The Shapes of Our Souls and Other Student Concerns: Poems about the Course "Mathematics in Literature"

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Abstract

Six years ago, at Arcadia University in Glenside PA, I developed a course called Truth and Beauty: Mathematics in Literature. In this course we study poetry and fiction that is inspired by or connects with mathematics. We also study the math with which our readings connect. Mainly, I try to convey to students that all three – math, literature, and our lives, outer and inner – are very often related. In particular I, as a mathematician/poet, have used images from math to express what I feel. In the homework questions and class conversations I encourage but don't require students to share their own experiences, lives, and thoughts, and I share mine. The sharing in the homework complements the sharing in our class conversations. Students have said and written some very cool things, and so have I! I hope that, in these poems, I have achieved a balance between student and professor coolness, and expressed the insight and communication that have taken place in this course.

Introduction

Six years ago I developed, at Arcadia University in Glenside PA, a course called Truth and Beauty: Mathematics in Literature. In this course we study poetry and fiction that is inspired by or connects with mathematics. We also study the math with which our readings connect. I try to convey to students an appreciation of mathematics and literature, and of how they often connect, also how both can connect with our own lives. The homework questions are designed to encourage but not require students to share their own experiences, lives, and thoughts relating to the readings, and in our class conversations I share the same.

The course uses two texts, one for short fiction and one for poetry. Our fiction text is "Fantasia Mathematica" [2], edited by Clifton Fadiman. Our poetry text is "Strange Attractors: Poems of Love and Mathematics" [3], edited by Sarah Glaz and JoAnne Growney. Since our fiction anthology was published in the 1950s, and since it's outdated in several ways, I supplement it with pieces of short fiction found online. For each reading in the course there are two homework assignments. One consists of questions designed to stimulate students' thinking, feeling, and writing, while the other consists of math questions that connect in some way to that reading. The course is innovative and interdisciplinary, and satisfies both math and reading requirements. Students are undergraduates, some math majors, some not. Some identify as writers, some don't.

A few of the course objectives are: (1) to develop an appreciation for both math and literature, and an understanding of the potential for connections between the two and of the possibilities of mathematical literature, (2) to gain experience in thinking and reasoning quantitatively, (3) to express mathematical reasoning both in mathematical language and in words, (4) to explore social issues, including issues within the math community, and (5) to learn about math culture as well as math itself.

One story that we read and study is "An Old Arithmetician" [4], written back in the nineteenth century. Its heroine is an old village woman who just happens to love and be very good at "sums", as she puts it. One heartwarming thing about the story is, the village loves and admires her for it – none of this business of G. H. Hardy's "mathematics is a young man's game". There's a small plot; the old woman's pre-teen granddaughter gets lost, partly because the woman has been so involved in her latest "sum". One of my favorite passages describes the woman's struggle within herself; is it okay to work on that "sum" while she's so worried about her granddaughter? Indeed she's tempted to. One theme of the story is the polarity between passion for one's work and passion for one's family, and polarities was one of the non-mathematical phenomena explored in the course, while "sums", finite and infinite, became mathematical explorations.

In the process of sharing and becoming close and comfortable as people, students have said and written some pretty cool things, and so have I! To me it has all felt like the stuff of poetry and I've written an as-yet-unpublished chapbook-sized collection of prose-poems about our interactions in the course. I hope that these poems have achieved a balance between student and teacher cool-ness, as well as expressed the communication and interaction that have taken place. This paper consists of some of these poems and provides whatever background information seems pertinent or enhancing.

The Poems

The first poem in this paper is about our class's reaction to Young Smith's poem, "She Considers the Dimensions of Her Soul". In the poem a woman laments that her soul seems to be shaped like a square, whereas she would prefer it be shaped like a cube. One of the homework/class conversation questions appears as the title of my poem, and the body of the poem consists of a medley of students' answers to that question:

"WHAT DO YOU THINK YOUR SOUL IS SHAPED LIKE?"

Haben's soul is a pyramid. Just like a pyramid, his life path starts to get narrow, working towards the point at the top. Xiana's soul is a star. She is bright and unique like a star. Her soul has corners but not like a square. Every time her life changes her soul develops a corner. Meghan's soul is also a star but not always a good star. Her star pokes and prods and its points are sharp and hungry. And Austin – his hobby is hunting – his soul is shaped like a shotgun. Forgive his politics, he's not 21 yet and he loves his girlfriend and baby godson; guns to him represent empowerment and protection. And Jene thinks about auras and colors rather than shapes.

At first Brynna thought her soul might be some complicated interesting shape like a pentagon or crescent moon or snowflake or fractal, but then she decided it wasn't jagged or piercing. Her soul is a bioluminescent amorphous thing that lives in a semiotic relationship with her physical being, it would never injure her or make her sad.

But Luke's soul might. Though it's a liquid, it's an opinionated liquid intruding in his life. Just by observing him you can see that soul, watch out for it.

As, each semester, the students get to know one another, several issues and concerns emerge, common to people of college age. Students have enjoyed, and in some cases gained from, our conversations about these concerns. The only nonfiction reading was "The Night I Almost Didn't Grow Up" [1], a short memoir by me in which I describe the "night" of the title, which occurred during my first

week of college. Like many brand-new college students I had a bad case of the "lump in the throat" syndrome, perhaps better described as homesick-ness. The "plot" of that memoir was, math saved me, as passion for one's purpose in life is often a life-saver. For their term papers I invited students to write their own "math memoirs". The poem below paraphrases, using my own poetic interpretations, one incident described in one student's paper:

NATE'S MATH MEMOIR

Nate, back in kindergarten, couldn't choose a number. The teacher wanted everybody to choose a number and Nate just couldn't. He was excited about what the teacher had planned but he just couldn't get started, maybe it was a little like stuttering, he was stuck on not choosing a number so he ran into the boy's room and sat there crying. When he came out the teacher was just outside waiting to understand and comfort him. When they got back to the classroom he did choose a number, he chose 4, and that was the number he used for the teacher's game and that was the number he used for the rest of his life, that was his lucky number, whenever anybody asks him for a number that's it.

Many of the readings have to do with math philosophy; they asked meta-mathematical questions. In Arthus Proges' story, "The Devil and Simon Flagg" [2], a mathematician challenges the devil to prove Fermat's Last Theorem, a feat which, at the time of our fiction text's publication, had eluded the best mathematicians for 350 years. If the devil can do it, he gets the guy's soul; if not, he gives the guy riches and lifetime happiness. The following poem describes an incident from our class conversation about that story.

"CAN ABSOLUTE POWERS CONTROL ABSOLUTE TRUTH?"

Only the very religious students said yes, definitely, God or Jesus can do anything, God or Jesus decides what the absolute truths are. But most students said no, and Matt said if he asked God to make 2 + 2 equal 5 and God said yes, he'd be watching, listening for the change. First he'd give it a minute. Then he'd give it five minutes. Then, maybe, ten. Finally he'd say to God, "Well?" And God would have to answer, "I didn't say when." And Deanna across the room called out to Matt, "I know what you mean."

In our poetry anthology Rita Dove's poem, "Flashcards" [3], relates how, although she was a math whiz, she sometimes felt pressured by the expectations held by, in particular, her father. In the poem Dove did not directly address fears, but I happen to know somebody who, in her childhood, was afraid of flashcards, something about the sudden-ness. Since flashcards aren't necessarily feared by every kid on the block, I used that as an opportunity to invite students to talk about unusual fears. One thing about fears is that many, while not necessarily mathematical, are math-*like;* some fears involve shapes, space, or positioning of objects. This idea is, I think, supported in the following poem:

AN UNUSUAL FEAR

Melissa used to be afraid of her room at night. Especially the corners, and I remember the expression on her face when she said that last.

Nothing fits in a concave corner, a concave corner is a room too small for anything to go into but large enough for things to come out of, the opposite of a black hole.

And nothing balances on a convex corner, anything unlucky enough to touch a convex corner swivels in outer space. There are no laws of probability for that object. Like a skater on frictionless ice it's stuck in random wobbling and it hasn't the option to fall.

Throughout the above-mentioned story "An Old Arithmetician" [4], the woman expresses her feelings about math; one thing she says is the title of my next poem. It's about counting; several of our readings concern the idea of counting so the class has ample opportunity to talk about counting.

"SOMETIMES I THINK I'D RATHER COUNT IN THIS WORLD
    THAN SING IN THE NEXT."

The Old Arithmetician counted leaves on trees. I count colors in a print fabric and scallops on a decorative dish. But the all-time class favorite is stairs. Not stars but stairs. Mostly stairs going up, not down, and some of us count other things that don't need to be counted.

But *we* need to count them, we need to distinguish each from the one preceding and the ones following. We need to ensure that they're not all the same.

Concluding Remarks

As said above, the intention of the course is that students begin to appreciate math, literature, and the connection between the two. One of these connections is life. In discussing all three, students talk about many of their concerns, including math concerns. Many sorted out their lives; one student wound up making an actual life change, based on some of our class conversations. We talked about math culture as well as math itself. Many students said they felt better about math than they had and feared it less.

An important element of the course has been trust. Students have begun to trust each other, me, and thereby math, and those who already love and trust math get further in touch with these feelings. Several students said that the course offered "a new way to look at math".

References

[1] M. Cohen, *The Night I Almost Didn't Grow Up,* Journal of Humanistic Mathematics, 2(2), 109-113, 2012

[2] C. Fadiman, ed., *Fantasia Mathematica,* Springer, NY, 1997

[3] S. Glaz and J. Growney, *Strange Attractors,* AK Peters, NYU, 2009

[4] M. Wilkins, *An Old Arithmetician,* wilkinsfreeman.info/Short/OldArithmeticianE.htm