, 392–394 alongside *Henry Collection* Box 3, Folder 11, and *Henry Papers* 78.

[11] See *Published Poems* 111; Henry 2; *Henry Collection* Box 7, Folder 9.

[12] See *Clarel* 4.34.51–53, along with Melville's other mentions of the telegraph: *Typee* 105; *Mardi* 538.

[13] We cannot ultimately be sure of whether Melville was enrolled in the Fourth Department at all, despite frequent suggestions to the contrary (Titus 4–7; Leyda 45). Melville's enrollment was for "English Grammar, Arithmetic, and Geography," which was common for students of all ages. But when Melville's younger brother Allan matriculated less than a year later, his enrollment records placed him in the "Fourth Department." Whatever Melville's formal status was, this was not a system that worked in terms of the rigid grade levels we might imagine today. See Albany Academy; Albany Academy Trustees; Academy *Statutes* 4, 16; Academy *Summary* 54.

[14] The standard narrative is that Herman was "not distinguished in mathematics," but he developed a "love of English composition" that was identified by West. But the source of this oft-quoted comment is one line from a short biographical piece from 1891. I am wary of placing too much weight on a brief recollection of something half a century into West's past, years after Melville had become a famous author (Smith 6).

[15] The argument of *Melville's Ontology* is that Melville draws on a set of scientific narratives as conceptual resources that enabled him to think differently about the idea of the "person." This approach notably decouples science and technology from the economic ends that might prompt concern in this essay.

[16] For the "nonhuman turn," see Sanborn or Grusin. For the "inhuman turn," see Luciano and Chen.

[17] To some degree this invocation is at odds with Castiglia's articulation of an idealism that could stand as an alternative to "drowning in the whirlpool of proliferating 'turns.'" But I am suggesting, in part, that this "materialist turn" captures the sense of possibility that Castiglia hopes for, here and in "Critiquiness."

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