

As if Blackbirds Could Shape Scientists: Wallace Stevens Takes a Seat in the Classroom of Interdisciplinary Science

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STUDENTS WHO WILL BECOME scientists spend scores of hours preparing to make sense of the world. Their capacity to achieve notable discoveries, to decipher reality, will depend upon their method. And that method will depend upon their attitude toward language—seeing language not just as a means of communication, but as a thinking tool, a non-passive means of representing reality and enlarging their apprehension of it. Just how well young scientists will fare in this “face-to-face confrontation between language and nature” (Leonard and Wharton 87) will depend upon their *awareness of limits*—the limits of language, of perception, of thought.¹ But cultivating such an awareness is like farming foreign soil in most classrooms of science.

In this essay, my attempt will be to describe a method I have used to teach graduate-level scientists-in-training, drawing upon the works of Wallace Stevens to show how the humanities can catalyze creative excellence in scientific discovery and education. My approach hinges upon bringing students within reach of Stevens, not via a specific offering on Stevens or even a general literature course, but by having him unexpectedly enter the classroom of interdisciplinary science. Here I will sketch out some of the touchpoints that I have created between students of science and Stevens. These touchpoints are not points of contact with Stevens-in-isolation, but rather an encountering of his ideas and images intertextualized with those of other thinkers—encounters that have proven most useful in my classroom to inspire fresh thinking and to provoke solid reappraisal of the scientific method as an “all-powerful” method of inquiry. Provoked by Stevens, students are encouraged to escape their ties to the one-dimensionality of analytical problem-solving; they are challenged to emerge as hyphenated “imagino-analytical” discoverers. By embracing a new idea—*the scientific method is a method limited by language*—students who will become scientists are armed with an awareness of the primacy of language and how it impacts their processes of perception and thought, influencing how they will express their thoughts and feelings about Nature and themselves. Finally, classroom encounters with

Stevens's aesthetic are developed to help students find satisfaction in the continual revision of their own beliefs—a satisfaction strong enough to persist despite falling short of any final Truth.

ON THE METHOD OF SCIENCE: IMPOSING OR DISCOVERING?

Students of science do not know Stevens. Then how to break the ice? An approach I have found to be effective is to make an aphoristic introduction to Stevens. The utterance I put forth as the initial touchpoint, the first portal to Stevens, is from "Notes Toward a Supreme Fiction": "But to impose is not / To discover" (*CPP* 349). This slender introduction provokes a surge of student interest, stimulating rich classroom discussion and ongoing introspection. The statement quickly becomes integrated into the lexicon students use to describe not only their own scientific acts, but the acts of their colleagues. Henceforth, Stevens's aphorism shapes their process of critiquing every scientific manuscript. "Just how much discovering and how much imposing took place here?" becomes the litmus test for each published work. Scientific experiments are notoriously prone to imposing. Each scientific manuscript—no matter how highly revered—is no more than what I.A. Richards termed "a view formed under special circumstances" ("The Secret" 253). This is because each investigator selects the special circumstances—the study population, the exposures of interest, and the measured outcomes—that come to be known as their experiment. Picasso said: "Art is a lie that makes us realize truth" (315). After some soul-searching, my students concede that every scientific manuscript (including their own) is a "lie," falling short of Truth (with a capital T). Later, as we develop Stevens's idea of a supreme fiction, students will see each scientific manuscript as just one more step toward a deeper, yet always incomplete, understanding. They become less anxious with the incompleteness of their thoughts, no longer underestimating the necessity of their imaginings. Stevens wrote: "I want man's imagination to be completely adequate in the face of reality" (*L* 790). My students are invited to visualize the imagination of the scientist "pressing back" against the pressure of a scientific "reality" (*CPP* 665)—that proliferating collection of "facts" that populates today's prevailing theories.

I draw upon Stevens's astute comprehension of the tension between imposing and discovering to provoke my students to reflect upon their own epistemic philosophy. Stevens places great importance on first-hand experiences. He sees reality, rather than our systematized beliefs, as the critical starting point. Stevens's stance echoes that of Alfred North Whitehead, who praised the life of his intellectual hero William James as a "protest against the dismissal of experience in the interest of system"; "above all he assembled" (3). For many students, "*Above all, assemble*" becomes a guiding maxim—steering themselves

away from starting their philosophy with a systematization of previous beliefs, advocating for a strengthening of their sensitivity to the ideas of the present, their own observations, rather than the all-too-stable systems of thought already embraced by their most seasoned colleagues.

As my students come to embrace the idea that imposing and discovering represent two very different methods of meaning-making, they turn inward to plot their escape from the dogmatic, examining their own possible “modes of advance” (Whitehead 57)—the discovering of novel patterns or the gathering of details within already conceived patterns. The students are ready to consider closely the lines from “Conversation with Three Women of New England”:

The mode of the person becomes the mode of the world,
For that person, and, sometimes, for the world itself.

.....
It follows that to change modes is to change the world.
(CPP 470)

With this introduction to Stevens complete, the students and I will experience together a succession of exposures to Stevens intended to provoke the continual “disorientation-reorientation” that is the hallmark of transformative change.² The attitude of the classroom, not surprisingly, is one of close attention, as the students and I understand that, if we are receptive, these provocations can shape our own “modes of advance”—challenging us to change our capacity “to change the world.”

ON THE PRIMACY OF LANGUAGE: MAKING SENSE OF A WORLD OF WORDS

In his poem “Description Without Place,” Stevens wrote, “It is a world of words to the end of it, / In which nothing solid is its solid self” (CPP 301). So too did the general semanticist Wendell Johnson write about the challenge of making sense of a world of words: “the worlds we manage to get inside our heads are mostly worlds of words... And so it is that in these worlds of words inside our heads we hold ourselves captive...[W]e take our words to be reality, and by so much we lose contact with the world outside” (71). Students begin to realize that *standing in between* them and the scientific problems they are so passionately trying to unriddle are the words used to describe or categorize those problems. For most students, this circumstance of *in-betweenness* has never before occurred to them.

Neither have they given much attention to the idea that language is never neutral. Language limits what we can perceive, what we can express. “Progress in any aspect is a movement through changes of terminology,” wrote Stevens

in his *Adagia* (CPP 900). Here, I intertextualize the thought of Susanne Langer and Hans-Georg Gadamer. “[O]ur primary world of reality is a verbal one,” wrote Langer in *Philosophy in a New Key* (126). Langer’s contention is that we should not accept *communication* as the primary reason for seeking language acuity. First and foremost, language is a tool for *representation*, for creatively making sense of the world. In *Truth and Method*, Gadamer concluded: “But it is language which really opens up the whole of our attitude to the world, and in this whole of language, appearances find their legitimacy just as much as does science... Whoever has language ‘has’ the world” (407, 411).

New gold has been struck in the minds of my students. Their method—the scientific method—is *limited by language*. Cultivating an attitude of precision with language becomes the aim of all who aim to “have” the world. And making sense of a “world of words” will require an overhaul of their skill set. Inspired by Stevens, students are freshly motivated to explore new territory, looking to deepen their relations with language at every turn. My students discover the rich prospect of making new words—the process of *neologism*. They come to see neologism as a vital act of scholarship that can directly address a major obstacle to scientific advance: *Our category-driven knowledge of Self and World is scripted using someone else’s words*. We rely on someone else’s language—words borrowed—to describe our unique difficulties, our process of navigating them. An attitude of precision with language also means a preparedness *to remove*, to cut away from our vocabulary, words that might interfere with our seeing, words like “know” that can serve as a stop sign for further critical inquiry. Here, I offer students a qualifying perspective on just how easy it will be to cultivate exactitude with language—provoking them with T.S. Eliot’s proposition in “East Coker” that, regardless of our preparation, we are inarticulate and on a collision course with failure (188–89). To soothe the sting of Eliot, the students and I turn to “Thirteen Ways of Looking at a Blackbird,” a poem in which Stevens seems to be sending a more uplifting message: Language places at our disposal a multitude of possibilities as we attempt each representation of Nature. As our discussions close, the students land safely, nested in a new attitude: Exactitude with language will be an essential tool for navigating Nature—confronting both the “pom-pom-pom” of the expected and the “clickety-clack” of the unexpected (L 485).

ON PERCEPTION: REALITY AS REALITY SEEN

The notion that heightened perception is an important attribute of the discoverer is not a new one. Leonardo da Vinci claimed there are four keys to developing one’s capacity for creative work: mastering the art of science; mastering the science of art; recognizing all things as connected; and *learning how to see what others cannot* (Buzan 8). Yet most students of science are not schooled in the art of perception

or its limits. Since grade school, teachers have been harping on them that, to become scientific, one needs to develop an attitude of *objectivity*. Drawn to this mode of thinking, students see their use of the scientific method as an all-powerful act capable of flawlessly capturing “the single sense” of each thing (object) encountered. It follows that they hold a view of perception as naked, unencumbered by contamination of any sort.

Using Stevens, I try to chip away at this monument of misperception, at the illusion of naked, “unmediated perception” (Regueiro 60). First, we consider this passage from “Notes Toward a Supreme Fiction”:

You must become an ignorant man again
And see the sun again with an ignorant eye
And see it clearly in the idea of it.

(CPP 329)

Each of us is the product of our previous training. Expertise, therefore, can handicap a scientist’s perceptual acumen. Here, my students dwell on the initially uncomfortable idea that an expert must sometimes forget her expertise, intentionally breaking free to see farther. “It is never the thing but the version of the thing,” wrote Stevens (CPP 292). The students now ready themselves for a life engaged in *unlearning*—embracing the possibility that what they “know” can be a greater obstacle to them than what they don’t know. Their change is palpable as they develop a more nuanced relationship with what it means to be “ignorant.”

The next move I make to uncover the limits and possibilities of perception is to challenge students to see their method as a series of iterative *subjective* acts—to become aware that *subjectivity*, not *objectivity*, dominates their process of meaning making. This advance leads to a deeper exploration of what is subjectivity, which includes forays into Ermanno Bencivenga’s *The Discipline of Subjectivity* and Thomas Nagel’s *The View from Nowhere*.

Eventually, we return to Stevens for clarity. Stevens conceptualized a division of the perceptual moment—“split[ting] the act of perception in half, between the sensory moment of contact with otherness and the subsequent moment of interpretative experience” (Ackerman 81) that he termed “the moment after” (CPP 857). Stevens saw experience, not as a mass of raw sense data, but as interpretative. For Stevens, holding this notion holds double benefit. It triggers desire for the moment *after* (the piece of World taken) and also for the moment *before* (what World might really be like), a possibility expressed in “Thirteen Ways of Looking at a Blackbird”:

I do not know which to prefer,
The beauty of inflections
Or the beauty of innuendoes,
The blackbird whistling
Or just after.

(CPP 75)

“What we see is not an external world but an image of it and hence an internal world,” Stevens wrote (CPP 857). Reality becomes that part of reality that impresses us. The students have come face-to-face with non-naked perception—Stevens’s “the moment after”. They are now primed to explore the murky mix of sense data and personal bias that the physicist David Bohm called “net presentation” (55). Not reality, but reality as seen.³

ON THE PROCESS OF THOUGHT: NOTHING IS FINAL

It is not easy to unchain students from standard thinking about scientific thought: Science, in the main, is analytical. Here I count on Stevens to counterbalance conventional science education’s urge purely to promote the analytical. “It is the *mundo* of the imagination in which the imaginative man delights and not the gaunt world of the reason” (CPP 679). As a means of strengthening students’ grasp of the value of imagination, students are assigned to read Stevens’s essay “Imagination as Value.” Students are drawn to the idea of the imagination that Stevens develops. “We have it (imagination) because we do not have enough without it” (CPP 735). “[I]magination is the power that enables us to perceive the normal in the abnormal, the opposite of chaos in chaos” (CPP 737). “The truth seems to be that we live in concepts of the imagination before the reason has established them. If this is true, then reason is simply the methodizer of the imagination” (CPP 738). To Stevens, the power and radiance of *imagination methodized by reason* can stir each of us as we consider “that the chief problems of any artist, as of any man, are the problems of the normal and that he needs, in order to solve them, everything that the imagination has to give” (CPP 739). Here Stevens can be productively paired with the thought of the psychoanalyst Rollo May, “*Ecstasy* is the accurate term for the intensity of consciousness that occurs in the creative act ... It may well be that reason works best in the state of ecstasy” (42–43). This launches my students and me into an energetic exploration of what possibilities an ecstasy-reason-imagination nexus could hold for a skillful discoverer.

Provoked by these discussions, students begin to see themselves navigating a larger realm—that of a reality-imagination continuum. With their belief in the value of the imagination more securely intact and their awareness

of the tension between imposing and discovering sharpened, the quality of my students' navigating—the quality of their thinking—now depends on what else is inside their navigational toolbox: an appreciation for the importance of questions as benchmarks of scientific progress; the ability to sidestep the myth of the single solution; a philosophy of process and a belief in a supreme fiction. Here I find it profitable to utilize Stevens in chorus with other thinkers to open up dialogue concerning these tools.

In "The Man on the Dump," Stevens creates a striking image: A poet sitting amidst a pile of her own images and descriptions that have become irrelevant. This image is not foreign to practitioners of science. Every scientist must come to realize that her brilliant new idea, revered today, will someday be thrown on the scrapheap of worn-out ideas. But lying there discarded, will her idea be recognized for its beauty, its value as a stepping stone to a richer understanding? The answer to this question will be a resounding "yes" if the idea has moved others *to ask and then answer a richer set of questions*. The astrophysicist Sir Arthur Eddington stated: "Progress is marked not so much by the problems we are able to solve as by the questions we are enabled to ask" (qtd. in Pirie 211). The biochemist N.W. Pirie took the notion one step further: "Clearly the process of formulating a question has a great psychological effect on the questioner; it focuses his attention on *what he thinks he wants to know*" (211; emphasis added). The most prized products of research are the new questions that come, *because questions change the questioner*. Progress, then, is judged not by our answers, our "facts", but rather by the quality of the questions we ask.

Reading "The Man on the Dump" prompts students to temper their "blessed rage for order" with a counterbalancing energy that seeks to avoid fixity (CPP 106). Research is a process, not a thing. Any newly ordered reality is quickly subject to reordering—a mental remnant of a relentless march, the discovery process. In the final line of the poem, Stevens eloquently beseeches us to abandon the idea of any single, immutable truth: "Where was it one first heard of the truth? The the" (CPP 186). I ask my students: "Will your imagination be completely adequate to side-step *the myth of the single solution*—"The the"? Are you ready to take up the task of perpetual attunement?" All progress is rooted in change. In the words of Stevens: *It Must Change* (CPP 336). For progress to occur, every scientist's big idea—the one that she holds now with so much conviction—must find its way, like Stevens's poetic images, to the dump.

The notion that developing a philosophy of process might strengthen thought is surprisingly unfamiliar to students of science. Their thinking is mainly of "facts," of things, not process. In my classroom, students are introduced to the thought of William James, that what "really *exists* is not things made but things in the making" (577). And then Stevens appears with an eye-opening thought that all scientists-in-training should encounter: *All experience is a supreme fiction*.

Each of us can strive for a personal, subjective approximation of World, but Truth is never reached. Seeing the world *the moment after* means that World “has become an image in the mind” (CPP 857), a version of reality that depends on the subject’s method. By seeing each moment as a moment of *poiesis*, a moment of making rather than passive acquisition, our experience is made richer. To Stevens, the choice is ours:

The prologues are over. It is a question, now,
Of final belief. So, say that final belief
Must be in a fiction. It is time to choose.
(CPP 226)

Reality is “continually, but discontinuously, rediscovered” (Leonard and Wharton 100). Students still clinging to the illusion that there is such a thing as a final word—“the definitive study”—in any scientific domain are given the opportunity to consider the opposite. “Nothing is final, he chants. No man shall see the end,” writes Stevens in “Like Decorations” (CPP 121). Within the realm of any process philosophy, it is unfinishedness and incompleteness that prevail.

ON THE FEELING OF SCIENCE: RESEARCHING BY RABBIT-LIGHT

What does a life in science *feel* like? An exhilarating pursuit of truths? Or is science a vocation blessed with only sporadic gratification, yielding “lumpy rewards”? Albert Einstein spoke of the critical importance of finding “the right problem”⁴—one that is meaningful enough that the worker will not throw in the towel when the researching reaches an oppressive degree of difficulty. Here I recruit Stevens to inspire young scientists demoralized by drab pursuit to keep them moving forward along a path of discovery. I call on Stevens’s remarkable ability to express the idea and image of “centrality” (Leonard and Wharton 114). Achieving a sense of centrality is one of the necessary attributes of the scientist who must fool herself into believing that she is the one who is uniquely suited for solving a problem that no one before her has been able to solve.

To develop the concept of centrality, I read aloud the Stevens poem “A Rabbit as King of the Ghosts.” After we finish listening, I distribute a printed copy of the poem and invite students to produce marginalia that capture what they are feeling, locating the parts that provoke them to reexamine a life in science.

This poem resonates strongly with students. I challenge them to consider the poem’s possible value as a metaphor for exploring the scientist at work. Is Stevens’s rabbit the scientist trying to fool himself into believing that he and he alone will overcome the elusive problem—solving the problem that all those giants

with shoulders who came before could not solve? Does the monument of cat (*CPP* 190) represent the big black box of Nature Unknown, which the scientist must attempt to penetrate with his own narrow, dimly lit angle of vision? Is the key to sustained renewal—to keeping scientists engaged in the failure-riddled venture that is discovery—that he must reimagine the research question as intended for him alone, perfectly matched to the unique skill set he has so heroically struggled to acquire?

Invariably, much of the subsequent discussion focuses on these lines:

And to feel that the light is a rabbit-light,
In which everything is meant for you
And nothing need be explained ...
(*CPP* 190)

For the scientist, this is an ideal: to feel the light of a question as *your* question, as rabbit-light “In which everything is meant for you” (*CPP* 190).

At this point, I often consider Stevens with Friedrich Nietzsche to create an image of the scientist at risk of becoming “a gloomy hunter,” who returns home from the woods of knowledge without beauty or laughter (117–18). The best science, like the best literature, should surprise and delight. Seen through the lens of Stevens, science, like poetry, must give pleasure.

CODA

What I have set out to do here is to move the relevance of Wallace Stevens beyond the poet’s realm to a new province: *the classroom of interdisciplinary science*. To my knowledge, such a venture has not been attempted before.⁵ I trust the interested reader will see the approach described here as a starting point, not the final word on the subject. Yet I believe this work has traveled sufficient distance to expose an irritant truth: *For too long have scientists-in-training been cut off from the genius of Stevens*. In *Poetries and Sciences*, I.A. Richards reflected that “if the mind is a system of interests, and if an experience is their movement, the worth of any experience is a matter of the degree to which the mind, through this movement, proceeds towards a wider equilibrium” (36). In a time of extraordinary change in the learning landscape, producing portals to Stevens provides students this “wider equilibrium”—opening a new gateway to language as process and to achieving the imagino-analytical balance of the skillful discoverer.

Moreover, situating Stevens as a sustaining force in the education of scientists extends poetry’s reach as a partial buffer to the progressive marginalization of the humanities. By seating Stevens in the classroom of interdisciplinary science, we witness him shaping young scientists as they seek to order experience mentally

and live their lives better. His words, far from lamenting an anxiety of the unknown, are expressions that inspire wonder, even joy, amid the uncertain. Students of science are drawn to his process of formulating rich descriptions of human experience that, just like the observations of scientists, are rooted in reality, yet must always fall short of any final depiction. More secure in their own unfinishedness, students shaped by Stevens stand more poised, ready to reengage with a Nature ever-escaping. For if “the final belief is to believe in a fiction” (CPP 903), then scientists-in-the-making under the sway of Stevens have been made ready to become believers.

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Notes

¹“The Limits of Perception, Thought, and Language” is Part II of Bart Eeckhout’s *Wallace Stevens and the Limits of Reading and Writing* (133–269). Separate from Eeckhout, during a decade of teaching graduate students in the life sciences, I too have explored this powerful nexus that informs situational excellence across many professional domains. See Waters (The Paradox) and (On Cultivating).

²The notion that to feel oneself as lost (disoriented) implies that one is feeling oneself, a necessary forerunner to personal growth, is developed by Ortega (27–34).

³Stevens wrote in his *Adagia*: “Things seen are things as seen” (CPP 902).

⁴Multiple aspects of Einstein’s idea of “the right problem” are developed by Thorpe (24–43).

⁵Earlier scholarly works by Judith McDaniel and by Lisa Steinman, which explore linkages Stevens drew between poetry and science, did not develop how scientists-in-training could be shaped by exposure to Stevens.

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