Supplementary Material for

Teaching Shakespeare's Theatre of the World
by

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This Universal Theatre - Script

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[Title Sequence]

"O for a Muse of fire that would ascend the brightest heaven of invention…."

"A kingdom for a stage, princes to act, and monarchs to behold the swelling scene"

"We came in peace for all mankind"

[Scene 1]

To grasp our places in the world, we must turn not only to technology, but also to imagination.

For centuries, the theatre of the world metaphor has invited one to imagine the earth as a stage upon which humanity acts - directed by Lady Fortune, and judged by a celestial audience who determines whether we shall be rewarded with a heavenly afterlife, or sent to earth's core, to be forever tormented.

Contemplating the "theatre of the world" generates perspective by which one may compare short-lived mundane rewards with the eternity of the afterlife.

Ideally, as we find in works like Cicero's "Dream of Scipio," published in the century before the common era, contemplating the cosmos inspires individual virtue, and leads to a healthy political community.

In Cicero's dream vision, Africanus advises:

"If you will only look on high and contemplate this eternal home and resting place, you will no longer attend to the gossip of the vulgar herd or put your trust in human reward for your exploits. Virtue…should lead you on to true glory"

For centuries, our world stage was grounded in a geo-centric Aristotelian cosmos comprised of eight spheres divided into two spatial domains: the sublunary cosmos - located "under" the moon - and the heavens above.

One finds earth in the sublunary realm, bound by the moon's orbit;
this was thought to be a realm of changeability, of decay, and of death.

"Above" the moon lay the fixed heavens, made of incorruptible ether. Here, early astronomers thought the planets orbited earth, and traveled on solid spherical containers that were set into motion by a "prime mover."

Although Greek astronomer Aristarchus challenged Aristotelian cosmography shortly after its inception, and the Muslim Arab astronomer Ibn al Haytham argued for a heliocentric model again around 900 Common Era, geocentrism dominated pre- and post-Christian western astronomy.

It was not until Shakespeare's time that challenges to world order were taken seriously.

[Scene 2]

In 1543, Copernicus' publication of *On the Revolutions of the Heavenly Spheres* renewed arguments for a heliocentric solar system amidst hypotheses of an infinite universe, and wonderings about whether or not there was life on other planets.

Copernicus' theory departed from Aristotelian cosmography by claiming the earth orbited the sun, revolving on its own axis, and in its contention that the eighth "sphere" was not the prime mover, but instead a stationary realm of stars.

Later, in 1572, the appearance of a "new" star in the constellation Cassiopeia encouraged Continental astronomers like Tycho Brahe in Denmark, as well as Thomas Digges, John Dee, and Thomas Harriot in England, to suggest that earlier conceptions of a static universe "above" a sublunar sphere were wrong, and so too a universe built upon a system of solid spheres.

Cassiopeia's "new" star, now recognized as a supernova, was not an isolated celestial event. Comets graced English and European skies in 1577 and 1590, contributing to changes in cosmographical architecture before the turn of the seventeenth century.

Perhaps tellingly, as astronomers "unsphered" earth and the skies above, the "theatre of the world" commonplace enjoyed a renaissance throughout Europe, and made its way from philosophy into popular print and theatre culture, as well as architecture. The Globe Theatre, built in 1599, reportedly boasted the Latin motto that Shakespeare translated in *As You Like It* as *"all the world's a stage."*

The "theatre of the world" has been called the "master metaphor" of Shakespeare's plays, and it's no coincidence that the Globe theatre architecturally figures this commonplace, the stage earth, the trap door leading to hell, as the audience - rising in seats to the sky - judge the performance below, and determine the actors' fates.

[Scene 3]

What does the theatre of the world look like now?

In the 1950's, Dutch educator Kees Boeke's *Cosmic View* inspired several films that follow ancient and early modern imaginative journeys to space, traveling outward by powers of 10.

Let’s see where science can take us today.

Starting at 10 kilometres above the earth’s surface, we’re about as high as Mt. Everest

Multiplying by 10, at 100 kilometres, we encounter the Karman line, named for Theodore von Kármán - this point conventionally defines the boundary between air and space, or the end of the atmosphere.

Here at 1000 kilometres we’re in low earth orbit, and here we see some of the satellites that enable the GPS on your phone or in your car, as well as the International Space Station, magnified greatly so we can see it here.

Moving outward to 10,000 km allows us to see the entire disk of earth.

A little further out, at around 10,500 km one also finds the Chandra Xray telescope, launched in 1999, and still gathering data about the life and death of stars- including the November 1572 supernova in Cassiopeia that, when Thomas Digges measured its parallax, confirmed that it was not a sublunar phenomenon. Digges was inspired to travel further on the “wings and ladders” of mathematics and ultimately suggested that the star was moving off into space, a theory that fellow astronomer John Dee also entertained.

Chandra’s identifications of star matter also confirm hypotheses about humanity’s elemental make up - we are made of the same stuff as the stars.

Let’s allow Chandra to get back to work and resume our journey.

At one hundred thousand kilometres, we remain in the “sublunar” world insofar as we have not yet passed the moon’s orbit.

The moon is approximately 400,000 kilometres from earth - that’s roughly 30 earths away from us. Its visibility to the naked eye has incited the human imagination since the beginning of time.

The first astronauts, looking back at earth from the moon, were awestruck by earth’s beauty, and by their experience of scale from a lunar perspective.

Continuing our journey – at one million kilometres from earth we have flown past the moon’s orbit.

In 2021, NASA launched the James Webb telescope which traveled 1, 600, 000 kilometres to gather data about the formation and expansion of the universe. It’s hard at work now.

Traveling beyond Webb to 10 million kilometres allows us to recognize the ancient ‘spheres’ as orbital paths of Earth and Inner planets. 10 Million km is approximately the distance from the earth to the sun;

Venus is about 38 million kilometres from earth,

Mars 50 million,

and Mercury approximately 77 million kilometres away.

As we reach a distance of one hundred million kilometres from earth, we find ourselves in the middle of our solar system.

Jupiter and its moons orbit about 588 million kilometres from earth

And it is not until we travel one billion kilometers that we can begin to recognize the orbital paths of the outer planets, including Saturn,

at approximately 1.2 billion kilometers from earth.

Only these seven planets were visible to astronomers in Shakespeare's day; the18^{th} and 19^{th} centuries brought later discoveries of Uranus and Neptune.

As we move onward to a distance 10 billion kilometers, one finds only comets - and Voyager. Launched in the 1970's, Voyager continues to send data back to earth.

At 100 billion kilometres from Earth we can pause to consider familiar constellations that can be easily seen in our night skies: The Big Dipper from the Northern Hemisphere and Crux, the Southern Cross, visible from the Southern Hemisphere.

These stellar patterns have been used to navigate for millenia, even in space exploration. But as we travel greater distances from Earth, conventional celestial navigation no longer works.

Our perspectives continue to change as we reach a distance of One Trillion kilometers from earth and we leave our familiar solar system behind.

We are now at a distance of 10 Trillion Kilometres from earth. Such huge numbers are often described as "astronomical".

At these great distances, units like meters and kilometers are unhelpful, so astronomers have defined a unit of distance called the light year, which is approximately equal to ten trillion kilometers.

Between 1 and 10 light years, we pass the nearest stars: the Alpha Centauri system, Bernard's Star, and Sirius, the dog star.

It is not until we reach one hundred thousand light years that we can see the full disk of the Milky Way. The diameter alone measures approximately 100,000 light years.

As we travel one million light years from earth, each bright light representing an entire galaxy, it might be hard to imagine that our planet alone sustains life.

At 2.5 million light years, we fly past Andromeda Galaxy - this is the nearest large galaxy

At 100 million light years, we have arrived at the farthest reaches of the known universe; "known" because this is as far as our current technologies capture.

That which lies beyond is undiscovered country, rather, undiscovered space, infinite, and expanding.

The time has come to return home. As we do, you might contemplate your relationship to our world, to our galaxy, and to our infinite, ever-expanding universe.

[Epilogue]

All the world's a stage,
And all the men and women merely players;
They have their exits and their entrances;
And one man in his time plays many parts,
His acts being seven ages.

At first the infant,
Mewling and puking in the nurse's arms;

And then the whining school-boy, with his satchel
And shining morning face, creeping like snail
Unwillingly to school.

And then the lover,
Sighing like furnace, with a woeful ballad
Made to his mistress' eyebrow.

Then a soldier,
Full of strange oaths, and bearded like the pard,
Jealous in honour, sudden and quick in quarrel,
Seeking the bubble reputation
Even in the cannon's mouth.

And then the justice,
In fair round belly with good capon lin'd,
With eyes severe and beard of formal cut,
Full of wise saws and modern instances;
And so he plays his part.

The sixth age shifts
Into the lean and slipper'd pantaloon,
With spectacles on nose and pouch on side;
His youthful hose, well sav'd, a world too wide
For his shrunk shank; and his big manly voice,
Turning again toward childish treble, pipes
And whistles in his sound.

Last scene of all,
That ends this strange eventful history,
Is second childishness and mere oblivion;
Sans teeth, sans eyes, sans taste, sans everything.

Credits