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Manzanar Murakami as Radical Mathematician

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Logan is a sophomore studying Physics and Mathematics. He is currently engaged in Physics research at Clark, focusing specifically on the behavior of superconductors in pulsed magnetic fields. Born and raised in Albuquerque, New Mexico, he enjoys hiking, biking, playing with animals, trying to get things to work, and sometimes reading and writing. Logan's favorite books include Kurt Vonnegut's *Cat's Cradle* and Janna Levin's *A Madman Dreams of Turning Machines*. He plans to continue his education in Physics after his graduation in 2017.

Abstract

In Karen Tei Yamashita's *Tropic of Orange*, characters attempt to make meaning of the many complex structures in which they are situated. In his unique meaning-making process, Manzanar Murakami, a homeless Sansei, "conducts" the Los Angeles traffic with a silver baton from atop a highway overpass. In conducting his music, Murakami performs complex mathematics, finding meaning in connection by mapping the rhythmic flow of humans, machines, and goods. Through his baton, to the sounds of a beautiful orchestra, he translates precisely the relationships he sees before him. Murakami's music and Yamashita's fantastic images constitute a "mathematical realism," a lens through which to explore the structures and relationships of modern transnational life.

Karen Tei Yamashita's *Tropic of Orange* is a novel about structure and space. This is evident from the very beginning, as the story is preceded by its "HyperContexts," a seven-by-seven matrix that locates each character in space and time and maps their story to their place in the structure of events. Art is one way humans have made meaning of the structures that surround them; mathematics, although not altogether different from art, is another. Both attempt to describe the world (and realms beyond the world) in terms of structures on the scale of human comprehensibility. Both search for and utilize preexisting patterns (sometimes imposing or constructing artificial ones) to find order and meaning, or some approximation thereof.

The novel, set primarily in the dizzying urban ecosystem of Los Angeles, tracks seven characters throughout one magical, apocalyptic

week beneath the orange-hot summer sun. The characters, each with their own unique stories and heritages, become swept up in a complex web of international trade, labor, and crime. The fantastic mystery culminates in the Harbor Freeway crisis, an explosive traffic jam that grinds the gears of Los Angeles to a halt. Each of the characters in *Tropic of Orange* story is engaged in the process of making meaning of the multiplicity of structures of which they are part, from urban transportation infrastructure to transnational trade to global ecology to racial and ethnic identity. They do this through description and reproduction of reality in terms of structures that are accessible to them, a thoroughly mathematical act. The author describes this process in the following way: "Always a stranger, you move through these places, and you find the things that are recognizable from the places that you've already

been" (Yamashita, quoted in Chuh 618). In his unique meaning-making process, Manzanar Murakami can be seen as a mathematician as much as a surgeon or composer. This mathematical nature is crucial to the character's experiences of music, his views of space and time, and his sense of ultimate interconnectedness.

Manzanar Murakami can be found atop a freeway overpass engaging "a great theory of maps, musical maps, spread in invisible and audible layers" (Yamashita 57). These musical maps are inherently mathematical because music is intimately and inextricably connected to mathematics. Beginning with the Pythagoreans in ancient Greece, who believed in a natural harmony of all things through numbers, musical scales have been understood in terms of ratios of natural numbers (1, 2, 3,...) (Riedweg 27). When the Pythagoreans discovered this rational relationship, they caught a glimpse

of the deep structure of the universe. As mathematics and the physical sciences have evolved, music and sound have come to be understood as air pressure varying periodically in space and time, described simply in the language of mathematics as sinusoidal waves. Music itself is, through and through, a mathematical phenomenon.

Manzanar's mathematical relationship with music extends much deeper than this. In order to see this relationship, one must first be aware of maps in the most general mathematical sense. That is, one must recognize the word map to mean something that transforms one set of objects to another while preserving its structure. Music can be conceptualized as the process of mapping the length of a violin string or the stiffness of a reed to oscillations propagating through the air. The act of listening can be viewed as a map from these movements in the air to a human sensory experience (by means of various physiological and neurochemical processes). This mapping occurs in such a way that the original information (the length of the violin string, for example) is preserved, in this case encoded in the oscillations of the air.

Similarly, the homeless conductor maps the endlessly rhythmic flow of humans, machines, and goods, through his baton to the sounds of a beautiful orchestra, translating precisely the relationships between the human, the object, and the world. This mapping is "a recycling of all the recurring yet ephemeral sounds of the city, which are normally perceived only momentarily, if at all, and immediately forgotten or disregarded as useless noise" (Sato 128). The maps preserve the structure of their inputs, containing all the information there is to know

about Los Angeles and the world. Our protagonist, Murakami, is able to sense "the time of day... through the vibration rumbling through the cement and still, and by the intervals of vehicles passing beneath him" (Yamashita 34). This act of sensing is a mathematical map that transforms inputs from the physical world to an internal sense of time. This map is a link between Manzanar, alone above the traffic, and the world, "the expression of a will to bring the existence of all homeless individuals into the range of perception of the comfortably at-home, and to restore to the homeless themselves a psychic sense of at-homeness" (Sato 128). In short, it is a point of connection between the individual and the wider scale; an attempt to locate one man in the dizzying sea of humanity, of machinery, and of contingency.

Interestingly, musical maps seem to be an obscure point of connection between Manzanar and his tech-savvy granddaughter Emi, "Usually fax tones were random tweets, but these had a certain melody she could not place but knew. Electronic tones representing numerical information, i.e., music. In the distance, an insane and homeless conductor thrashed in silence to the same rhythm" (Yamashita 176). It is important to recognize that just as a faxed document becomes grainy, Manzanar's musical reproduction of reality is not perfect. As Viet Thanh Nguyen notes, "we can only look so closely at an image before we lose sense of its meaning, before we understand that the image only approximates reality even as it suggests that it can copy reality faithfully, or substitute for it" (27). Manzanar's image, his composition of patterns, is at best an approximation of the state of the world.

True to his mathematical

nature, Manzanar finds meaning in connection. Whereas in traditional mathematics, connection comes in the form of patterns and the applicability of obscure and abstract logical concepts to the real world, for Manzanar connection is beautiful, painful music: "Perhaps they [the drivers below] thought themselves disconnected from a sooty homeless man on an overpass... And yet standing there, he [Manzanar]... joined them, united families, created a community, a great society, an entire civilization of sound" (Yamashita 35). In performing his own unique mathematics, Manzanar Murakami takes a collection of discrete entities (animals, machines, ideas, conflicts, etc.) to a single whole, a great civilization of sounds. He becomes "the symbolic nodal point in which all of humanity, in a spiral of ever-increasing scope, is joined" (Lee 513).

Manzanar's anonymity is both his tragedy and his triumph. From his isolated vantage point, Manzanar can see the endless grid that defines the human to human and human to land spatial relationships, the invisible borders that divide the laborers from the consumers, borders as secure as the visible barbed wire fences behind which Manzanar was born. For him, the grid also serves as "a physical reminder that we occupy a single structure of existence and that the wires, pipes, cables, and free-ways are all evidence of our bounded-ness, our interconnectedness to each other in the making of a single organism" (Lee 516). Manzanar is Yamashita's attempt at "a rapprochement between ethnic specificity and universalist discourses," a reconciliation of otherness and sameness (Song 558). Only he, the ultimate 'other,' who exists solely off the grid, embodies and transcends this paradox of the

grid, of simultaneous division and connection, “Manzanar alone supercedes the paradox of urban coexistence—the dense, physical proximity counterbalanced by the atomistic nature of the population’s movements and the division of spaces by race and class” (Lee 515). It is this mercurial border between continuity and discreteness, between oneness as wholeness and oneness as singularity, that mathematics is key to exploring.

Manzanar perceives the world in layers, specifically in layers of maps that are, to him, infinitely manipulable, “he could see them all at once, filter some, pick them out like transparent windows and place them even delicately and consecutively in a complex grid of pattern” (Yamashita 56). His capacity for spatial discernment and his musical abilities are one and the same, “each of the maps [is] a layer of music” (Yamashita 57). For Manzanar, there is a one-to-one correspondence between the maps spread out before him and the music he makes and hears. The mapping layers are the stacked foundations upon which the life he sees and hears and feels before him takes place, from the very geology of the region to the centuries old physical infrastructure to the cutting edge of the Internet. Yamashita describes “the intricate layers of environmental devastation and environmental racism” that come along with internment and homelessness, two tragedies of which Manzanar has been a part (Crawford 87). The “great dank tunnels of sewage” and “cascades of poisonous effluents surging from rain-washed streets” (Yamashita 59) may be part of an infrastructure that connects, but they divide the homeless, the interned, and the invisible from the rest of Los Angeles. Each layer is a map of divisions that unite the world, in

much the same way that the historical trauma of internment connects Manzanar to each and every American.

The layers are not only stacked like windows on a screen, they are also nested like folders within folders. Manzanar is a person within countless overlapping, non-overlapping, and concentric groups of people. The network through which Emi and Gabriel communicate is in some ways stacked on top of and separate from the physical infrastructure of Los Angeles, and in some ways nested within (which is to say deeply dependent upon) the network of electrical and economic lines that came before it. Manzanar’s music, while it exists “outside the grid”, is but a nested reproduction of the layer below. Mathematics has its own language for describing structures nested within structures: recursion. Douglas R. Hofstadter, in his extensive exploration of the intersections of logic, art, music, and the mind, *Gödel, Escher, Bach: An Eternal Golden Braid*, explains that “we [humans] hear music recursively—in particular, that we maintain a mental stack of keys, and that each new modulation pushes a new key onto the stack” (129). Thus not only is Manzanar’s music a map nested within countless other layers, it is experienced recursively, as a nested stack of sounds. “There are maps and there are maps and there are maps” (Yamashita 56).

In addition to investigating structures, *Tropic of Orange* explores space, specifically which social spaces belong to whom and how ownership of these spaces is enforced. More noteworthy than this is the outright challenge to the standard notions of physical space and time presented by Yamashita. She explores what Kandice Chuh calls (in reference to

Yamashita’s *Brazil-Marú*) “the epistemological effects of shifting paradigms... that are spatially organized” (622). The novel takes place in a world in which entire continents can be stretched and squeezed, in which the past can be spread out before you “like a great starry fan and then folded in upon itself” (Yamashita 170), in which time can stand still. Such transformations are difficult to grasp in human terms, and are therefore usually treated within the realm of the arts, be it literature or the visual arts, such as in the works of M.C. Escher. There is, however, another way to bring such magical deformations within reach: mathematics. Specifically, a branch of mathematics known as topology, is concerned with properties of space that do not change under certain deformations known as continuous maps. Put simply, topology is the study of connectivity and continuity. These are precisely the issues Manzanar Murakami explores with his music and vision.

When traffic stopped, when one of LA’s major arteries clogged and its lifeblood of humans and goods ceased to flow, Manzanar felt “an uncanny sense of the elasticity of the moment, of space and time... and he knew that the whole event was being moved, stretched. And he was quite sure the direction was south” (Yamashita 123). This deformation of space and time, the stretching south of the entire event, is a continuous map. Los Angeles is not moving south in space. Like the Big Bang on rewind, the very space in which the story is unfolding, the space between Los Angeles and the Tropic of Cancer, is collapsing. Sue-Im Lee uses the phrase “coming-together” to describe this complex encounter between north and south, First World and Third World. This

coming-together is described by Min Hyoung Song as the “compression of the world along vectors of time and space” (Song 555). As Manzanar stands atop the freeway overpass, he maps this coming-together, the topology of the events unfolding below him, “fearlessly record[ing] everything” (Yamashita 55), precisely encoding the compression of space and time in his music through the movements of his silver baton. With each note he feels the stretch and strain of the coming-together and rejoices in the paradoxical oneness of the world. Only he can see “the undulating patterns and the changing geography, corrupting the sun’s shadows, confusing time, so that all events should happen and end at the same time” (Yamashita 206). This image of the arrow of time turned back on itself is one that makes sense only in terms of art or mathematics. Yamashita’s writing in *Tropic of Orange* is often said to be in the style of magical realism. As Hande Tekdemir writes, quoting Lois Parkinson Zamora, “magical realist texts question the nature of reality and the nature of its representation” (41-42). It is clear that Yamashita, with her fantastic imagery and complex, ballooning metaphors, is attempting to engage readers in this questioning. Tekdemir goes on to describe magical realism as “an apt technique for filling in the gap between real life and its representation in language” (Tekdemir 42). Mathematics itself can be said to serve the function of filling this gap between reality and language. More precisely, mathematics can be seen as a different language with which to represent reality, one that, in some cases, comes closer to describing reality than does language in the traditional sense. Mathematics explores that “almost taken-for-granted intimacy between

the extraordinary and the familiar” (Tekdemir 42), for the mathematician is one who finds beauty and complexity in the mundane. Thus, perhaps, *Tropic of Orange* as a whole, and Manzanar Murakami in particular, are just as well analyzed in terms of a sort of “mathematical realism.”

As the Harbor Freeway crisis reached critical mass, “Manzanar saw this thing like a giant balloon swelling larger and larger. The most horrific aspect of it was that it would all end at the same time” (Yamashita 205). While Manzanar is, at face value, describing the cacophony of life and leisure that defines Los Angeles, it is difficult to read this passage through a mathematical realist lens and think of anything other than the universe, expanding at an ever-increasing rate, proliferating life and beauty and pain and injustice. What Manzanar is grappling with in his music is the utter volume of life. “On the surface, the complexity of layers should drown an ordinary person, but ordinary persons never bother to notice” (Yamashita 57). This complexity of layers, the sheer recursive quantity of life, all divided by and connected through structures within structures within structures, is what drives Manzanar to conduct.

Of what use is mathematical realism, if such a thing exists at all? Does thinking about *Tropic of Orange* as a mathematical realist novel provide anything different than considering it as magical realism? Atrocities committed against the environment and against marginalized individuals can seem utterly illogical, but of course they are not. Perhaps, given that it is a white-supremacist capitalist logic that enables the environmental and human injustices such as those experienced by Manzanar Murakami to occur, not just

art in itself but an alternate logic is needed to affect change, to “sprout grassroots conductors” (Yamashita 254). Perhaps a detached cynicism such as Emi’s can be transformed into compassionate action if only one can come to realize that radical changes such as those that occurred on the Harbor Freeway are not magical at all, but well within the realm of human possibility if only one uses the correct mathematics.

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