

## **The Atomic Weight of Metaphor: Writing Poetry Across the Curriculum**

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In my first chemistry class in high school, the teacher set us at our lab tables with a few sheets of yellow paper and a candle. He lit the candles and asked us to write on the yellow paper about what we saw. Now, I was not what you would call a cooperative student in high school. I generally completed only those assignments for which I could see a clear practical purpose—this was not one of them. So I set my pen to paper with the aim of subverting his assignment by substituting one of my own. I decided to allow myself to be carried away by the dancing motions of the candle flame, to compose a sort of prose poem, an ode to the candle, a work of undying literary significance which would be utterly without scientific merit.

To my surprise, I not only received full credit for my assignment, but my response was held up as a model for the class. I was criticized only for writing some speculative sentence about how the beads of wax would eventually course down the sides of the candle, a speculation for which, as my science teacher pointed out, I had no direct evidence. He actually praised my use of metaphor, calling the whole thing a wonderful example of scientific writing.

My first reaction was to worry that I had given him the impression that I would be a good student, which would cause him to expect more of me than I was willing to give. But beyond that, his response unsettled me. My teacher's reaction to my response to the assignment did not fit my view of the world. The incident stayed with me, even though at the time I didn't know quite what to make of it. Even then, I vaguely suspected that I had been tricked in some way by my education into seeing artificial divisions of knowledge that did not, in fact, exist.

Many years later, I found myself with a graduate assistantship at Phillips Exeter Academy. My task was to work with minority students

who were having trouble adjusting to the rigorous academic culture of the institution. I was supposed to be teaching them study skills, but with the demands of their academic program, they were both unable and unwilling to take on anything that would result, in their view, in their having to do more work. So I endeavored to teach the study skills through the medium of subjects with which they were having difficulty. Chief among these was chemistry.

My chemistry study sessions were filled with metaphor. Around a huge oak table, we talked our way through the chapters, gesturing wildly with pencils and drawing out models of what we understood. We tried to understand valences and atomic weights through the creation of visions of imaginary worlds—atomic structure as the solar system with a nucleus sun. Sometimes we would simply stop; the room would go silent and we'd marvel at the exquisiteness of organic compounds, the incredible symmetry of chemical reactions. We found beauty in the balance. Again, I felt as if I were living outside of the boundaries of acceptable science, but when my students started to do well on exams, again I questioned what I had been taught about the divisions between fields of knowledge.

I began to read scientific writing again when doing research for various fictional stories I was writing. In some reference books on botany and zoology, I was startled to find writing beautiful enough to be poetry. But in thinking about it, I began to make sense of it. Good scientific writing, like all good writing, draws on a wealth of detail and specific language. Meticulous distinctions (such as those between two nearly identical sub-species of flora) require precise language. If good content makes for good poetry, I wondered if we might conversely use content knowledge to enrich poetry.

Most work with writing across the curriculum has concentrated on bringing the techniques of writing to learn into the classrooms of various disciplines. We encourage science and history teachers to make use of response journals, to do in-class free writes, to allow students more latitude, both in responding to each other's work and in expressing themselves in different genres. I began to wonder if it might not be profitable to take it back the other way and to use content to enrich poetry.

When I noticed that much of the poetry produced in my Creative Writing class was vague and dealt with general subjects such as existential angst and emotional volatility, I assigned students to research a scientific phenomenon and use what they learned as a metaphor in a poem.

Creative Writing is an introductory level course, and many of the students were also completing their general education science requirement. Instead of doing extra research, they combined tasks. They were able to create metaphors out of the descriptions of the human skeleton in their anatomy texts or the progress of a tornado in the meteorology lab manual.

Their poetry improved, which had been my goal, but I began to think as well about how these poems might have affected their understandings of the scientific concepts they were using as their basis. It occurred to me that poetry would provide a way of approaching course material in various disciplines which might allow for the emergence of different types of understandings of the material. Poetry writing has the capacity to tap into the imagination, the unconscious and underlying knowledge structures. One problem I always experienced in my brief career in required science classes was that whereas I could do quite well while I was in them, upon leaving I would instantly forget everything I had learned. Without anything with which to connect and relate the knowledge, it all would seem to fly out of my head as soon as the course was over. Perhaps through writing poetry, students would be able to make connections on a deeper level than they might through other types of writing, and thus be better able to retain it.

Last summer I ran a workshop on using poetry to teach New Hampshire history. As the workshop participants had stronger backgrounds in New Hampshire history than I did, I had these mainly fourth grade teachers compose poems based on the content they were teaching. I was amazed at how well their poetic responses brought the content to life. Their poems made the content memorable in a different way. Many chose to write persona poems in which they took on the voice of a character such as an aboriginal inhabitant of the state, Hannah Dustin, or a colonist at the time of the revolution. The poetry allowed for connection to the material on an emotional level, with a depth rarely seen in other types of writing across the curriculum.

The teachers speculated that the poetry might help students with different learning styles to connect with the material. This certainly echoes my experience with chemistry over the years. Some students relate better when there is an opportunity for connection with the material on an emotional level, and many of us learn better through metaphor than formula.

In fact, this makes good sense, given that reasoning through anal-

ogy and metaphor, which poetry encourages (if not demands), are generally recognized as strategies of successful writers and thinkers in many disciplines. The ability to relate seemingly disparate pieces of information, through observing what can be applied from one process to a seemingly unrelated other, allows us to make leaps of understanding. Poetry builds on these processes, thus encouraging this kind of thinking.

Like all creative writing, poetry writing requires synthesis of material. In writing a poem in the persona of a 19<sup>th</sup> century mill worker, the student poet must not only know a lot of facts about life in that time, but also be able to move beyond those facts to create an entire world in his or her poem. After writing that poem, the student will understand the information in a different, more significant and more memorable way.

My forays into poetry across the curriculum have been necessarily limited by the fact that I am mainly a writing and not a content teacher. But all of this has caused me to wonder if some of those walls we erect between disciplines ought to come tumbling down. Those barriers we have constructed to protect our small patch of academic turf might also be shutting out light and air. Perhaps if my chemistry teacher had allowed us the chance to compose poems about our lab work, I might be teaching science instead of literature and writing. Infusing poetry across the curriculum might allow me to integrate both.