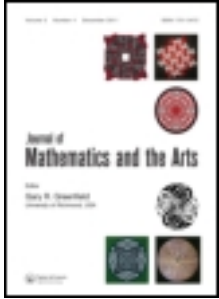


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Book Review

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BOOK REVIEW

Bridges 2013 Poetry Anthology, edited by Sarah Glaz, Tessellations Publishing, Phoenix, AZ, 2013, 57 pp., US \$19.95 (softcover), ISBN-13: 978-1-93866-405-2

When a copy of the *Bridges 2013 Poetry Anthology* arrived in the mail, I quickly gave it a once-over. I then wrote to *Journal of Mathematics and the Arts* editor Craig Kaplan, who had invited me to review it here, to let him know I had received it. I looked forward to reviewing it, I told him. For one thing, I was quite taken by its wrap-around cover, designed by Robert Fathauer. Its background features Juan G. Escudero's composition 'd6-RootA3-IC', with a photograph of George Hart's metal sculpture 'Gazmogenesis' displayed prominently on the front. This visual art was just the thing to make one eager to see what was inside!

There I noticed more than few poems already familiar to me. Some of them I had discussed on a mathematical poetry blog I previously had at the *Scientific American* website (poeticks.com/math-poetry-blog/). They were enough to convince me that the anthology would be worth delving into, and fun to spend time with.

In the introduction by editor Sarah Glaz, we learn that its poems are by participants in the poetry readings at the past three Bridges conferences (www.bridgesmathart.org). These international events have been held yearly at different places throughout the world since 1998. Their goal is to provide a meeting place for persons (mainly mathematicians) interested in thought and discussion in the cultural zone where mathematics and the arts overlap.

According to Glaz, the featured poets are an interestingly varied bunch: 'college professors doing research in mathematics, statistics and philosophy; engineers; higher-education administrators; librarians; professional artists, writers, translators and poets; primary and secondary school teachers and more'. In short, we can expect the poems in the anthology to be coming to us from a great many directions (and dimensions).

However much they differ from one another in style, technique, and outlook, these poets share an urge to convey the human adventure of mathematics. We are given fragments from the history of mathematics and biographies of its famous figures, as well as personal material such as reflections on teaching mathematics and the 'mathishness' of a conversation between two 'girl' mathematicians at an art museum. Frequently, they use mathematical figures of speech – and mathematical ways of thought – as poetic tools to explore such subjects as the 'light-bearing equa-

tion called love'. Introspection and wild tripping into the meanings of infinity are two other ways they reveal the humanness of the mathematical mind through poetry. The result is an exciting view of how mathematics and poetry can merge to the great benefit of both.

The anthology's first piece is Michael Bartholomew-Biggs's 'Numerical Analysis Quasi-Haiku Sequence', which consists of seven short poems. Four poems contain a text in a 5/7/5 classical haiku syllable pattern. The other three contain two such texts, one on top of the other. My first feeling about them was negative, for I thought Bartholomew-Biggs was calling his pieces 'haiku', which are not. But, as his title indicates, he was clearly not doing that. Once I realized that, my view of his piece changed considerably. For one thing, it kept me from condemning the poem below, which begins his sequence, for being an 'idea-poem', which haiku are never supposed to be:

TAYLOR'S THEOREM

If we knew it all
for just a single moment
we'd hold the future.

It seems to me to come out of physics, not mathematics, as I expected. No matter: it works as a poem – as more, that is, than an amusing re-statement of a theorem (amusing by virtue of being turned into a poem). Or so I concluded after considering how, as an idea-poem, it could do what the best genuine haiku does – bring two images from nature into an unexpected juxtaposition that puts us in touch with some large archetypal truth.

As I thought about it, its 5/7/5 syllable pattern more or less forced me to consider 'Taylor's theorem' as two images after all; albeit, anti-haikuically abstract rather than haikuically concrete. It thus became for me the image of a single unit of time in tension with the image of all that the future is! The sequence performs variations on this idea all the way to its end with 'Ill Conditioning', which concerns the catastrophe theorists' idea of the ramifications of 'one butterfly's wingbeats' in parallel with 'one decimal's doubt'. Again a single moment and the vast totality of what will follow, opposing but at the same time enriching each other.

Meanwhile, I noticed other more concrete images in the sequence, although not quite from concrete reality, for they were all from the mind of Edgar Allan Poe. For instance, in the sequence's fourth poem, 'Linear Convergence', Poe's pit

and pendulum unexpectedly illustrate the way 'Each repetition/closes on the vital point'. The tell-tale heart, the fall of the house of Usher and the raven cackling 'Nevermore' show up too. In short, the sequence is much more than a series of philosophical ideas.

Bartholomew-Biggs's other two contributions 'Teaching Practice' and an excerpt from his 'Fred and Blossom' sequence about aeronautical engineering in the 1930s also fascinatingly combine idea and image.

The work of the next poet in the anthology, Tatiana Bonch-Osmolovskaya, nicely demonstrates the variety of the poetry to be found here. Two of her three contributions are visual poems, something very few mainstream anthologies ever include. The first of them, 'Sandglass', consists of descending lines that contain just one repeated chronological term beginning with 'eternity', then 'years', on down to 'secs'. Each of the lines diminishes in width and the size of its letters down to a zero at the point of the triangle they form. From zero, ascending lines in what I assume to be Russian form a reversed triangle, and probably say something similar. The result is quite an arresting image depicting both an hourglass and two highways to oblivion.

Bonch-Osmolovskaya's other visual poem amusingly uses an image of two spheres with the word 'square' repeated in circles around their surfaces in letters diminishing in size, thus carrying out the poem's title 'Squaring the Sphere'. Her more conventional 'Two' is a wry take on Zeno's paradox about never being able to reach a destination because successive jumps halfway towards it will ever keep it out of reach. Every once in a while, it veers deeper than wryness with poetically provocative lines like 'Dreams look at each other in mirrors in their dreams', that carry us down into the same archetypal zero in the centre of her first poem.

Alice Major also offers a wry riff on Zeno's paradox, asserting that 'we know/the thrumming calculus of life comes/to completion' (disproving the paradox), then contradicting herself at the poem's end, when she speaks of 'something (that) stalls/in the air, an infinitely subtle slowing', and goes on to muse that 'of whatever I have

learned when the arrow falls/silent/one last sliver will be lost/a final distance will remain uncrossed'. Notice, though, how the rhyme at the end contradicts her contradiction with its auditory resolution!

In her 'Infinity to the Nth Power', Amy Uyematsu refers personally to her skirmishes with Zeno's paradox and similar matters, bringing in 'Old Man Pythagoras/(who) insecure about the whole matter – (deemed) the finite masculine and good/while infinity was feminine – both had to be/subjugated – as if either could'. In her other poem here, 'Möbius Strip', she playfully deals with what seems to me another version of Zeno's paradox (as does Alice Major's related poem 'klein bottle').

Though unnamed, Zeno's presence is felt yet again in Emily Grosholz's 'Reflections on the Transfinite'. Cantor, growing 'Wiser and more insane' is named, as is Kronecker, the poem's narrator sharing his 'feeling for/the natural numbers, those deceptively well/ordered, step-wise creatures which appear/transparent as they mount, but all in all/Among themselves are most unknowable'.

Zeno's paradox turns up one last time (albeit *very* indirectly) in Philip Holmes's 'Fractions From the Still', which is primarily about the final indeterminacy of 'where we're headed', and ends with the provocative assertion that 'what didn't happen is also what we are'.

Holmes's other contribution explores a subject quite a bit different from infinity and zero, but – for me – similarly archetypally deep and mysterious: the human mind. The poem entitled 'Minding One's Business' is a deft unrhymed sonnet which begins, 'I think I know that brain creates the mind/but why is this so hard to see?'. It goes wonderfully (albeit not mathematically) nowhere/everywhere about the mind.

Carol Dorf's 'On Definitions' is a poem I was quite familiar with before seeing it in the anthology, for I'd analysed it closely in one of the entries I made to my *Scientific American* blog. Below, to give you an idea of how effectively Dorf uses formatting to visualize what is going on in the 'quantum foam' she speaks of, not to mention in her mind, is its first third:

With all the ways time loops in the quantum foam definitions slide away	where light and gravity interact in long waves
Her mother could have said "a life defined by sorrow"	when metaphors turn upon themselves before they intersect in hyperbolic geometries
but it might have been sparrows or tomorrow which is a problem when tomorrow loops around today	

At first I took this poem as a sort of meditation on the complexity of the universe as encountered by theoretical physicists. But portions of the poem gave me trouble – such as the observation of what ‘her mother could have said’. I asked Carol and learned that the poem was a response to the passing of her friend, Randi Engle, a math education researcher. At that point, the poem, already a rich one, opened up further for me. I suddenly became aware of what seemed to me the poet’s elegiac attempt to make sense of a friend’s death the way physicists try to make sense of the universe . . . and a reader tries to make sense of a difficult poem.

Kaz Maslanka’s two contributions to the anthology are special for me because they carry out mathematical operations using words in place of mathematical terms. Hence, I contend (no doubt in good part because I myself specialize in such poems), they provide their readers with a mathematical adventure of a different order than any other mathematics-related poem does (though, I need to emphasize, not necessarily a superior one). Each of them is an illustrated algebraic expression in which one variable is equated with a simple fraction.

His ‘singularity’ equates the term ‘secrets’ to the quantity ‘nightmares’ times ‘Truth’ (capitalized) divided by ‘flower’ (a single flower). The key to appreciating this equation is to understand *viscerally* how much mathematical multiplication can do for a poem – compared to simple addition, say. Here it surrealistically but penetratingly asks what would happen to nightmares if Truth multiplied it . . . and then a single simple flower divided it.

His other formula equates the division of ‘confidence’ by ‘ego’ to ‘lucidity’. It is illustrated by a sequence of five images of a meditating monk gradually disappearing completely, then returning. Ego dissolution in other words. Or transcendence – likely based on Maslanka’s own experiences meditating at monasteries overseas.

Geof Huth’s mathematical poem ‘231. Innumerable Thoughts’, ends with an equation asserting that 18,489 minus ‘whatever I’ve forgotten’ divided by ‘whatever I’ve made up’ is approximately equal to 49, plus or minus, his age at the time he wrote the poem. A poet fond of puns, Huth cannot resist inserting the lines ‘I won a bet/that some words/were numbers too/for I ate many/at breakfast’, which is typical of the kind of fun he often goes for in his work.

Huth is also responsible for the only specimen of purely numerical visual art in the anthology, a piece called ‘1234567898’. It is a simple design consisting of three triangles composed of the digits 1–9 that join each other in such a way as to form a fourth triangle consisting, importantly, of negative space. The result is both mathematically and lexically meaningless but somehow resonant with almost supernatural intimations of a meaning beyond words and numbers. Perhaps it has to do with the power of pure pattern to elicit . . . attention, or even reverence, which, I am convinced, is an innate part of all of us.

Deanna Nikaido’s ‘Solving Light’ may also be said to carry out a mathematical operation the way Maslanka and Huth’s equations do, but it does not do so directly enough for me to be sure of the fact. Be that as it may, it makes intriguing (poetical) sense about ‘the weight’ keeping her ‘from solving/this light bearing equation/called love’. This poem is one of the anthology’s few that delve into the mystery of human relationships, along with Nikaido’s fine ‘Love By Numbers’.

One last poem that seems to me at the frontier of mathematical poetry, in a style that I hope will be further explored in the future, is Sarah Glaz’s fascinatingly strange ‘13 January 2009’. It consists of two texts side by side. Part of its title, ‘13’, is above the text on the left; the rest, ‘January 2009’, is above the other text. ‘13’ has nothing in it but numbers (and equal signs), the numbers descending in order from the 13 of the title down to 1. We soon realize it to be a coded form of the other text, which is devoted entirely to words about the dying of a man named Anuk. The result seems a deep vision of the path that numbers, and we, inexorably follow – with a terminal period the sole thing in the final line of the text to the right.

The history of mathematics figures in several of the poems here, an excellent example being Glaz’s ‘Calculus’, which discusses the invention of calculus by Leibniz and Newton. It reminds us how little mathematicians resemble the robots by which they are too often caricatured. Another is Francisco José Craveiro de Carvalho’s delicately realized moment out of an important mathematician’s life, ‘Portrait of Max Dehn’, as translated from the Portuguese by Manuel Portela. The poem treats Dehn leaving his homeland with the same kind of inspired empathy with which Keats famously described Ruth, ‘amidst the alien corn’. Craveiro de Carvalho also provides us with a similarly moving moment from Emmy Noether’s life, ‘Emmy Noether at Bryn Mawr’.

Noether shows up again in Emily Grosholz’s melancholy elegy to Göttingen, ‘the greatest commonwealth of mind/Europe ever knew, dismantled by the agents of the Reich/who sized up living mathematicians as Catholics, women, Jews’.

Then there is JoAnne Growney’s elegy to Sophia Kovalevsky, ‘With Reason: A Portrait’, which leads us through 27 dangling clauses, each of them beginning with ‘Because’, culminating in ‘Because she caught influenza, complicated by pneumonia/at age 41 Sophia Kovalevsky died’. The poem provides us with a remarkably compact and sensitive biography of Kovalevsky’s too short but nonetheless notably productive life.

The feature of Stephanie Strickland’s ‘Grothendieck’ that most intrigued me was how, in going from ‘Grothendieck/sees everything globally from the beginning Hironaka/said *no coordinates no/equations*’ down to ‘blow it up (gentle difficult/*balloon work*) make it/smooth’ (Strickland’s spacing and italics), the poet gives us a

wonderful imagistic/intuitive picture of what Grothendieck seems to have been up to as a mathematician.

As you might expect of a poet who named one of her collections *Crossing the Equal Sign*, to absolutely define the parallel adventures of poetry and mathematics, Marion Deutsche Cohen has thought deeply about mathematics and – in her two contributions to this anthology – about being a mathematician. In ‘What Drove Me Into Math’, she tells us it was not ‘the Mystery of the Unknown/But the mystery of the known’, then goes on in her next stanza to tell us of ‘Other early influences’, such as ‘The point of light just happening to coincide with the visible corner of our living room’. Her other poem compares a mathematician to an action hero as one who has ‘swum through iron, run without roads, flown without sky’, and the like. Poetic exaggeration? Perhaps, but only to a non-mathematician!

Eveline Pye is another among the anthology poets interested in trying to capture what a mathematician is. In her ‘Solving Problems’ she suggests it is mainly learning ‘to manipulate x ’s and y ’s until/decisions are made in your fingers’, which she then compares to the ‘way Reubens painted/hands, again and again or Keats scribbled rhyme/after rhyme – and then you go with the flow’. With luck, you arrive at ‘a sweet, sweet moment/as the plum falls into your eager hands, and if not/you try, and try – on and on until your head bursts’. Her other three poems here continue these kinds of thinking . . . or, perhaps I should say, continue the decisions made in her fingers.

One other poem that stands out for its sympathetic insights into what she calls ‘mathishness’ (which causes those with it ‘to want narrow/exacting limits on what words mean)

is JoAnne Growney’s ‘Girl-Talk’, which is about two mathematicians on a visit to an art museum.

The only poet whose work in the anthology I have not mentioned is the twentieth century Persian poet Forough Farrokhzād. ‘Someone Who is Not Like Anyone’ (in Michael Craig Hillmann’s smoothly flowing translation) is her only work here. Mathematician Saeed Ghahramani, author of a book on Persian poets, which includes a discussion of Farrokhzād, read it at the first of the Bridges poetry readings in 2011. Hence it is included in the anthology, although it has nothing to do with mathematics. I’m happy it is here, though, for I had never heard of Farrokhzād, and she certainly merits the high praise Ghahramani gives her in his introductory remarks. The poem rapturously concerns ‘Someone (who) is coming from the sky/Above Artillery Square on the night of the fireworks/and he’ll spread out the table cloth/and divide up the bread/and pass out the Pepsis’ and contains nine more comic, but optimistically somehow serious lines.

In conclusion, when I began thinking about this review, I had visions of making an insightful taxonomical study of its poems, but their ‘multi-dimensional links to mathematics and . . . wide range of styles’ as Glaz has it in her introduction, and wide range of techniques, I would add, made that too difficult a task. So all I have to say now is that I hope anyone still reading this has enjoyed my chatter as much as I have enjoyed indulging in it.

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