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Sol and the Rockettes

by

Samantha Bauder

A Creative Writing Project

Submitted to the Faculty of Graduate Studies

through the Department of English Language, Literature, and Creative Writing

in Partial Fulfilment of the Requirements

for the Degree of Master of Arts at the

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2017

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Sol and the Rockettes

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Abstract

Sol and the Rockettes is a collection of poetry exploring our solar system and many of the lesser known qualities and characteristics of planetary bodies. The poetry relates these characteristics through a combination of scientific language and a mishmash of conflicting metaphors; this includes an overarching family structure, which describes the planetary bodies as human-ish figures, with human traits representative of their physical traits. The accompanying essay, “Building a Home for Readers in the Unfamiliar Territory of Space,” details the relationship between science and poetry in a few select works (Mary Barnard’s *Time and the White Tigress*, Christopher Dewdney’s *The Natural History*, and Christian Bök’s *The Xenotext*), and examines, in particular, the techniques used to integrate science in poetry in meaningful ways, in relation to the techniques used in *Sol and the Rockettes*.

Dedication

To family, old and new.

Acknowledgements

I would like to acknowledge everyone who helped me through this project; thanks to my family for supporting from a distance, thanks to my friends for supporting from up close, and thanks to Louis for helping me shape this poetry into something worth reading and mulling over.

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Sol and the Rockettes

Prologue

Dear Grandfather, who prevails throughout the heavens,

Hallowed be your aims to order the universe;

Your will be done, your pawns spun and threaded into one great mobile suspension.

Thank you for giving us this day, our light mother Sol, and the ground on which we walk.

Your brood formed of the dust of the first stars, molding marblesque into living matter.

Your progeny forgiven for the pinball of their youth, as they forgive the entropy of their predecessors.

Stella to ashes, ashes to planets; unto dust returning, while you remain.

We ask that you continue to guide our orbits and lead us not into singularity; may the wells be trivial and the escape velocities attainable.

In your name,

gravitas.

SOL

I sit on the edge of my bed, a stream of photons bouncing off the windowsill to warm my face. The sunflower on the ledge glows with spectral absorption and its petals reproject sunlight towards me at a wavelength corresponding to a “Tuscan Sun” shade of yellow.

I wish I could follow my window’s beam back to Mother Sol. The journey would be emptiness reducing me to scatters, tongue twenty kilometres from fingertips, skin translucently revealing distant stars and Venus transiting across stretched membrane: me as canvas, the solar system mapped onto skin.

Me in Mother’s lap, crushed in her heat; plasma like memoryfoam knows my atoms and bonds, Terra melting away with my eyes. We reminisce of last epoch’s atomic arrangement, of our ancestors, Grandmother Stella and her children. How many children did you have, Grandmother? Did you eat them at the end of your life like a hamster does its young? When you bequeathed us your familial home, you only left us half-clues about who you were (a swath of carbon by the stove, a hydrogenous handprint on the counter, an ashtray of burned photographs).

You lived before the days of Venus, Luna, Zeus; before Mother rose from your ashes.

Can we see our future emulated in Stella’s past? She and Sol an experiment conducted by the cosmoi to examine stellar genetics. What if we existed among Stella’s children long ago, a mirror to our present selves? Time a back-and-forth motion of prairie grass in the wind, the rewind on a cassette. Are you Stella, Mother? Do you remember your past lives when the tape plays forward, or is your memory wiped each time you expire? Astra, Stella, Sol sweeping up the mess of ancestors’ stardust, only to combust and burn out later on the kitchen floor.

Synchronized mother-and-daughter exhale,
hydrogen and helium flaring,
carbon-and-oxygen breath
cold in the shadow of her fiery plume.

8.32 minutes of daydreams, my consciousness travelling at the speed of light from Sol back to Terra, and I wake in my bedroom, Mother still peeking through my window. I wrap her sunbeam around my forearm, open palm offering handfasting, light sinking into skin in photosynthetic union. Renewal of primordial vows passed down by ancestral eukaryotes.

In exchange for Mother's gift, we worship Dažbog, Gun Ana, Nanauatzin, Nahundi, and the morning. Anyanwu, Wuriupranili, Helios, Malakbel, Beiwe, and the rainbow. Étaín, Inti, Tamani-te-rā, Ravi, Ah Kin, Xihe, Kinich Ahau, Amaterasu, Hvare-khshaeta, Sué; the flowering iterations of Sol. A covenant formed between mother and her living children, passed through reincarnations of carbon and vivifying solar energy.

Don't grow cold on us, Mother.

Solar Mother reaches out, transforming from fixed fire to rays, radiating through flat vacuum until she dips down over her children nestling into their gravity wells, tucked into their spacetime beds swallowing light, her toes, her fingers. She is here and there, brushing love across her house as her myriad children await simultaneous imprint.

Premier satellite lost in the void savannah until mother curls around planet; she lights him, a child's mane of golden petals.

Welcome Mercury.

IN-BETWEENS

cosmic embroidery

weave

of gravity

waving

covered in

jewelled beads from

$^1_1\text{hydrogen}$ to $^{239}_{94}\text{plutonium}$

sink into the fabric, puckered wells

portraying pictures and patterns and planets

over the homogenous underpinning

embroidered cosmos

MERCURY

Mercury is a field of sunflowers, baking under coronal energy. Sol's flora shoot up out of the (s)mothered hemisphere, sprouts jutting from iron at dawn and spreading roots across the Mercurian surface. Golden petals follow, replicating forward, washing over the craters three metres for every second-hand tick.

Rapid growth and regrowth agitating dirt daily, heat seeping from flower heads into rooted trails to re-birth ashen volcanoes from the magma up.

Blooming light's ingrained, but night catches up, a hemisphere of shadow. Mother symmetrically retracts her favour in a progressing flash-freeze over the same jutting iron, three metres for every second-hand tick, sunflower heads falling to the ground as blackening shadow. Would-be atmosphere freezing to solids and dusting the ground with snowing krypton, xenon, and water in trace amounts, until dawn shifts in again.

Mercury runs laps around his universe, Mother's house, like a tiger beetle scurrying underfoot, trying to win in a race with his siblings. Does Jupiter see his tiny shadow, does Mars? His gentle taps on his brothers' orbits go unnoticed as they fight for Mother's affection. They never look down other than to correct their calculations, to write Mercury off as a technicality. A grainy speck on the photo finish.

Lonely little brother plays shadow puppets on Mother's face. A tortoise, a hare, a beetle.

He paints the tiled floor with his hands, charting his elliptic course around Mother. Orbit a recessing spirographed doodle, flower-petals scribbled in cosmic background. One day he'll complete his thousand-arc loop, Sol's kitchen tattooed by his orbital fingerprints.

Pocked because he doesn't have the thick skin of his brothers. Mother had licked his wounds like a heat gun, volcanizing the plains long ago, but he turned the other face in masochistic embrace to the bombardment.

Meteoric bullets fly at Mercury's target-painted face, rolling down the gravity swell like marbles to strike the stone-faced visage. Meteors burrow into the dermis, worming, pushing aside crusting bedrock in molten pressurization, melting and reshaping bone into hollow cheeks. Meteors, exhausted, leave only their cratered graves. Petals sprouting on the rupes, funerary art scrawled in exotic matter in the shadows.

Limping Mercury suffers scars as a bodyhive carrying dead organisms in every cell, bullet wounds healed over, with the poison inside.

Caloris ⁱmpacts, converting calories from kinetic to high force impact, shockwaves deforming
as Caloris, the meteoric crash king, flattens his palace basin out of the side of Mercury's face.
Mercury ripples, tidal-waving stone straight through the ribcage, his backbone spining,
mountainlike, in an antipodal echo. His chest, concaved; his back, convexed.

At night, Mercury exhales his shallow exosphere, hot breath sucked by the parasitic exo-vacuum.

it gnaws his face,

suction sealing

his lips, his nose, his ears,

stealing

his huff, his wheeze, his rattle

the void goes

inhale ; d i s s i p a t e

IN-BETWEENS

sound travels only through space's painted volumes;

noisemakers push atom into atom, pigment into pigment,

equalizing vibrational frequencies through the onrushing wave,

voxels extending up, down, strange, charm, top, bottom, systematic until

blank canvas

silences

VENUS

Venusian hum,

a reverb between bouncing CO₂s.

Thick like pea soup,

acidic scent of flesh burning

nostrils,

Welcome Sister Venus.

Miasmatic brimstone storms

dusty yellow flurries shaken up and stirred

in a glassless globe bound by gravity;

narrow cracks whistling a jaunty tune—e e, ee e H⁺, H⁺

as the quick slip out

H⁺, e

H⁺

H⁺

H⁺ e,

H⁺

H⁺

H⁺

e

eee

flies trapped in fell eden

vestal womb

amniotic sulfur stirring science fiction greens

house of the wild womberman

gestation in jest

pseudogoddess' pseudocyesis

she bides her bitter time

volcanic underbelly undulating and

obstructing impregnation,

lava weeping to sooth her mourning sickness

immaculate plains to repetrify her pseudosmile

eon

hush, dear

after eon

Venus hoarding photons and rays to set off on her own,
greenhouseshelter prepped,
thick-skinned comfort for an anti-nuclear winter.

Mother, monitoring the terms of the covenant,
jealous of self-sufficiency,
unsheathes her solar winds,
claws skin, shredding clouded cotton, flaying strips
of huddled Venus

sending flowers,
a note,
“I will s(h)un you”

Venus runs through the kitchen, dusty living room, foyer, kitchen,
ducking past her big brothers to hide from Mother,
spinning away counterclockwise
until Mother meets her face-to-face

tugs her hair
strips her down
bares her dermis to space

Science, please:

particulate explorers dressed in quarksuits,
ready for the vastness
a stray O floating, mooning, glowing
photoradiation out of the deep dark.

Hold on to your helmets, little ones;
take this planetary accelerator and
zip down a corkscrew runway
whistling, $e^- e^+$, $H^+ H^+$, $e^- H^+$

the ride to the edge of the universe is just beginning

Thank you, Science.

IN-BETWEENS

hold your breath tightly, reader,

or release it like ashes over the solar system,

carbon atoms bonded and carried by oxygen, zeppelin drifters;

carbon branded by you,

atomic memory

TERRA

Terra journals her to-do list for the day:

Sweep the floor – check

Check the locks on the door and window – check

Check again

Check for incoming radio broadcasts – only twice

Spy on the siblings – at least three times

Make sure no germs have left the room (reinforce quarantine borders)

Thank mother for breakfast – check

Make sure Luna got her rabbit feed

Check the door flap for escaped germs

Search for extrasolestial life

Record findings – in progress

Check to-do list

Terra leaves her journal open and sries through her window-mounted telescope at the neighbouring houses. She wishes for a better view, a second storey window in her family's one-storey home, because the houses have aligned and she can't see past the brick façade next door. She turns to stargaze, seeking another planet like her, someone who searches, someone who calculates, someone else from whom she'll have to quarantine herself.

The house is filled with thunder and the lightning flickers. Terra peeks through the door's crack into the hallway as the other children bolt by, and she shuts herself back in. *They're wild out there*, she thinks. *It's them vs me*. She holds a safety blanket and a pacifier. There's Terra, and anything beyond her room is space, it's "out there." *It's them vs me*.

When Mother's in the kitchen, when Venus and Mars are sleeping in their neighbouring rooms, Terra feels most at home. She yawns and stretches, temporarily ignorant of her siblings' activities. A mobile hangs above her head, swinging planets with familiar faces. There's a rumble from the kitchen as tomorrow's food is prepared in the macrowave, roasted sunflower seed salad, solplant parmesan, crème brûlée.

As night passes over, Luna illuminates the room, a cottontail bunny engineered to be a nightlight. Terra holds her close to fend off the dark.

Terra weeps helium, the tears seeping to the edges of her skin, held back by her gravity, the self-restraint taught by Grandfather. A draft from the window sneaks in and steals a kiss, scraping off surface tears from nose and chin and whirling back through the glass, into space.

None of her siblings seem to remember Grandfather, his apples, his tight hugs. She hoards his heirlooms, the ones she found buried in an old chest; she maths them, she memorizes his face. She studies his textbooks and builds on his legacy.

Terra has sculpted some alien dolls out of the bed frame and she's built a mech population to help her keep track of her siblings but she's running out of the gas and the phosphorus and scandium and terbium stored in her deep closet. She's stuck with the same fixtures because nothing's coming in but photoprotein and she's depleting the same resources by sending them outside, but she knows it's not enough to keep her advancing forever, she knows it's not enough to keep her curious forever, it's not enough to keep her living forever, it's not enough.

Wash the hands, wash the hands, wash the hands. Wash the drones, wash the drones, wash the drones.

She's filled the corners of her room with satellites and antennae listening for any sign of neighbours (she's yet to hear them next door) while her siblings sleep. The incoming transmissions remain silent but she hears voices as she lies in bed, an overlay of thousands of voices, images and songs. The gizmos she's built carpet her room, twirling, whirling, blinking, and beeping, and she whistles softly in response.

On her desk, sheets of Hubble-printed b&w snapshots. She traces every line, memorizing distant stars and colouring, purple for wishes, blue for hopes, orange for dreams. She carves a halved heart in the windowsill as she looks out, Terra on one side, a question mark on the other. She carves a rocket out of scrap titanium and gold. She opens a glass door in the window and sets off the rocket, carving a path to the distant stars on the sky-ceiling, carving a hope in her heart of distant earths.

Terra shrinks into herself, a fever growing. In a waking dream, she feels the back of mother's burning hand on her forehead. A hallucination, surely – mother can't be in here, not here, not touching Terra. The sheets are burning up with her skin, her wrinkled skin dehydrating, crinkling, folding upon itself in the blaze

and she snaps up,

skin wet with a cool sweat,

Mother peeking in through the door,

but not closer

In the morning, Mother knocks. Terra peeks through her spy hole as she nervously strokes the line of deadbolts and swing locks on the left. She fetches solar sail drone IKAROS and pushes it through the food flap, set to auto-orbit and transmitting two ways. Mother holds out a platter of burnt toast and orange juice. IKAROS bleeps once, for Mother, and Terra watches as the door flap opens and Mother pushes part of the platter through. Terra pokes the crusty edge of a toast piece before pulling the tray the rest of the way through, taking it to her desk, and consuming. She hears Mother's footsteps retreating, the solar drone still catching her thermals, in sync. She watches through its camera as Mother brings breakfast to Mars, Jupiter, and the rest, and then signals the drone to return.

IN-BETWEENS

a human

stands on a precipice,

sun opposite,

driving its shadow out from under it,

two arms, two legs, and a head

detaches from its feet and melts away,

bleeding into the cliff face

MARS

rust brother,

barrel rolling on empty, scores another tick into cracked skin

the last moisture leaving a parched desert tongue, oxidized exhale,

rust breather

distant reverberations dustcloud his vision

he flashes back past the arid lightning that storms now:

before Mother stole his breath,

Mars, happy,

danced rain on his own splashpad

solar breeze, with every pass, pulling the hydrogen

from Martian lungs

diurnal asphyxiation

water world on fire

Mars, drying

curled fetally around his lingering northern oceans

Arcadia, Acidalia,

Utopia evaporates

leaving naked Mars with his dry iron blood

lonely winter dew

an ice cap or two

the roses are blue

Mars, propped against Olympus,

plucking yellow petals

she suns me

she shades me

counting granules in the rain barrel

one dust

two dust

red dust

blue dust

she strips me

she bathes me

crumbling to dry stasis

hourglass figure,
waist belted by fine-graded erosion,
the beachfront

a duststorm trudges up the coastline,
taking his measurements,
up one leg and down the other,

overlooking

to the north, a gleaming basin, moisturized and babysmooth
skin unveiling Utopian remnants,
sedimented tidal channels and surfaced scars
like a tattoo

temporal tide

to the south, the sand is fitted with
Mercury's genes:
overexposed and chapped, stale, thirsty,
pores choking on dry skin and prone to meteoric outbreaks

Mars fingerpaints,
adding to the mural of Olympus at the foot of his bed
mixing pigments to try to paint a blue sky

he dips into red, and brown, and carmine
with dust mixed in for texture,
acrylics turning to mud on the plaster

he attempts tears,
he knows there's blue in the water,
but they cling to his eyelashes, transparent,

and evaporate before hitting his palette

ASTEROID BELT

every morning,

Mother makes her way to the conservatory,

sun shining down on the greenery

seeds aerosol,

floating across the room,

motes clinging to photons

and planting,

and sprouting

Mother backscattered

the greenery

carpets

sticks and stones

sample 1, Ceres:
fleshy rind locks in an ocean,
Sol's prima plant and
agro-genitor

sample 2, Pallas:
panax zhìshénxīng, cure-all
growth inclines away from
ginseng wisdom's
ancient roots

sample 4, Vesta:
brecciated bark
bare branches

sample 10, Hygiea
c-class plum
crusted in chondrite's
aqueous alteration products
burnt dew

JUPITER

weighed down,

a heart, heavy, from

stardust to “giant”

Mother, so small from here, still dwarfs her failure-of-a-dwarf-star son,

her failed sun

Jupiter crushes his failure, incinerating internally,

core combusting deific daydreams and desires

Jupiter, covered in rosaceous blemishes,
plays a naming game—

Great Red Leech

tiny teeth worming downward into Jupiter's airy skin,
heart-seeking missile leech swallowing deeper and deeper,
 flesh floating into its jawless maw
through to its tail, buoyed,
reddening as it circulates in its own current,
devouring Jupiter's subcutaneous tissue

Leech Jr.

found where the going was good and got going,
baby bloodsucker sustains
the flea, the leech, the louse

Jupiter's got bugs in his pores

sink down into hot, dense slush

Jupiter takes an ice bath but the fluids melt into his skin, amplifying the fever

at his heart, pressure forms a pearl of mercuric hydrogen, wound in newtons and kilopascals and
atmospheres

the distinction between heart and body,

between skin and bath,

impalpable,

a fluid gradient from liquid soul to its ascending steam

does his heart ripple at the nonedge when Mother warms him?

bubbles molt on his chrome core

Jupiter runs up to Mother when she gets home from the hospital with baby Saturn, shoving aside
the toys he'd left in the hallway, making a path for himself
in meeting,
catalyzing Mother's field of gametes.

Did you father your siblings, Jupiter,
did you unspool your family's lineage and wrap it around Mother's legs,
did you tie it in knots and loop it around yourself?
one generation, one Mother

Saturn calls for a grand adventure away from home and
Jupiter tacks, running away from Mother, responsibility, his sibling-children,
settling into an orbit in the basement as baby brothers and sisters get the first light, his birthright

jealousy,
or shame
Oedipal Zeus

Mother projects the shadow of Mars' Olympus onto Jupiter's broad face,
branding the prodigal Jupiter's exterior
inferior,
replaced by his own son

a toga clouds his figure, swathes of puffed hydrogen flowing in the thermals

icy ammonia shoulder forward, shroud cold and pungent, god aloof in the midst of his harem.

burnished royal bands mark his figurehead, self-wrought

crown

or crowned?

haloed drifter

your closest lovers float in a gossamer sea, in your bed,Adrastea and Metis, Amalthea and Thebe

curtain canopy flutters overhead

but your love chips their skin, Ganymede's and Callisto's and Europa's,

cells breaking off and painting the sky with disintegrated matter

and Io's volcanic jealousy

what a clandestine aura

your mistresses leave,

trailing evidence in their wake

“King of Planets” falls short of godhood;
he’s got the name and the mane and the roar but he’s still living under Mother’s Pride—
he’ll never grow up enough to have a Pride of his own,
to be the Leo in the sky;
even his children aren’t really his,
each a product of combined gravities and pre-existing semi-haploids

so he stays in the basement
and paints pictures on his ceiling,
throws glow-in-the-dark stars at the walls,
his screams transmitted visually
for those who can see them

IN-BETWEENS

absence shivers

SATURN

Saturn looks up to his big brother;

planet see, planet do

he's made himself Jupiter's copy,

the crown copied too

self-proclaimed king of the gods

geometric storms ballet in a hexagonal ring,

cosmic theatre

Terra spies through Hubble's eyes

seasonal production: Blue Winter Blush

Saturn has written the script and cast the players,

starring

H₂ as itself

He as itself

with guest appearances by

NH₃

PH₃

C₂H₆

Saturn puts the players in their pit and watches his play play out,

waits for summer to put on his next show, just for Mother:

Honeyed Summer Haze

a calculated display of warmth

Ancient Widower

congratulations on your engagement

(too late) again?

your loves

a dead ringer

for some moon that you used to know

beloved

siren on the strand

calling meteors to their destruction,

flaying icy exteriors as you charm them,

deveiling rocky hearts;

they warm up to you.

puppeteer pulling gravity's strings

to form unions of illusory love,

core meets swirling H-He matrices

core meets core

a long engagement

not having said "til death do us part,"

not being parted by death

serial fiancé

betrotted betrayer

Enceladus' icy eruptions ringing in your ears,
not one ring but a concentric myriad
tenuous and flimsy next to their king;
bands inscribed with lovers' crumbling skinprint

your siblings see you as a mantis, preying;
their gazes affix to your rings,
a pile of rubble corpses,
while you put on plays and cry out for attention,
while you lay bait

Terra, out of curiosity, examines the rubble in which Saturn shrouds himself,
the debris piled neatly,
like crop circles, the patterns appearing from a distance,

Terra's Cassini-bot settles into the gaps for a close-up
of sprinkled skin cells, hair follicles, blood vessels in Fe, Ni, Si

Cassini observes, Terra calculates:

the rings, in layers, built up to a fraction of an eyelash in thickness next to Saturn's hulky body,
ghosts which he can't squish to nonexistence as they wreath his waist

bodies ground into particulate,

a belt of bones

IN-BETWEENS

a comet skirts,

skating a trail in the icy sky,

a pirouette,

a double-axle,

reaching out to the awed crowd as she swings by the stands

for her big finish,

she skates straight into the sun;

arms and legs extend, casting a bright shadow

as she expires in blue light and white dust

URANUS

with a
heart of cold

curled in bed, on your side, you stare out the window
the naked sky
your reflection
pale blue

the little ones get all the blankets and mother forgets
you
comatose child, unblinking

mother makes her way to you, downstairs,
but she takes so long—

your nerve endings glow green cold
when you imagine Mother coming down, hand extended to you,
hallucinogenic lights travelling on your brainwaves,
blazing across your corneas,
a false day

—you've grown up in the interim

you've grown up sideways,
around the neglect,
into twitching dreams of an alternate reality

do you see the pink of filtered sunlight when you close your eyes?

Uranus clings to his brother's leg,
emulates Saturnian scripts
in poetry and plays,
writing characters into existence:

Oberon and Titania at the door, bodyguarding,
adopt Uranus
he clings to their fingers, and he swings;
Oberon taking incoming meteor hits,
Titania, as substitute mother, lighting him with her plasma tail
he basks

Uranus writes himself a dependant; Little Miranda curls up over herself to bury her scars, faults
and canyons running over her skin; Uranus writes himself as the hero, worshipped, as he holds
her in his arms, her suffering stabilized.

Umbriel sits on top of the monkey bars in Uranus' imagined playground, alone; Uranus writes
himself as the only friend, worshipped, as they play grounders, hopscotch, tug of war. Sometimes
he lets Umbriel win.

Ophelia and Cordelia herd their flock of courtiers in concert; Uranus writes himself as the Sol,
worshipped, as his ladies circle 'round and 'round, their heels digging dirty, ringed tracks into the
carpet as they circle and circle.

Uranus, pen in hand, writes a chorus of thralls crying in harmony for his attention.

a hand grasping brothers' coattails
a fetal position, rolling end over end in shadow
of Saturn, Jupiter

why so blue, child?

isolated by daydreams, lost in bodies
drifting
the door to his room somehow lost, drifting away from the hallway
he watches the stars go by outside his window
for Mother

why so pale, child?

reaches out for Neptune's hand

IN-BETWEENS

stretching between orbits,

fingertip 149 600 000 kilometres from proximal phalanx,

palm translucently revealing distant Mother

it's hard to grasp when your molecules are so far apart that objects pass through your hand

NEPTUNE

Neptune holds Uranus's hand and protects him from the outliers –
the shadows in the closet, the basement's beasts

but he doesn't catch them all

the ghosts pass by in front of his face but his hands swipe through them, incorporeal

maybe Neptune's the ghost:

another illusion projected by Uranus to break the lonely

he watches the stars dance next to him,

Mother forgotten

Neptune's rings, ghosting,

flicker over cosmic background

they gape

arcs

drawn with a toddler's attention span

was it Uranus? crayon in hand?

like somebody forgot to finish decorating

but slapped happiness on by name,

liberté, égalité,

a phantom fraternité (pretend brothers for you, Neptune)

wallpaper sags next to bare drywall,

Neptune's bedtime backdrop

Neptune visits the backyard by night,
takes a dip in the fish pond,
submerges and heats the water with his body,
counts koi:

Nereid,

Thalassa,

Despina flitting,

third-generation fish inheriting names and scars

and adopted Triton, circling ever closer

waits to snap up dinner

tethered to home, he falls to bed,
wrapped in his oceans of methane,
counts koi:

Galatea,

Psamathe,

Neso,

circling his head

descendants of his childhood mobile,

Triton orbiting ever closer

Neptune, a swirling mass of gas and hot ices,
surrounded by dry moons and half-rings

he islands

sharks ghost past in the brackish waters,
Pluto and Orcus intertwining their orbits
around Neptune's spectral set-up.

Neptune winds his winds to drive them away,
insulating,
forming a shell around but not beyond.

he pirou-waits, motionless,
as the music box turns around him,
the room spinning until he closes his eyes.

KUIPER BELT

once in a while,

Mother makes her way outside,

sun shining down on the greenery

the plutoid farm

where she scattered mixed seed,

a crop rooting in the gaps

succulents

sprouting out of arid space and

watered by a rain of chipped ice

sample 90377, Sedna:

a driftseed blown in from the unknown

germinating in her garden and

sprouting back out of bounds

sample 90482, Orcus:

out of blooming phase with the Plutonian cluster,

Orcus flowers at dusk

sample 134340, Pluto:

plant clustered with epiphytic growths,

Charon, Nix, Kerberos, Hydra, and mossy Styx creeping over the stalks

sample 136108, Haumea:

Hi'aka and Namaka pollinating,

Haumea's eggy fruit elongating over the long summer

sample 136472, Makemake:

photosynthesizing alkanes,

sun receptors constructed to produce

planted propanes

Kuiper products space out,
hanging plants suspended from the trellis
Mother walks between,
counting joy:

Quaoar

2014 UZ₂₂₄

Eris

they undulate
on their pivoting hooks,
hooked into their orbits,
hooked over the stitches in the spacefabric

OORT CLOUD

parsec

parcels

buzzing dim;

noise,

the dust that coats lung interiors

grey matter wreathing

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune,
wrapped in oort like cellophane over a giftbasket

the house, the backyard and sidewalk preserved

as a wax observatory

waiting for guests

oort circles idly,

neutralizing

by assimilation

a field of forgetting

and

the family illusion fades.

just rocks

some wet

some hot

some windy

some not

SOL (Epilogue)

what is the tensile strength of a sunbeam?

does it waver in the face of principal uncertainty?

you, Mother, in your middle age,

your millennial children still living at home

your halfway life only growing into brighter, hotter love

engulfing Mercury, capturing Venus, grazing Terra and superheating,

face pressed against the gravity to reach us

slowmotion stretching to the outer reaches,

Pluto, in his cold fame, and the rest

the sun grows up between the cracks in the sidewalk
and you, reader

did you not expect to find her here,
wearing carbon and chloroplasts,
sunblasting your feet?
well, mother looks out

and in
ternal fusion^{proton+neutron+positron}
just the everyday, unnoticed
we look out

light bleeds over the margins, and up
to the shy, the quiet, the orbitally inclined

the sun is on the planar horizon;

I fall towards her but never get closer, always lateral, always
a fixed distance;

I never look away

I can't look away because love hits the retina from every direction

(or brands eyelids, a blinding pink)

infinite reflections of Mother, 8 minutes old or

8 million, stored by Terra and presently converted,

my eyes absorbing,

windows to the Sol

Building a Home for Readers in the Unfamiliar Territory of Space

My thesis, *Sol and the Rockettes*, falls into a category that I will call “science poetry,” poetry that includes science. By poetry that includes science, I am referring to works which promote the scientific method or a scientific worldview in some way, rather than to those many poems which may use scientific terminology as embellishments, without the weight of the actual concepts being carried through.

Some years ago, science philosopher and professor of mathematics and physics Alan Sokal published a hoax paper titled “Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity” (1996); the article is a parody of theorists contemporary to Sokal (including Jacques Lacan, Julia Kristeva, and many others), who were writing in a wide range of fields and engaging in “a cognitive and cultural relativism that regards science as nothing more than a ‘narration’, a ‘myth’ or a social construction” (Sokal and Bricmont 1). “Transgressing the Boundaries,” similar in form to the papers it mimics, uses quantum mechanics as a base to construct an analogous theory of “postmodern science,” in which there is no “objective physical reality” that can be empirically determined by the scientific method (Sokal para 3). The paper, according to Sokal and Jean Bricmont in their follow-up book, *Fashionable Nonsense* (or *Intellectual Impostures*, in the original French), is “chock-full of absurdities and blatant non-sequiturs” and “stunning leaps of logic” which echo the “postmodern” theorists’ incomplete understandings and inaccurate inhabitations of similar scientific theories (Sokal and Bricmont 1-2). The point of the hoax was to prove that academics in the humanities would eat up any “science”-based metaphor or theory without even knowing how accurate the “science” was, or if it was an accurate representation at all; the publication of Sokal’s paper, which was an obvious joke to those with the scientific knowledge to actually understand it, proved, to an extent, the academic appetite for this “fashionable nonsense,” but also that the legitimacy of the science was not truly important to this type of paper’s audience.

Elizabeth Leane has done research on the relationship between popular science and the “humanistic disciplines,” especially in relation to “the science wars of the 1990s” (Kaiser 1485), in which Sokal’s hoax paper was a key component; according to Leane, many of the authors of the “postmodern” (according to Sokal) or perhaps “postscience” papers got their understanding of these scientific theories from popular science writers, rather than from heavily theoretical textbooks and other such sources; in particular, “[q]uantum mechanics entered into popular consciousness [...] following the huge success of *The Tao of Physics* [by Fritjof Capra] and its New Age imitators, such as Gary Zukav’s bestseller *The Dancing Wu Li Masters*” (Leane 412). These science writers were “popularizers,” bringing theories to nonspecialist audiences and allowing them to penetrate the mysterious world of physics. However, the theorists adapting these “popular” representations for metaphorical use in their own fields became a second kind of “popularizer,” propagating inaccurate understandings of scientific theories through analogy to philosophy or linguistics or whatever-else to the audiences in their respective fields, like a bad game of “telephone.” While the scientific theories used may be effective metaphors in the ways they are presented to explain other concepts, Elizabeth Leane complains along with Sokal and Jean Bricmont that by using scientific concepts that they don’t fully understand, theorists “run the risk of unconsciously abandoning the interpretative constraints imposed by the scientific community, blurring the science-based parallels and metaphorical extrapolations of their analyses to the point of meaninglessness” (Leane 418), and that often, “the metaphors popularizers employ, like the equations employed by particle physicists, are all vehicle and no tenor” (Leane 420). In other words, because they are misused and misunderstood, the scientific theories used as metaphors by these critics become empty, pure analogy, disassociated from even the general meaning of the science that is being metaphorized.

Even though Sokal and Bricmont allow for “poetic license,” not being bothered by *poets* using “words like ‘black hole’ or ‘degree of freedom’ out of context and without really understanding their scientific meaning” (10), I am using their criticism of theorists to distinguish

poetry which uses “empty” scientific language for embellishment from that which uses “weighted” scientific language that takes full advantage of the concepts behind their invoked science. “Empty” scientific language can refer to anything as simple as “women with nets hugging a galaxy of curlers” (Buckley 13), in which “galaxy” refers simply to a large number of objects without addressing or using the other qualities or full associations of a galaxy, to more convoluted expressions like “the infinite // latitude and vacancy of the dark” (Buckley 51), where latitude is used as an “infinite,” when latitude is a measurement defined in finite angular range; the extension of the angle might conceptually result in “spinning” (for example, around the earth from pole to pole), but going nowhere, which contradicts the notion being presented of the “infinite” extendable dark and thus sets science and poetry against each other to some extent. In contrast, the “science poetry” I have in mind uses scientific language and its metaphors to their fullest possible extent, takes advantage of the mutual intent of science and poetry to define and better understand the world, and assumes that the two can fruitfully work together in a way that can “provide material, images, metaphors, and procedures that might be mutually enriching, illuminating, or pleasurable” (Crawford 6). Additionally, poems which don't use scientific or technical language may still be considered “weighted” if they rely heavily on scientific aspects of their topics in ways that promote a scientific worldview or exhibit the value of the scientific method, rather than just including “fancy scientific jargon” for the purpose of “displaying ... erudition” or “to pass off as profound” (Sokal and Bricmont 11). As Peter Middleton, scholar of the recent interactions between poetry and science, writes, “[a] productive model of the object of scientific study is one that hints at possible improvements to the theory; similarly, a complex poetic metaphor also helps us begin to grasp new facets of something not yet well understood” (1271). Some works manage to make science's inherence in contemporary society more apparent to the reader by showing the “scientific method” and its results and subject matter as being processes for empirically determining information about the world. Mary Barnard's *Time and the White Tigress* (1986), for example, shows how contemporary society has inherited ancient

science; she demonstrates that the origin of various myths and customs developed through scientific processes. In the rest of this essay, I will exemplify some techniques used in science poetry, including Barnard's, Christopher Dewdney's, Christian Bök's, and my own.

Time and the White Tigress is a book-length poem that works its way chronologically through the creation and evolution of sky-based mythologies in relation to the changing positions of the stars and other visible objects in the sky, as observed by "sky-watchers." Barnard emphasizes in her notes for *Time and the White Tigress* that the "[d]escriptions of astronomical phenomena in this poem are not designed to give the reader an explanation of the actual workings of the solar system as we now understand them. With one exception I have limited myself to descriptions of phenomena visible to the naked eye" (63). However, despite the differences between how the solar system is portrayed in her book of poetry and its "actual workings," Barnard's work, delving into the origins of sky-based mythologies, demonstrates the rigorous science, geometry, and calculation behind their creation. In the prologue, before the mythologies even come into existence with "In the beginning there were two, and they were Twins" (2), Barnard sets up the "sky-watchers" as those who came before calendars and ceremonies and societal customs (1):

The watchers determine the day or night for feasting,
but not until time is measured, the beat established:
they split the year into halves and then into quarters.
They find the North and South and East and West.
They draw a cross in the sand. They watch the shadows,
the sun and moon, the rising and setting of stars,
and then they mime their knowledge (1)

The "sky-watchers" are defined by what they do — they "watch" and take data from what they see, they calculate ("split the year into halves and then into quarters"), they draw diagrams ("a cross in the sand"), and they "measure": a scientific process. By setting up the sky-watchers as

scientists *and* as the basis of society, which still uses calendars and customs left over from those ancient calculations, Barnard builds science into our worldview from the ground up. Science seems almost to supplant spiritualism or mysticism as the basis of myth and religion, especially later in the text:

But to name the day when the sun turns *ageyneward*—the solstice,
summer or winter—the calendar-priest needs a temple
or simply a gnomon enclosed for its own protection
in sacred precincts; and that will turn into a temple. (23)

Here, the religious events of “Sun-worship” rely on the “calendar-priest” (himself a scientist) to calculate exactly when the solstice celebrations are to occur; for that, a gnomon, the projecting part of a sundial, the scientific tool required to do the math, becomes one of the centres of the religion itself; “and that will turn into a temple.” Thus, even though *Time and the White Tigress* uses little scientific or technical terminology, instead relying on simple or poetic descriptions, the text still combines poetry and science by showing and emphasizing the inherent connection between scientific calculations and the myths that followed.

Similar to *Time and the White Tigress*, *Sol and the Rockettes* uses a prologue in which science supplants traditional myth. In a parody of the Lord’s Prayer, *Sol and the Rockettes* replaces the traditional Christian God figure with “gravitas,” an eternal creator/ancestor figure (1). In addition, the speaker, through prayer, is *recognizing* gravitas as an ultimate power, indicating that science may be worshipped as a new religion, or that it has replaced “religion”-like worship entirely. However, while in *Time and the White Tigress* science is built into mythology via human agents, who do science for religious purposes, in *Sol and the Rockettes*, neither the speakers of the prologue (“us”/“we”) nor gravitas as god-figure appear again in the text; gravity is normalized as such and mentioned only one other time in his mythical Grandfather form, in Terra’s section: “None of her siblings seem to remember Grandfather, his apples, his tight hugs” (20). Here, Grandfather only faintly resembles gravity, “his apples” briefly alluding to Newton

and “tight hugs” to the coming together of two bodies (which gravity, as an attractive force, could cause and does, at other points in the text). Even though gravity *exists* in other places in the text, he is not *recognized* as a god-figure/ancestor/creator. Only Terra, as a characterization of earth/humanity and its relationship to space, has a partial understanding of Grandfather gravitas as gravity and of the associations and qualities that come with that (for example, recognizing him as a “Grandfather” means recognizing him as an ancestor or as something that came before).

In addition to supplanting the Christian God with gravity, *Sol and the Rockettes* also invokes some of the Greco-Roman pantheon whose names the planets share. However, when these gods are invoked, it is often to diminish their godly presence/power. For example, on the only occasion when Mars’ deistic form is invoked, it’s through mention of Olympus: “Mars propped against Olympus” (28). Mars, sitting next to both the home of the gods and the tallest volcano in the solar system, is surrounded in the text by Seussian rhymes and playing a childish game of “she loves me... she loves me not” (“she suns me / she shades me” (28)). The context of the poem makes mythical Mars seem like a small, powerless, child, the opposite of the powerful god of war. At the end of the page, Mars “crumbles” (28), further removing his character from that of Ares. Jupiter’s godliness is also undermined in the beginning of his section, when he “crushes his failure, incinerating internally, / core combusting deific daydreams and desires” (33). Here, Jupiter is set up as a “failure of a dwarf star” with failed “deific daydreams” (33); his “failure,” being presented with imagery that is both scientific and mythological, makes equivalent and synonymous the terms “star” and “deity.”¹ While this synonymy does not affect the definition of “star” here, since there is no star that receives more power or supernatural ability from also being made a god, the pairing *does* limit the definition of “deity” to burning balls of gas due to how this “redefinition” occurs in the text: Jupiter’s scientific role/classification as planet *has* the

¹ This is a redefinition which is created through language play, overwriting the existing association of planets as Roman-Greco gods.

power to limit him, preventing him from physically becoming a star and thus a “god,” but the opposite is not true; his mythological role as “deity” does *not* have the power to turn him into a star. Thus, scientific classification is shown to be superior to mythology here, since it is the terminology and classification that limit the god’s ability to *be* a god.

Effectively, while *Sol and the Rockettes* uses a similar tactic as *Time and the White Tigress* in using a prologue to set up science or a scientific principle as an underlying, base element of the text, *Sol and the Rockettes* differs from Barnard’s work in that *Time and the White Tigress* shows that mythologies and science are one and the same, where *Sol and the Rockettes* undermines the mythology inherent in the planets’ names and makes the scientific aspects superior. By undermining mythologies (especially those usually associated with creation or the planets), *Sol and the Rockettes* establishes a partial hierarchy of images and “weights” science and factual associations as being more important than myth and unfactual associations.

Christopher Dewdney’s work, unlike Barnard’s, uses an abundance of scientific and technical terminology, in conjunction with poetic, metaphorical description. The title *The Natural History* (2002; in its older forms, titled *A Natural History of Southwestern Ontario*), gives the work the feel of a textbook, and the way Dewdney uses technical language mimics and emulates the textbook feel. For comparison, in Dewdney: “The skin, neither moist nor dry, / is a porous membrane of cells dividing...” (4); in *Tissue and Organ Regeneration in Adults* (an academic textbook): “The epidermis is supported by the dermis, a tough layer often about ten times the thickness of the epidermis” (Yannas 28); and in *Biology* (a high school textbook): “The cells continue to grow and divide. Eventually the ectoderm cells develop into the skin and nervous tissue of the animal” (Biggs 298). The similarities in language-use between Dewdney’s poetry and the sample textbooks are striking, all using technical terminology (“cells,” “porous membrane,” “epidermis,” “ectoderm,” “nervous tissue”) which serves to explain an object or process somewhat plainly (without much syntactic embellishment). The short, uncomplicated sentence structure that permeates Dewdney’s work is particularly reminiscent of encyclopedic

descriptions of animals or plants, such as those in *The Natural History of Canadian Mammals*: “Black-tailed Prairie Dogs use three principal gaits. They mostly walk, but may lope or bound when travelling faster. Tracks may be found all year round, even in snow. Runs and trails begin and end at a burrow” (Naughton 20). Dewdney combines literal² descriptions, the technical language typical of textbooks, and the simple syntax typical of both textbooks and encyclopedias, with poetic, metaphoric description that complicates a technical portrayal.

Dewdney uses both literal scientific descriptions (“A cephalopod washes up on a grey Silurian / beach. There are no land plants and little oxygen in the atmosphere” (5)) and poetic/metaphorical language (“The forest is / naked [...] Squatting patiently all night after / a rain as a large toadstool rises up into her / vagina” (7)) separately in *The Natural History*. However, he primarily combines the two modes such that the scientific/textbook language accrues a kind of poeticism or eroticism in itself through association with the other elements in the text. This can be seen in how he portrays the forest as a sexual being; her sexuality is not a neatly defined thing, but a mess of reproductive organs which are constantly changing shape. She is described as a collective of reproductive systems, indicative of the many creatures which the forest is composed of, in “Rain descends over erect cocks / and nipples” and “Cocks semi-transparent / in foliage of vein and translucent head / the cool vagina under camera tree” (8-9). The forest is also described, in the example above, as an implicitly human female (“squatting” after a rain). The variable nature of the forest’s sexuality in the text allows it to be redefined to adopt the scientific language as well, and at one point, scientific language completely takes over her sexual description in the text:

Her spine ends
in four extra vertebrae, prehensile
as a finger. Her parents obviously intrigued

² For the purposes of this essay, “literal” will refer to the level of scientific facts about the universe.

by the sexual options in the genetic
engineering catalogue. (27-8)

Despite being a metaphorical description (since the forest does not have a single “spine”), the first sentence seems almost sterile in its textbook-likeness, and its relationship to the forest’s sexual nature is only revealed through the second sentence, which classifies this “prehensile” tail as a “sexual option.” Because of the context of the rest of the text, however, this textbook-like description becomes associated with her other sexual descriptions, which are primarily much more poetic and sensual: “A delirious rush of invertebrate orgasms / in the implacable recall of the ocean” (27), “Her nipples stiffen, flakes / of come peel off like cellophane. Her / delicate white legs unfoalding [sic]” (22), etc. The context of the forest’s sexual description thus makes the above excerpt more like erotica than a textbook description and reappropriates the technical/scientific textbook language. At the same time, similar to how Barnard makes science inherent to mythology and the calendar dates of our contemporary calendar, Dewdney’s incorporation of scientific language and concepts generates a new genre of nature poetry by making scientific classifications, and information which is not available to the naked eye, necessary components of the nature being described, as opposed to more traditional nature poetry, which tends to describe only the visible surface features of a landscape.

While *Sol and the Rockettes* does, to some extent, linguistically associate scientific terminology in the same way as *The Natural History* (as seen in the “star”/“deity” duality above), *Sol and the Rockettes* also emulates Dewdney’s work by presenting multiple metaphorical representations of an object which do not completely agree with each other or form a single collapsible image. In Dewdney, this can be seen in the many competing representations of the forest and her sexuality. In *Sol and the Rockettes*, the planets and other astronomical objects are represented at different times by plainly stated fact and by simultaneous metaphor-mapping in which factual concepts about these objects (the source domain) are conceptually mapped onto different and competing target domains (for example, the solar system is mapped onto the domain

of a familial household, the planets onto human bodies, interplanetary relationships onto romantic relationships, etc.).³ On page 42, Saturn is a writer who has “written the script and cast the players” for some kind of show or “play.” Simultaneously, he is a chemist putting elements together and “watching” for a reaction. Saturn’s position as scientist ensues from the molecules (NH₃, PH₃, C₂H₆) that appear in the middle of the “play”; these “players,” by appearing as literal atoms and molecules (“H₂ as itself / He as itself” (42)), refuse to fit into the metaphorical structure of a play, where they, as actors, would be costumed and put into alternative roles (not appearing “as themselves,” but as “characters” of some sort). Since Saturn is in actuality unable to “write the script” at all since he is *not* in control of how the molecules interact once they’re put together, the “play” metaphor is shown to be false. The scientific language here, the opposite of how it acts in Dewdney’s work, breaks through the metaphor to an extent and prompts a scientific reading of the page; this kind of metaphorical break in turn prompts literal readings of other metaphors used in the text and of the characterizations of the planets themselves. On the page following the chemist/play scene, there is about an equal amount of metaphorical and scientific language, which keeps Saturn relatively grounded in his “planet” form; “to form unions of illusory love, / core meets swirling H-He matrices / core meets core” could mean, on the metaphorical level, sex without emotional involvement as the meteoric bodies touch Saturn’s, or, on the literal level, the physical destruction of the meteors as their cores crash into Saturn’s core. The previously seen metaphor-breaking, however, pushes the reader to interpret the poem in the more literal sense. Similar to how Barnard and Dewdney make the scientific aspects of their subject matter inherent and essentially important in their texts and to their readers, prompting literal readings of the poems, *Sol and the Rockettes*, as exemplified here, makes the literal level of

³ I am following George Lakoff’s “Contemporary Theory of Metaphor,” in which metaphor is a conceptual mapping of one “mental domain” on to another and in which a “domain” is a set of associated images and concepts (such as those surrounding a “journey”); concisely put, Lakoff’s “metaphor” is understanding the domain of _____ (target) in terms of the domain of _____ (source).

the scientific facts underlying all the metaphorical constructions the level that needs to be uncovered. The science integrated here can be considered “weighted,” as earlier defined, because it is fundamental to the construction of the text and the images in the text, as opposed to “empty” analogy, which would not interact with the science involved.

The simultaneous metaphor-mapping in *Sol and the Rockettes* results in conflicting characterizations of planets as both children and adults, humans, gods, rocks and more.⁴ This can be seen in several of the passages mentioned earlier, in which the mythological associations of Mars’ and Jupiter’s names are at odds with how the characterizations (drawing from science) are presented. The characterizations are not consistent, often giving both childlike representations and more adultlike representations. In some cases, the planets’ characterizations are portrayed as detached from their physical bodies. By sitting next to Olympus (28), for example, Mars is paradoxically sitting on his own surface, leading to the possibility that the rhyming poetry and the petal-picking is all happening in Mars’ mental landscape, a potential dream world, which the Seussian language also contributes to due to its association with absurd settings. Similarly, on page 42, Saturn’s personification is detached from his planetary body, as he observes his hexagonal pole (the “pit” in which he watches his players play) from an outside perspective, and Uranus “writes characters [his moons] into existence” (49), invoking an “imagined playground” that suggests that these friends of his *are* really just in his head, or on the page. In the Jupiter section, Jupiter is first a planet/failed god (33), then an acned teen (34), then a scientifically described planetary body in a metaphorical ice bath (35), then a character whose age melts from

⁴ For Lakoff, “simultaneous” mapping usually occurs in poetry, where multiple metaphors are invoked to create a single, complex image: the example he uses is, “Do not go gentle into that good night” (Dylan Thomas); “Here *go* reflects DEATH IS DEPARTURE, *gentle* reflects LIFE IS A STRUGGLE, with death as defeat. *Night* reflects A LIFETIME IS A DAY, with death as night. This one line has three different metaphors for death, each mapped onto different parts of the sentence. This is possible since mappings are fixed correspondences” (203). *Sol and the Rockettes* sets up its own metaphors, mapping onto the target domain (astronomy) multiple source domains to produce conceptual metaphors like SATURN IS A LOVER and SATURN IS A CHILD; however, most of these source domains contradict each other, which results in opposing images in the text.

child to father/adult (36), then a god/planet (37), then a lover (38), then a child/failed god (39): the constantly shifting perspective serves, in part, to unsituate the reader, since he/she is constantly being forced to focus on different planetary aspects through different metaphorical or literal frames. I hope what this shifting does is defamiliarize the reader from his/her preconceived notions of the planets and the solar system in general, which contains much more than just the main planetary bodies.⁵ As Neil deGrasse Tyson puts it in *The Pluto Files*, “[t]he grade school tradition to rote memorize planet names (usually one’s first encounter with the solar system) unwittingly conceal[s] a staggeringly rich landscape of objects and phenomena” (19). By unsituating the reader, *Sol and the Rockettes* attempts to reveal some of the numerous “phenomena” that familiarity overlooks.

Christian Bök uses a similar defamiliarizing tactic in “The Late Heavy Bombardment” in *The Xenotext*. Amidst the burning meteors and shattered Molotov cocktails and “tsunamis of lava” (12), there is an orchid which “must have bloomed among the flamethrowers in the furnace” (13). This flower, especially since it is of a variety known for being hard to care for, should be dependent on water and a fertile environment (the familiar representation/experience of a flower), but it is shown here to flourish “among the flamethrowers in the furnace.” While the fragile orchid’s existence in this hell would initially seem to present a potential destruction of an object which has been cultivated, the language says differently; the orchid’s “blooming” instead presents, perhaps, the impression that the bombardment, despite its fiery, destructive representation, contributes to life on Earth and maybe even kickstarts all life with this single

⁵ According to Viktor Shklovsky’s famous essay on defamiliarization, “Art, as Device,” “[t]he goal of art is to create the sensation of seeing, and not merely recognizing, things; the device of art is the ‘enstrangement’ of things and the complication of the form, which increases the duration and complexity of perception” (162). Derek Muller, in some of his work on science education, explains that “When something is confusing, Drew [your conscious thought] works harder, and when Drew [your conscious thought] works harder, you’re more likely to reach the right answer and remember the experience” (9:11 to 9:18). The “complexity and duration of perception” caused by the confusion of images prompts a reader to *work* towards finding some kind of “answer” or reconciliation, and the difficulty of that mental work anchors the “experience” in the reader’s mind.

flower. Since the bombardment ended around the time life started (around 3.8 billion years ago), the possibility that the bombardment contributed to the creation of life could very well be a scientific theory that Bök is presenting through these contrasting and defamiliarizing images. Another image that Bök uses to produce defamiliarizing effects is the contrast between the objective, impersonal nature that the bombardment *should* have, and how it is actually portrayed as a violent, personified attack on Earth: “When Trojans, berserk with rage, stormed over the brink of your abyss, vowing to claw your face” (12); “Only a demi-god, like 99942 Apophis, can offer you this apocalypse by becoming the juggernaut that smashes through the massive bulwark of your bedrock” (15). Here, the text is addressing the Earth (“your bedrock”), and the bombardment becomes personified, with a vendetta against Earth and the intention to harm or destroy. In addition, the bombardment has a worshipper: “a doomsayer [who] murmurs prayers [...] from a fiendish grimoire” (13). The doomsayer is murmuring “prayers,” but not spells, indicating that he is not responsible for the bombardment but rather that he is praying for it to a higher power (especially with the context of “Apophis” as “demi-god”); however, the existence of Apophis as “demi-god” implies that there is an even greater power than the barraging meteors. The collection of minor gods vengefully (and thus *purposefully*) raining fire down on Earth contrasts with the image of the “unintentioned” bombardment to indicate that there must be some cause behind this “vengeance.” In this case, Bök could be promoting the scientific theory that a change in the orbital movement of the outer gas giants (which, as planets, would be “greater” gods than meteors) caused Neptune to disrupt a ring of comets, sending them flying into the inner solar system to bombard. By using metaphors that are incongruous with his subject matter (the late heavy bombardment) Bök, in *The Xenotext*, forces readers to come to new understandings through reconciling opposite images; these new understandings often mimic scientific theories, which, like in *Sol and the Rockettes*, underlie the scenarios described in the poetry.

One thing that *Sol and the Rockettes* has in common with *Time and the White Tigress*, *The Natural History*, and *The Xenotext* is the way the texts make themselves relevant to

contemporary readers. All four works feature a compression of time, where events that happened in the past are conflated with the present. In *Time and the White Tigress*, as mentioned previously, science and myth are shown to be intertwined in calendrical events and societal customs, and the presence of ancient myths and calculations in our present lives is one of the ways in which Barnard's revelation is carried through. Barnard also, however, conflates modern readers with the scientist-priests of the past:

If you were standing at noon on midsummer's day
on that invisible line called the Tropic of Cancer,
the sun would be straight overhead; you and your gnomon
would cast no shadow at all. (26)

Converging the reader, "you," with the priests and their gnomons brings the reader to the past and the priests to the present; the science is the same, the observations the same, and this makes the processes of the myth-constructors more relevant since they can be mimicked and reconstructed. Similarly, the use of obsolete words, such as "*ageyneward*," which was included in a passage quoted earlier in this paper, brings the past and present together by situating past language in a contemporary linguistic context.

In *The Natural History*, Dewdney employs several methods to condense the past and the present. For one, he writes about both past and present events (literal and metaphorical) as if they are happening now.

The anvil
tops of cumulonimbus graze
the stratosphere, moonlight high over
the storm witnessed by a small passenger
airliner lost in the thirties. (23)

Here, the clouds which are presently passing by are being observed out of the past ("the thirties"), as if the clouds are unchanging, fixed scenery over the course of "the natural history." In addition,

Dewdney writes about events that happened *over* long periods of time as if they are happening now, almost instantaneously: “Limestone boulders rise from the depths / of the hills, eroding into fantastic shapes / as they surface” (65). The other technique Dewdney uses to condense time is the conflation of temporal categories. Dewdney frequently mixes different categories of classifying time, writing, for example, “Triassic afternoons in early October” (4), as if the organisms of the Triassic period can just come out to sunbathe in the October afternoon sunlight. Conflating temporal categories in this way leads to the condensing of time because it indicates that the entire Triassic period can fit into a single afternoon, or a single October. Conflation of past and present puts readers into the forest as a piece of the setting, watching the passage of time and perhaps being subject to it, since long periods of time are shown to pass in the blink of an eye.

In *The Xenotext* (again in “The Late Heavy Bombardment”), it is Bök’s use of imagery that condenses the time periods, as humans and other life forms incongruously come into contact with the bombardment, which happened in a period before life existed on Earth. Specifically, Bök inserts human astronauts into the time of the bombardment in the context of a battle, to defend the earth from this battery: “Even now, the astronauts have marshalled their forces to march, resolute, across the kill zone of your crematorium” (13). In addition, the two time periods are conflated by the bombardment of trees (“What shell shock must greet you when you stumble, aghast, upon the charred remains of a forest at Tunguska (its evergreens, toppled and blasted, all of them split, like matchsticks” (16)), which effectively paints a picture of the bombardment assaulting a present-day Earth, as opposed to a barren, treeless, bombardment-time Earth from four billion years ago. Finally, Bök condenses the bombardment period and the present to a greater extent by bringing remnant elements of the bombardment to the present era: “Even now, Neil Armstrong returns, like Orpheus, to the airlock, his spacesuit reeking of gunpowder and burnt steel” (16), signifying that elements of the bombardment *still* exist in the space surrounding Earth and that perhaps this

battle continues. By conflating the past and present and by presenting a view of what the bombardment might do to Earth if it happened today, Bök makes his subject relevant to readers.

In *Sol and the Rockettes*, the past is used in quite a different way. Because new information about the planets and our solar system “neighbours” is constantly being obtained by contemporary space missions, the media becomes saturated with newly obtained images of the planets in their present states (such as in "NASA Missions Provide New Insights into 'Ocean Worlds.'" (Northon)). In *Sol and the Rockettes*, a big part of constructing the planets as literary objects and their characterizations was using the planets’ pasts. Aspects of how they developed, physically, into the planets they are today are present in the text, but these aspects of their physical development are also mirrored in their characterial “emotional” development (so, how the planets developed as planets establishes how the planets have developed as “people”). For Mars, this involves his past oceans and the sun’s involvement in stripping them away. To Mars, water was life, or its possibility, and taking that away makes him “naked” (27) and vulnerable; this physical development in turn affects the development of his characterization, leaving child Mars with a bitter relationship to Mother: “she suns me / she shades me [...] she strips me / she bathes me” (28). The bittersweetness is that he is being bathed in sunlight after being “stripped” of the water that he misses. Here, like in Dewdney’s work, the past events are also presented as if happening now: “solar breeze, with every pass, pulling the hydrogen / from Martian lungs ... Mars, drying” (27); “she strips me” (28). Venus’s characterization, on the other hand, is based on science fiction of the past and the development of our knowledge and understanding. “vestal womb / amniotic sulfur stirring science fiction greens” and “pseudogoddess’ pseudocyesis” (14) refer to the time before we could see through Venus’s thick atmosphere, when science fiction authors frequently wrote Venus as a jungle planet brimming with life. In Venus’s characterization, this turns into a wish for children/life, a hope that gets dashed when Venus finds out she is sterile, despite the symptoms of pregnancy which she is showing. Like the other texts

mentioned, *Sol and the Rockettes* conflates the past lives of the planets with their present selves in order to make the past more real for readers by contextualizing it with the more familiar present.

In conclusion, while *Sol and the Rockettes* presents a complex view of the solar system, it utilizes various techniques, similar to those used by contemporary poets, in order to emphasize the importance of the literal, scientific representations of the planets and other astronomical objects. The scientific information behind and integrated in *Sol and the Rockettes* came from many different sources, including NASA, *National Geographic*, and Astronomy Cast, but the intention behind this project was to create a work that would translate some lesser-known or misconceived facts about the planets into a poetic form that would make the “translated” facts stick in the reader’s mind. By portraying these facts in poetic form and in competing metaphors, *Sol and the Rockettes* engages readers more than straight facts, as presented in an astronomy textbook, for example, because here readers have to work out the literal meanings for themselves: defamiliarization is a form of understanding. The presence of multiple conflicting images prompts the reader to come to some sort of reconciliation among them, and in this text, the only thing that every image has in common is their underlying scientific basis.

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