

LAW & IMPULSE

maths & chemistry poems

The SCIENCE MADE MARVELLOUS Project

Law and Impulse

Maths and Chemistry Poems

Science Made Marvellous

for

National Science Week 2010

edited by Brook Emery *and* Victoria Haritos

Project Editor: Carol Jenkins

The Poets Union Inc

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Mark O'Flynn

The Allotropes of Tin

[For Roy Tasker]

From the sublime to the ridiculous there is only one step
Napoleon Bonaparte
After the retreat from Moscow, 1812

Unbeknowst to him
it takes a chemistry lesson
to decipher the shreds of fabric left in snow.
Absent tin tells us more than tin;
cloth more than fossil
when the Spring thaw melts
to reveal history's diet of bones.
Certainly the neatest looking army in the field
Napoleon's men march towards the cold,
not knowing the compound elements
of French tin will crystallise at less than five degrees.
As coal to diamond, all those tin buttons
shining on the parade grounds of Paris,
who could imagine defeat
beneath the sun's benevolence?
By the time they reach the Russian Winter
the smart, tin buttons, yes, have crystallised,
corroded and crumbled from the uniforms
of Napoleon's sublime advance.
His men fight to hold their trowsers up,
clutch their uniforms together,
let alone aim a shivering musket
at an enemy laughing in the distance.
Their defeat creeps upon them like a mould.
Coal to diamond; love to hate; loyalty to despair;
flesh and the rot within the flesh.

The allotropes of tin slowly vanquish
an emperor, leaving their clues,
stripped of all ambition now,
naked arses fleeing,
cooling quickly under the warm snow.

Steve Evans

Luminous Fruit

*Pigs bred with implanted
jellyfish genes have noses
that glow in the dark*

Giotto's lemons had it,
but all those fat balls of incandescence
that loomed from his painted plate
like half-warmed streetlights
could not have foreseen this.

We can now read by the light
of a bowl of cherries,
though I prefer the wattage
of a duchess pear for a good mystery,
and the ceiling in my bedroom's hung
with satsuma plums,
their fleshy glow just right
for an erotic novella.

Outside, the night's so bright
we forget what darkness was.
The streets are a constellation of flirting colours.
The vast orchards of the eastern valleys
wink advertisements into space
and the whole planet's surface is littered
with the organic glitter of luminous fruit—
we're awash in the juice of their light.

10 digits of e

tracing the slope of your tangent
around a bell curve
the irrationality
of your decimal expansions
left me breathless

there was no room for doubt

in the ice of your bedroom
and watched your eyebrows move
 $f(x) = e^x$ at the point $x = 0$ is exactly 1
you said, smiling enigmatically
though there was no enigma
for you
you found patterns tjere
danced in the rhythm of perfect numerics
watching the decimal digits grow
and grow

you saw it everywhere

kept moving forward
while i fell back
to integers
unable to follow you
out of familiar territory

from the mundane
comfort
of here and now
I watched you trip
into the transcendental

Andrew Slattery

The Archaeologist

We uncovered a plate of blue metal,
determined its length with our tools
until the arc of a wheel's hub emerged

and we hauled the trike up from the ground.
When I call Jackpot! the other kids come
running from inside and next door,

drop to the ground and lay around the hole
like spokes to a hub. A shard of pottery;
the slim leg of a doll; empty medicine bottles;

a wrench— we turned them in our hands,
then ran upstairs and dropped the lucre
in the bath to wash away the soil.

I'd wait til there's no moon
and quarry up strangers' fields,
unearth old nails, flakes of glass

or an unticked watch. From a plane above
you'd think the town had left,
having dug up all its dead. One Sunday

I was too sick for church, when they left
I went downstairs and across a field.
I started with the rake, seeking indicators

past the topsoil. Items withhold their identity
til the last minute. I struck a white rock,
trawled away the dirt and brushed its coarse length.

There was a hollow down its side,
I got a hold with the pick, heaved it up
and the horsehead leapt from the ground

with my pickpoint shooting through its eye.
I lay it opposite me in the bath; got it looking
all Sunday-best. I sat at the kitchen table

with the cleaned skull upright and centre,
waiting for someone to come home, to see
what disquiet I'd gleaned from the world.

Margaret Owen Ruckert

Ode to Evaporation

Like wind, you keep us guessing of your form
unseen; you pull all liquids at your pace
lifting silently that mass, a water's
weight, a selfless action bringing praise
from every waterzen on earth; the cleansing
rituals that we keep depend on you—
wash days, when we plant new seed, we feel
your work is never done in cycling through
the atmosphere to cloud and mist, all eco-
systems live in your embrace; your friends
a summer's day, a lifting breeze, and me.

chocolate caramel squares

when maths teachers find the answer
to becoming interesting, they will follow
their instincts instead of Pythagoras
nose across to the Technically Food Department
and elect a committee on 'Working Together'

there they'll begin a discussion on the value
of x as one side of a 'Caramel Square'
to be delivered to maths rooms for checking
the consistency of cut right angles or
measuring an area subtended by chocolate

a pilot student project has already applauded
this theoretically-driven approach to hands-on
mathematics which gives sweet meaning
to solid geometry and a chance
for three-dimensional maths

to be tasted by girls, viscous rumours
of their lack of ability to think above the square
are now well rebuffed thanks to this study
when students successfully assembled
biscuit houses and removed the remains

this sugar mathematics has its hard-ball enemies
who denounce this latest, inclusive approach
to the five senses as a sell-out to materialism
but much like the computer has been hungrily
accepted as an alternative to daily bookwork

originators of the caramel-square theory
are certain as a carbohydrate kick
that educators who introduce the biscuit
into the lessons only maths can cook up
will find success, sweeter than 900kJ per serve

Afternoon in the Central Nervous System

Eating raw cabbage at a paper-littered table at autumn's end
I choose (or something chooses me) to read
an article about biology unclearly,
following in particular the Lamarckian
bit, the easy assault on Skinner
(everybody's enemy, I hope), the
anecdotes about Gregor Mendel's peas
and the delicate paths being traced
through the evergreen mind-body problem,
tracks over tricky terrain as dodgy
as those by which molecular adjustments
carry something from the senses cleanly back
to what I, of necessity, call Us.
We, whatever we are, keep wanting
to know how suppositious self in fact achieves
the confidence to keep slogging on
despite the madly random death of cells
and the rupture of connections.

Eating the noisy taste of cabbage while
a CD plays Debussy's Iberia
and ash leaves fall on the concrete slabs
of our backyard, I am bemused by how
the musing of the world thus chose me here
out of, say, Scottish tribes and the plaited rush
of history from Plato down to NATO.

Why omnivorous?

Why darkish-skinned?

And whence this quaint obsession with ball-games
as well as making verses? The dumb gene
says nothing at all, but sits at home in my soul
writing me still across its illiterate plan:
a singular man chewing some general cabbage,
looking out over the second millennium
and feeling as fit as a trout.

morandi spins a white bowl in a microwave

he didn't know percy spencer who after his lunch break
modified the hershey bar in his pocket while testing
a vacuum tube nothing else i hope
said mrs spencer over meatballs that night.
in the lab perc stood back while corn popped.
the same magnetic tube made an egg tremble scramble
and explode. hot dog! home of the brave! a speedy way to cook
a weenie the radarange: large as a fridge

in his micro studio in bologna morandi contemplates
his natura morta turn tabling the relationship
of object to light. from the top right a shadow brushes
the rim of the bowl teasingly close and far away
his sisters boil chook bones with veggie scraps on the fuel stove
cable stitch for hours while the stock simmers
crack the shells of eggs roll pasta morandi slow cooks
asymmetrical kitchen shadows no nuking no zapping

Nandi Chinna

A Line Made by Walking

After Richard Long

$$L = \{\mathbf{a} + t\mathbf{b} \mid t \in \mathbb{R}\}$$

The breadthless length of a line,
finite in one direction,
sepia toned, fading into
a hedgerow of soughing trees.

Treading the same route;
how many footsteps will it take
to walk a directory into the body?
Routine made visible,

a line from back door
to garden shed, to gate, around each raised bed
of cabbage, carrots, potato and lettuce.
Walking through seasons of tomato and corn,

uprooting dead stalks, laying seed in furrows,
tearing weeds, harvesting, all unsentimental.
Beyond the garden countless tracks intersect,
tracing a cartography into the neighbourhood.

Across the turf of distant countries,
how many steps will it take
to trample grass stems, crush flowers
make a line by walking

H₂O_h

Imagine for a minute a water molecule
spinning several thousand feet above the earth
with its oxygen pulled taut between two hydrogen atoms
each reaching out to another oxygen atom and then
pulling away only to
reach out to another oxygen atom with tender non-covalent grasp
for not even a fraction of several thousandths of a second
and as the electrons stretch yearningly towards the oxygen
which they haven't got the capacity to hold
even as they reach out and bond and break
over and over and over and without ever touching
because they haven't the ability and
the ice they form in turn creates the snowflake;
this snowflake and that snowflake and imagine
they're falling faster now the velocity
sped along by inexorable gravity
which is a major force
yet
non-covalent hydrogen promiscuous bonds from within the snowflake
are not to be denied
except
where that denial forms an integral component of the crystal -
can you even begin to imagine the bonds
and forces between those atoms as the snow falls?

Yet as I stand beneath the heavens completely
bereft of any ability to penetrate
those multitudinous nuclear resonances
I am still caught;
I still can't see through the storm.

Gerry Jacobson

Geotanka

walking past
a pile of rocks glinting
in morning sunlight
only I know it's calc-silicate
hornfels of Ordovician age

dark hidden
outcrop by the lake –
Silurian limestone –
lingering remnant
of the Limestone Plains

imprint
of brachiopods
in the mudstone
under our house
an ancient seabed

Monga
rainforest gully –
plumwood trees
growing out of treeferns –
remnant of Gondwanaland

landscape eroded
down for twenty million years ...
tired rivers
in their valleys ... Woden
Molonglo ... Murrumbidgee

Lake George –
basin since the Miocene –
is that
eight million years
since time began here?

moonwashed night
on a dry lake bed
looking
to distant hills
sense of the eternal

Kate Deller-Evans

Gastric Juice

pumped from my stomach
juice sharp enough
it dissolves gold
houses bugs
crazy for the pH
dismembering-car-strength acid
parts set out in the wrecker's yard

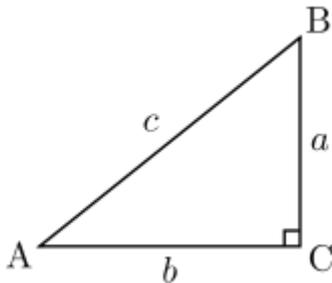
millimetre by millimetre
shedding metal skin
like my guts
cell by cell
sloughing off the lining
just as in oysters
where hourly irritation
grain by grain
sand creates pearls
my ulcer, a flaming
jewel of passion

Sine Language (Languishing)

Sine missed his mark,
failed tangent.
He dismissed the stars,
and ignored angles
while picking short repeatable DNA from his zinc zoot suit.
We were left propping up a *hypotenuse*,
which meant we had to abbreviate *Sine*
& remove *e* to make *Sin* truthful to theology,
not trigonometry - one of his basic functions.
Then we wondered if we should add a (q),
to bring him back to full circle?
But we were depleted of (y) coordinates...

Cosine rescued us!
Her ratio managed to busta a move,
and allowed us time to drag *Sine*
back to his acute angle.

Basic trig saved us...now we have an angle to use as a concrete wave!



SOH-CAH-TOA

Sined.....tri-angle (a Praetorian guard)

Lilith at Crotona

Provided only we wanted to learn
he would teach all who came,
men and women alike.

At Crotona we were free to follow him
through the maze of our own ignorance,
free to search until we came to that place
where art and science met.

And always Pythagoras was there
ready to take us further.

Number is the Law of the Universe he said.

And I saw.

Each number with its own vibration,
its own signature frequency ...
all of creation pulsing with number.
Everything, all of life, radiant energy,
the flux of number.

But, warned Pythagoras, admit no superstition.
No number is better or worse. None
may presage luck, good or bad.
(did he know that I'd sought omens in dropped
knives; had turned coins at new moon – even
believed in an eyelash blown away for a wish?)

Now only integers of the universe coursed true.

With heart and eye I scanned each numeral;
trembling, inscribed its symbol.
To the tips of my fingers listened
for the number's truth, its mystery.
A numerology too elite? Too sculpted
by imagination? Perhaps. In retrospect.

But I don't suppose he had thought so,
or that the spaces we traversed
would ever be closed against us.

John Watson

A Recipe for Sea Water

Over a bed of sand
To 10^5 parts (cold) of H_2O
Add 10 parts (dry) of $NaCl$
And 1 part each of KCl
And $MgCl_2$. With a trace
Of other halides stir and place
In a lunar centrifuge. Shake well.

The mixture you now have is brine
Subject to algination, brackish
And will not keep.

And now *the secret ingredient*
– Essential to convey to the taste
A concentrated solar solution
And make it, in the lash's fringe
Doubly diffractive, and to raise
Glistening to an art –

Proceed as follows:
Add, *in unlimited quantities*, the Past.

John Watson

“Behold! Nature Changes Its Laws...”

And mercury runs uphill
And silence registers on the audiometer.
Mercury recalls its meniscus,

Oil and water decide
To pool their differences.
The perpetual motion machine

Accelerates to the point
Where its cycle is indistinguishable
From rest. Whereupon water gushes

Out of control. Finite systems
Extrapolate themselves
Beyond all bounds.

Water soon to freeze
Swells with pride at preserving
The arctic trout.

Ozone produced at that cliff face
Clouds the mercury released
From the fallen barometer.

A shadow crosses the sun
Preventing its own light.
For a strictly limited period

Time is allowed a tidal function
Fluctuating across the immediate,
Ebbing on either side of the present.

Meteorites at their terminal velocity
Exceed it in a sudden access
Of earthly anticipation.

The inverse square law between us
Falters. More fatally attracted
We are weightless with love.

Pole and polar converge.
Statistical extremes gather
At the tongue of the bell curve

To hear their variety proclaimed.
Irreversible precipitates relent:
Silver halide curds dissolve.

Anti-matter turns in sleep,
Enters and leaves the mirror
By opposing doors, and waking,
Mingles with matter without fear.

Tricia Dearborn

Making Pipettes

Rolling the hollow rod above the bunsen,
blue flame glowing orange where fire embraces glass,
turning it in the fingertips watching for something
almost ineffable, the particular shine that denotes
a particular malleability.

Then taking the rod from the flame
and in one swift motion stretching it,
six inches for a pipette (if making
capillary tubes, the full arms' length
as if to say 'This far! to a sceptical crowd).

If attempted prematurely, it will force a sluggish length
that cramps up again too soon;
left too late and the rod's slack belly
will droop into the fire, irreparably deviate.

Once the tube is cooled, take a file
and make a nick
at mid-point where you will snap it, rendering
two tiny mouths wide-open; fitting to the other end
a rubber bulb, a lung, to draw up some solution
that mustn't touch the skin.

Patience, narrow observation and precision are required
to forge this least precise of measures.

A certain dramatic flair merely adds to the pleasure.

Tim Metcalf

1,1,2,3,5,8,13,21,34,55,...

1

From
The
Flowers'

Petals spring
Open before us

Nature's spiralling equations

Intricate rhythms forming from simple sequences

From the single seed to the sunflower's face to the waving field of splendid yellow
The golden centre of the picture that rapidly expanded from the big bang through all
time until the mind of the mathematician

Fibonacci whom they called the Blockhead who found a way that nature might have
made its breathtaking rush to the Infinite that pervades our lives that at every step
confronts us and falsifies our equanimity

That is the ever-receding-before-our-science repository of fear and of beauty...

...containing the threat of innumerable possible points of departure from every event.
The other way we could consider this is to say that randomness terrifies us that our
true desire is to dismantle it into predictable portions to analyse the flickering dark
surrounding our fires' light

Using Quantum Mechanics to calculate our tunnelling unscathed through black
uncertainties those moments into which the tiger might leap
And Chaos Theory to steady our pulse that with the forests' fractal branching trembles
Like the hands of ancients who accepted without sums
Our simple human need to grasp
This unruly world
And reduce
It all
To
One.

Steve Evans

Zero

maths' greatest invention
is nothing much
not the Zen of empty mind
like still water drawn somehow on paper
zero is too full of itself for that

it's the dumber half of the Binary Twins
its vacant expression
is like the open-mouthed 0 of a holy dollar
or a well-hole reflecting a night sky
that dreams of naught but itself

it doesn't envy positive and negative
it's undizzied by endlessly looping the loop
and it runs rings around my circular logic
it's already everywhere
waiting

I hear its drone
a dull siren of white noise
as it hums towards me
a hoop-snake rolling the long road
to wheel away days

when I turn out my pockets and
fill my hands with nothing
or stand in a doorway
forgetting why I've come
zero, laughing, says 'welcome home'

Biographical Notes

Magdalena Ball runs The Compulsive Reader. She is the author of *Repulsion Thrust*, the novel *Sleep Before Evening*, *The Art of Assessment: How to Review Anything* and four other poetry chapbooks.

Julie Chevalier is a Sydney poet and short story writer. Her poetry collection, *linen tough as history*, is due out late in 2010.

Nandi Chinna's first poetry collection *Our Only Guide is Our Homesickness* was published by Five Islands Press in 2007. She is currently a PhD candidate at Edith Cowan University in Western Australia, writing poetry about wetlands and walking.

Tricia Dearborn has a BSc in Chemistry/Biochemistry, with Honours in Biochemistry. Writing and science are both lifetime loves. Her first collection was *Frankenstein's Bathtub*, Interactive Press, 2001.

Kate Deller-Evans is a part-time lecturer in the School of Computer Science, Engineering and Mathematics at Flinders University, as well as a poetry and verse novel writer.

Steve Evans teaches at Flinders University. He is a freelance editor, reviewer and manuscript assessor and literary editor.

t w gee writes with OOTA at Fremantle Arts Centre. She attempts to meld words to entertain and provoke interest. The poems here are from her SF novel - *Erth*.

Anneliese Gillard, known to her friends as The Scientist, is fascinated by the complicated technical laws behind our existence and likes to write about them.

Gerry Jacobson lives in Canberra. A retired geologist who thinks of himself as an aspiring young poet, his tanka have been published in poetry journals.

Yve Louis has published five poetry collections, most recently *The Yellow Dress*, Five Islands Press, 2005 and *Notown*, Blue Tongue, 2009. She lives in Armidale.

Dr Tim Metcalf has often tried to reconcile poetry and science. His most recent poetry collection is *The Effective Butterfly*, Ginninderra 2010.

Mark O’Flynn has published three collections of poetry as well as poems in most of the Australian journals.

Margaret Owen Ruckert, educator/poet, is a former TAFE Science teacher. Award winner. Her book *You Deserve Dessert* focuses on sweet foods through the lens of poetry.

John Watson is the author of *A First Reader, Montale A Biographical Anthology, Erasure Traces* and *Views from Mount Brogden etc.* He is a Puncher & Wattman supporter.

Andrew Slattery’s first collection *Canyon* was published in 2009 by The Australian Poetry Centre. His poems appear regularly in Australian, North American and European publications.

Chris Wallace-Crabbe, poet and essayist, has sixteen volumes of poetry, a novel, and numerous prose works. His *Selected Poems 1956-1994* (Oxford University Press, 1995) won the Age Book of the Year Prize. His latest book is *Telling a Hawk from a Handsaw* (Carcenet Oxford Poets, 2008)

Credits

“1,1, 2,3,5...”: Tim Metcalf, *Redoubt* magazine, Canberra, 1993.

“10 Digits of e”: Magdalena Ball, *Repulsion Thrust*, Be-Write Books, December, 2009.

“Afternoon in the Central Nervous System”: Chris Wallace-Crabbe, *Selected Poems 1956-1994*, Oxford University Press, 1995.

“Lilith at Crotona”: Yves Louis, *Lilith’s Mirror*, Kardoorair, 1999.

“Luminous Fruit”: Steve Evans, *Luminous Fruit*, Bookends Books, Unley, 2003.

“Making Pipettes”: Tricia Dearborn, *Frankenstein’s Bath tub*, Interactive Press, 2001.

“The Allotropes of Tin”: Mark O’Flynn, *What Can Be Proven*, Interactive Press, 2007

“Zero”: Steve Evans, *Luminous Fruit*, Bookends Books, Unley, 2003.

About This Project

Science Made Marvellous is a national collaborative poetry and science project initiated by the Poets Union Inc working in partnership with National Science Week 2010, The Royal Australian Institute of Science (RiAus), The Australian Poetry Centre, The State Library of NSW, WritingWA, The Northern Territory Writers Centre, The Queensland Poetry Festival, The ACT Writers Centre, Friendly Street Poets and The SA Writers Centre, The Tasmanian Writers Centre, Hunter Writers Centre, South Coast Writers Centre, New England Writers Centre, David Musgrave of Puncher & Wattmann and Judith Martinez of Bird Creative. This significant collaboration sees a stellar program of events running across Australia in capital cities and regional centres to celebrate science in poetry with collaborators hosting events involving poets, scientists and the public, with an accompanying audio program being broadcast in local and community radio stations and available as a download from collaborators' websites.

For a limited period, from National Science Week 14 August 2010 until 30 November 2010, the three print titles in the Science Made Marvellous Series will also be available as a PDF for free download from collaborators' websites including the Poets Union at: www.poetsunion.com.

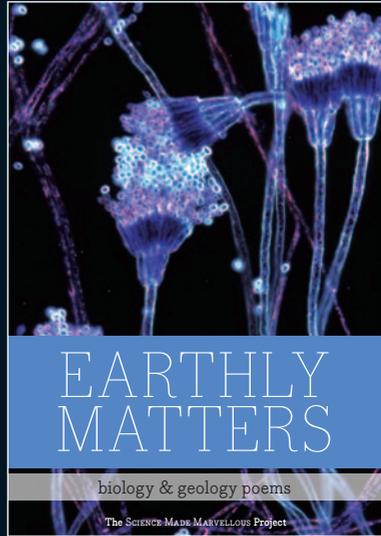
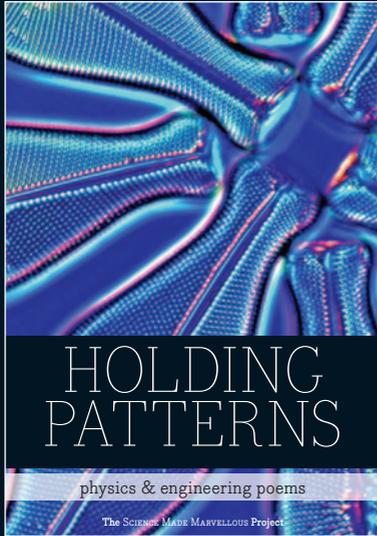
The Editors

Thanks to the editors Dr Victoria Haritos, a biochemist who leads CSIRO Entomology Division's Biological Chemistry Team and Brook Emery, Chair of the Poets Union, who have selected the poems in this volume, and the accompanying volumes *Holding Patterns* and *Earthly Matters*, of the Science Made Marvellous Series. Carol Jenkins, as Project Editor, has put together all other text and materials for the Science Made Marvellous Series.

Cover Image

The cover image of *Lepidozia* shows this liverwort's spores and elaters – elaters being the spiral tubes that act as springs, or like poems, to send the spores out into the world. The image is used with kind permission of Ron Oldfield.

Ron Oldfield is a Senior Research Fellow, Department of Biological Sciences, Macquarie University. This photomicrograph is part of a body of work that reflects an elegant union of art and science. Technically brilliant, his work is a product of teaching and research that has won the Eureka Prize and many international competitions.



These three slim volumes in the Science Made Marvellous Series show off the rich entanglements of poetry and science. They celebrate science with poems that are concise, witty, observant, wondering, and warmly appreciative. Here is poetry not just as litmus, measuring science's absorption into our lives, but poetry that experiments with science, in all its complex variables and hyperbolic hypotheses.

Carol Jenkins
For The Poets Union



The Poets Union Inc

