Journal of Humanistic Mathematics

Volume 7 | Issue 1 January 2017

Moving Between Inner and Outer Worlds

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POETRY FOLDER

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My poetry seeds were sown in college in Susan Wood's upper-division poetry seminar at Rice University. Two decades later, I began letting mathematics interact with my poetry (as it already had been doing with my songs). I've been blessed to have my mathematical poetry read on a regional NPR station, performed at JMM and Bridges readings, and published in diverse venues, including: *Talking Writing*, *The Mathematical Intelligencer*, *BorderSenses Literary Magazine*, *Journal of the Association of Mexican American Educators*, *Intersections: Poetry with Mathematics* (JoAnne Growney's blog), and *Journal of Humanistic Mathematics*.

As with many writers' paths, my early poems and songs were quite personal and literal as I gradually learned how the particulars of experience could more artistically depict or engage larger realms of meaning. This idea of progressing from the innermost (grouping) follows conventional mathematical order of operations, and we acknowledge both connections by opening this poetry folder with a quintet of poems that are more explicitly autobiographical – first conjecture, inspiration, teaching, or struggle with mathematics, or using its language as a vehicle to process the health challenge of a family member (before we knew she would be okay). This is followed by a quintet of poems that focus outward, reflecting on ideas from statistics/mathematics (education) more philosophically than personally.

I value both types of poems because some mathematical thoughts spark poetry better expressed with a certain kind of distance, while others call for elements of personal narrative. Georg Cantor stated "the essence of mathematics is in its freedom" and John Tukey noted "the best thing about being a statistician is that you get to play in everybody's backyard." For me, these quotes also apply to poetry, which has proved a delightful vehicle to translate among these (and other) realms as I find new ways to move between my inner and outer worlds, taking many a turn for the verse. Perhaps some poems approach a dimension where (like Klein bottles) inside and outside merge.

–Lawrence Lesser (Lesser@utep.edu), El Paso, Texas, USA.

This folder begins with a quintet of poems that are more explicitly autobiographical – first conjecture, inspiration, teaching, or struggle with mathematics, or using its language as a vehicle to process the health challenge of a family member (before we knew she would be okay). In particular, *Discovery* relates the first mathematical conjecture I remember making. *Business Statistics* was inspired by the first college course I taught as instructor of record. *Julia* is about my paternal grandmother. *L'Hospital* relates an indeterminate situation not readily resolved. *The Zero* draws from Mayan civilization and an experience of struggle in college math.

Discovery

I stumble
upon the sum
of the first
cubes
always a square. As a middleschooler,

did I discover
a true, new result
and, if so,
will people value
the "Lesser Theorem"?

Dad unsure
of originality,
we visit
Dr. Peaceman,
an engineer friend

whose *CRC* reveals
pages of
identities yielding validation,
and awe of how much
further the frontier.

Business Statistics

The first stats course I taught meant business:
the book had index numbers and time series,
the coordinator had us aim for a 2.5 GPA,
and some students would leave once
the lecture finished what was on the test.

Prizing practicality,
a standing ovation marked my mid-term arrival
to replace a lecturer who formally proved the formula
for a union's probability when a
simple diagram sufficed.

After my lecture on graphical pitfalls, a student already
outdressing and outearning me asked were they to do this
in the business world, making me see
I could no more ensure moral practice than control
how they use fire.

Julia

for Julia Louise (Shanblum) Lesser, 1907-1981

Julia set
in motion my journey
in mathematics.
For a quarter-century, my grandmother
taught math with distinction
in the public schools
of Fort Worth.
Driving up to Colorado for my first professorship,
Dad and I stop at her grave,
reflect on how

Julia set
a tone, left a legacy.
In our family of
complex dynamics,
a tiny perturbation
could yield big changes.
Surely the enrichment
gems she'd mailed me over my youth
made such a shift in my intellect.
A perturbation no less important was how

Julia set
aside gender roles.
She was an athlete in her youth and later
coached baseball teams of each gender.
A former student wrote my dad,
"Your mother taught the girls we could be
savvy in math right alongside the boys...
your mother opened up the ordered universe for us. I can still see
the chalk flying when she hit the board
in a frenzy of excitement."

L'Hospital

With health, it's all
How you group
The operations, the functions
Of the body
Fracturing into a fraction
Calling for
L'Hospital.

There, confusion reigns beyond change of shift:
One nurse writes "NPO";
Another says, "Sure, you can eat."
And each person who enters
Starts by asking about
Allergies, surgeries, and family history.
Each test a bottleneck
Of waiting for the one
Who can authorize, organize, supervise, analyze,
And then advise, often
Only leading to needing another
Sample or image.

So far, it's indeterminate. What's still possible
Is anything from zero to infinity:
False positive,
Life-changing disease,
Or anything between.

Now a friend asks
How it's going.
My tongue
Finds no one
Word to sum up
How pain's controlled but not
The fear, the frustration with
L'Hospital
That I pray
(Being
Between
All and
Nothing) is nearing
Closure,
Not making rounds
Like $\lim_{x\to\infty} \frac{x}{\sqrt{1+x^2}}$.

The Zero

May a
shell reveal
value
of place, a place like
Yucatán lowlands,
Sierra Madre highlands,
the maize we navigate,
or the pyramid
we climb to offer enemy
heart?

Zero
(like the modal Putnam score),
said my blue book
from a three-question midterm
with mean in the teens
in sophomore honors calculus
taught by a brilliant scholar
with zero
people skills. I lacked
heart

to argue for the 7
I deserved.
Not nothing,
that zero made me
doubt
my newly-chosen math major.
Now (after degrees from two math departments),
I tell my students what can
be done with
heart.

As mentioned up front, the second quintet of poems is grounded in the outer world of mathematics, without an explicit personal view. In particular, *Availability Heuristic* reflects on how our thinking is influenced by what most readily comes to mind. *Polymath Aftermath* is an etymological reflection. $P(A|A) = 1$ was inspired by worldly examples of post hoc analysis or confusing the direction of causation or conditioning. (The middle verse refers to the *Bible Code* popularized by Michael Drosnin's so-named books and analyzed in 1994 and 1999 papers in *Statistical Science*.) *The Algebra Teacher Writes In Verse* was inspired by thinking about a one-to-one function's inverse as playing a movie in reverse. *Triangle* has triangular numbers of letters in each row.

Availability Heuristic

We don't readily see
ourselves
as replaceable, exchangeable objects,
arbitrary members of a population.

We're thinking: without loss
of generality, let the person be
me who today matches a birthday,
wins the lottery or falls in love.

Polymath Aftermath

Some fear our field
'cause the time
after divorce, death, or
destruction
is called the
aftermath,
though math could've spared
failures like Challenger
or Tacoma Narrows Bridge.

Shifting from
numbers to words,
aftermath turns out
to be a nonnegative word
rooted in agriculture:
The after-mowing,
the second crop or new plant growth
after the harvest.
And the original meaning of mathematics

entails broader learning,
includes more
sciences.
Let's embrace
the *beforemath*,
before math
went narrow
and aftermath
went negative.

$P(A|A) = 1$

Sportscaster bragged all night
'Bout the one prediction he got right:
"The more they've scored, the more they've won."
Probability of A given A is 1.

Writer made his Bible a find-a-word:
"TWIN", "TOWERS", and "PLANE" converged
When he let computers run.
Probability of A given A is 1.

"Fear breeds fear, war breeds war"
Said the call-in poll on Channel 4:
Father's legacy to son.
Probability of A given A is 1.

The Algebra Teacher Writes In Verse

Triple x, then add 5,
Then divide by 2.
Label that answer y –
Now let's flip the view:
Double y, take off 5,
Third makes déjà vu!

Triangle

I
see
we have
triangular
numbers, obtained
from natural number sums.
Twenty-eight is perfect to stop on
(for each even perfect number is triangular).