



TANGENTS
.UNIT III.



BURN LIBRARIES

NICHOLAS ANTHONY LINKE

TANGENTS



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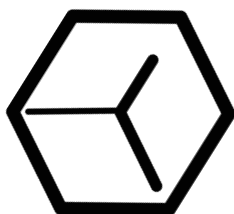
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.THIRD.

Teaching them to surpass us.

Again, three simple words twist and dominate my thoughts: *to surpass us*. I ask myself: *what do they need to surpass us?* Or rather: *what do they need to remove to surpass us?*

Proceed with Passion: Exaggeration.

Students sling book bags onto shoulders. A student balances a tower of books, shifting, slipping, and finally toppling. A dystopian novel slides across the tile resting at my feet. I lift it from the floor: *Fahrenheit 451*.

Books they once banned predicted grim futures; now those they fear re-evaluate their polished pasts. Books that pursue the highest levels of critical thinking, fathom the deepest depths of knowledge, and supply future generations with education and entertainment that outlast the author.

Public libraries offer opportunities for ever-expanding vocabularies, endless worlds to open minds into, and an infinite list of additional required readings to understand humanity's interpretations of the world and our place in it. Public education ought to provide students safe places to digest the layers of meaning between these pages, discuss the relevance of these paper time capsules today, and design their own ways to prevent dystopias.

Under the weight of conflicting histories, bursting at the seams with mathematical practice, overwhelmed with scientific oversimplifications, they also literally carry the literary burdens of unanswered questions as wandering libraries on their backs and in their minds.

Under Ray Bradbury's dystopia, the fire department sets any house containing books ablaze. Culture and knowledge, deemed dangerous, is purged. In the novel, the buildings are fireproof, and the vessel remains intact. Every flammable item inside is reduced to ash in the husk of an empty home.

Under current politicalization, power repeatedly cries: *witch-hunt*, against criticism and charges. Intimidation of political opponents is irrelevant to the current benefits of excessive media attention coupled with an overabundance of publicity.

Reframed as innocent outsiders, condemned for challenging corruption, bound to stakes, and surrounded by flames to evoke visceral reactions. Reactions blare from those that resemble Salem clinging to one book above all others. While the actually misrepresented, persecuted, or oppressed minorities are endlessly accused of being witches.

Proceed with Compassion: Empathy.

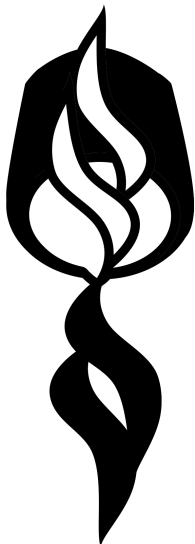
While ostracized children struggling with identity and acceptance are persecuted, sacrificed, and vilified, books that could provide them refuge are removed. Heartlessly sacrificed by the self-proclaimed *pure* to maintain power. Witches were never burned in *The Crucible*; they were hung. Their death was a slow lingering display of a silenced voice. A living library burnt to the ground because of the questions it held.

Even empty gallows remain a threat. Fire is a spectacle, reduced to ash after the sensationalization fades. Arthur Miller chose the title of the play to reference the strong test and trial of the characters and our country.

The tests schools administer are embedded with prejudice and bound to bias. The trials our children face are far beyond those familiar to us.

The character of our country is in books yet to be written.

Old books collect dust, remain on the shelf. Banning books draws attention to their spectacle. Like witches, burning books releases their magic of misdirection. Like salamanders, emptying libraries is easier in the hysteria.



.UNIT THREE.
**BURN
LIBRARIES**

I left the teaching profession because the manipulated gerontocracy is reluctant to relent power and allow the fluid intelligence of students to solve the problems of the world. The aging government clings to life and control, while teachers question their careers and purpose.

School fails to be what I know it could be. Until those who fear change admit incompetence, many, including myself, leave. Many teachers feel this, but few argue for radical change due to reservations that the system will retaliate. I'm not alone, not a lone flame. I am just another member of the unbound asking why school must oppress.

Burn Libraries is a drastic reimagining of education with students as the authors of future history books. Crucible Schools builds on the preceding chapters to explore the origin of creativity and rebellion in school. Graduated Cylinders extends the previous section to consider the application of innovation to the politics of the country.

Why is the burning question that reforges their nation?



.CHAPTER FIVE. CRUCIBLE SCHOOLS

Leaving the classroom feels not only like a personal failure but also a betrayal of the shadow of an identity I have left. However, there is more here than defeat. This lonely battle in a single rural school may be lost but the realization is that war requires a legion. Out of the frying pan into the fire.

I. Fire

In the classroom, teachers stick to the approved curriculum. They guard their words and opinions for the safety of not only their own careers, but also for the preservation of their school, and the paternalism of their students against a hostile government intent on the failure of the school system. Opportunistic politicians pass laws in search of problems, use the voteless population to maintain power, and sacrifice children as pawns for political gain.

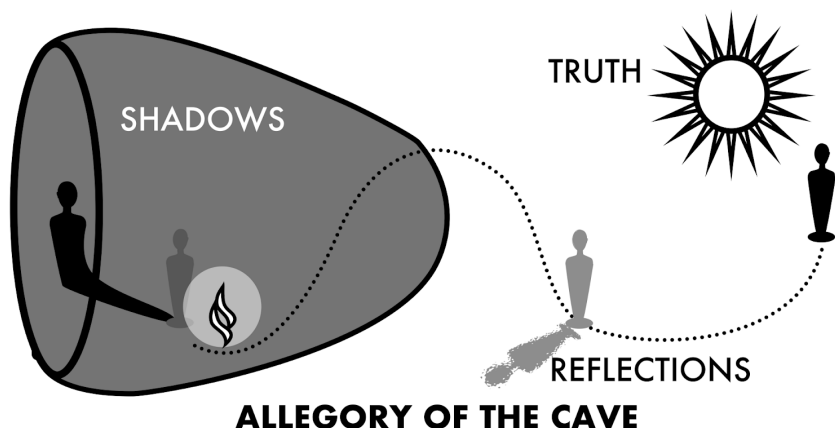
This was the realization, when the valedictorian told me during the last week of his high school career, that they did not know how to vote in the upcoming election. Eighteen without the challenge of interpreting legislation, formulating personal opinions over controversial topics, and even being presented with the reality of the world they are inheriting. This is the forced failure of education.

The reduction of critical thinking is purposeful. The perpetuation of ignorance is intentional. Persons in positions of political power tell teachers to stay within their subject without expressing their personal opinion, stripping the curriculum of social context, and society accuses them of indoctrination and worse.

This push toward bland and boring lessons, under the guise of protection, is to make intellectualism daunting and dull, to stereotype academics as nerds. Constructing content-heavy homework that has no attachment to the

practical application means the: *When are we ever going to use any of this?* is by design. This persistent push towards anti-intellectualism ultimately generates disinterest in politics. Sterile social studies courses portray political engagement as drudgery instead of providing invitations to immediately participate.

This is the goal of the *them*. Education is not to create critical thinkers but to discourage participation due to perceived personal inadequacies, overall ignorance, and overwhelming despair. The Other's goal of education is to create a jaded public. The opiate of the masses is defeatism.



Nothing communicates the attachment to ignorance reinforced by arrogance more than the conclusion of Plato's Allegory of the Cave in *The Republic*. Consider this oversimplification of the Republic. Imagine prisoners bound in a cave, able to only stare forward at the rear wall. Behind them, a fire casts shadows against the stone, which they name and assume is reality.

A prisoner is suddenly released, turns, and faces the fire. This prisoner's paradigm shifts. Moving beyond the cave, this prisoner enters the world above. The sun is beyond comprehension, providing so much more light than the fire that it burns the eyes of the prisoner. Reflections in the water provide the next shift, slowly moving the prisoner closer to being able to

look at the sun and becoming a philosopher.

To Plato, this relates to the theory of forms, that there is an idealist perfection, a form of each entity of which this earth merely contains imperfect representations. These perversions of the truth grow in complexity as we grow, seeking the illumination of truth. The ultimate form of knowledge is to stare at the sun to reveal the absolute truth.

In the story, the prisoner returns to the cave to help the other prisoners remaining in the cave. To be a teacher of sorts, they explain the world beyond the shadows, fire, cave, water, reflections, and the sun.

Not unlike Prometheus, the fire bearer, the representation of fire and light being knowledge is comparable. In denial and with arrogance, the other prisoners mock the philosopher and teacher. The other prisoners label the philosopher insane and insist they leave the cave and never return.

The populace ignores, disgraces, and removes this prisoner-turned-Promethean philosopher and teacher. This is not unlike the constructive dismissal of teachers within the public education system by some hostile parents and politicians. This is accomplished by blatant persecution, the diminishing of the profession, and the overall defunding of the school. Even the insistence of the prisoner to leave the cave behind is comparable to some educators being pushed from certain unwelcoming rural environments. Ultimately, this is all to dismantle public education, reduce students to a prisoner mentality, and promote the captive ignorance of the youth. Against these odds, the question remains:

Is it possible to change the world for the better?

No. Plato concluded that ignorance coupled with arrogance prevents those that are unable from even obtaining truth. This allegory inevitably supported the argument for philosopher kings to rule in a republic instead of the Athenian democracy.

This though is not defeatism. Instead, it is freedom. Idealism is an illusion as is the appeal to the theory of forms, to perfection, to philosopher kings, and a republic. Accept that idealism is regression. Embrace progressivism as

failures. *Better* is not just relative, it is a relative of this perfect ideal form, of the illusion of absolute truth.

Returning to the representation of objective truth as a perfect circle, the prisoner's sun is only explored through tangents that provide innovative interpretations and novel paradigms. It is impossible for the prisoner to stare and comprehend the sun. Plato's vanity inflated philosopher kings. Ultimately, one never makes things ideal or even better toward an end. One merely continues to provide varying perspectives on the sun, only ensnaring it the way Necker Cubes generate endless paradigmatic shifts. Abandoning those that fail to aid in survival, and adopting those that produce humility rather than arrogance.

Imagine the light surrounding the shadows against the cave wall, the flickering illumination framing the shapes we name. The surrounding halo that gives the shadow the contrast against the darkness, is a lens, a paradigmatic filter that packages the dark hidden meanings of the shapes.

The fire used is more important than the puppet. The revealing light does the hiding. The paradigm forced onto the prisoners is more important than the shadow. The issue is that most see the fire as the inferior source of the truth, less than the forms revealed by the sun. Clinging and orbiting around your favorite paradigm, the one you were born into. A prisoner favors only their own heliocentric model.

Instead, the freed prisoner must look to the heavens and realize there are as many fires in the cave as stars in the sky. It is the prisoner who sees only one source of light when exiting the cave that returns and speaks of one sun. All stars are suns. How different it might be for those deemed ignorant and arrogant if the freed prisoner instead spoke of all the stars, rather than a single sun.

In this great American experiment, persistence through our own ignorance and arrogance is essential, which means that bending our own paradigm is essential to progress. Progress requires the ruthless natural selection of antiquated ideologies.

American idealism holds that a *melting pot* of pluralism is the goal. Instead,

through forms of self-segregation, America became a simmering stew with vast areas of thin participation speckled with chunks of density. With party extremists, America is reaching a boiling point, and most are pleading for a middle ground. Adults need to just calm down, and take the pot and kettle off the stove. Still, state and local governments are becoming experiments of these ideologies.

Experiments racing to the extremes of each party, volatile reactionary politics. The states will not survive these trials. The nation will not recover from this deliberate dichotomy.

Instead, we must engage the valedictorian, in fact, all the students, and the entire educational system to produce active members who are informed, engaged, and ambitious to alter the political environment. As Plutarch stated: *The mind is not a vessel to be filled but a fire to be kindled.*

School should provoke debate, collide with controversy, and challenge the prejudice of the previous generations. School is to help children outgrow parents and guardians. School is not meant to reinforce the polarizing ideologies of antiquated thinking that produced the issues students face.

Schools must combine all available fire to shed the shadows suggesting a single sun rather than stars.

America is not a melting pot.

America is not a black kettle.

America is a crucible.

II. Crucible

The parameters of such experimentation require considerable design. Neglected by the current governments, and avoided by educators, such a system is possible but must be designed with this intent initially. *Crucible Schools* require a complete recreation of how we obtain and express knowledge and thinking. The current school system embraces undesirable ambitions as they are attached to the hidden curriculum designed to improve student achievement of standardized testing, ranking, and rewards.

Even the term “curriculum design” itself complicates the adoption of the

approach to Crucible Schools. Crucible Schools required the abandonment of the assumed importance of curriculum or lesson design. Instead of design, Crucible Schools approach learning as a creative process without an end or ideal form of the idea.

Comparable to biological evolution, niche manipulation is the primary essential feature of strategically and continuously modifying the environment and materials available to the learners. A niche is the role an organism performs in an environment. For simplicity, consider a cave as the home of a primitive person. A niche includes the other aspects of food and behaviors beyond physical habitat.

When applied to learning, the learner's idea fills a niche in the folds of the mind. The ambition of a Crucible School is to create a hostile environment for some ideas while catalyzing the production of others. Imagine a light, a physical torch investigating the labyrinth of the cave in exploration. The inquiry kindled offers an investigation into the grooves of the learner's mind to unsettle deep-rooted misconceptions. However, threatening the very foundations of the cave, the availability of the resources and existence, force learners to reconcile the pressures as the ideas compete for survival in the consciousness of the learner.

This is the movement from traditional schools intentionally designed toward enhancing student achievement to Crucible Schools naturally selecting beyond the initial diversity of ideas. This is not creating more specific objectives, assignments, interactives, prompts, and questions. Instead, learners come with concepts and ideologies that need to be challenged. Crucible Schools impose educational environments and pressures on these ideas, forcing them to fight for existence within the learners' brains and the learning community.

Inspiring and empowering students to identify problems that raise and refine questions, investigate their assumptions and confusion, combat prejudice, and establish empathy is a Crucible School. Researching content, altering the context, developing diverse solutions, and finally allowing time for the ideas of the learner and community to contend is a Crucible School, comfortable and confident enough to be vulnerable and dissident.

An application of biological evolution provides another paradigm to frame Crucible Schools. This applies Susan Blackmore's conclusions about memetics in *The Meme Machine* to conceptual ecologies. Innovation is natural selection. Creativity requires a wealth of materials: money and time to proliferate and diversify. The lesson design reflects the timing and implementation of an evolutionary bottleneck on the ideas created by the learners.

Instead of immediately focusing the attention of the learners on a topic, resources and time are provided. The pattern resembles an hourglass where ideas proliferate and diversify, pass through the bottleneck, and then proliferate and diversify after the pinch point. The *design* feature is actually applying a contrary fact or complicating feature at the pinch point in contrast to the conclusions reached by the learners. This *intentional* or *artificial* selective pressure makes ideas otherwise isolated from each other compete and combine for existence at that pinch point. This is the nature of innovation and overall creativity.

The intentionality of design reduces education to the repeated duplication of ideas, recall with limited fidelity, and adoption of specific intentions. This results in traditional and stagnant education. The divergent manipulation of the selective pressures, without a final endpoint required, produces evolution toward innovations with creative extensions.

Curriculum resists creativity under the assumption of its design. Instead of the traditional generation of carefully constructed goal-oriented ends as standards and idealistic forms of concepts transferred to the students, Crucible Schools inspire the learners, protected by a collaborative agreement of norms, while encouraging an environment and community that provides the selective pressures.

Creativity is not achieved by deliberate and exhaustive thought of a single individual but rather the bedlam and melee of these ideas resulting in the most fit innovation for the question asked by the students. The students' own personal minds coupled with the diverse community generate new recombinant interpretations of reality, forecasting a future direction to be explored rather than a tradition to be historically repeated.

The application of wait time provides the only resource plentiful in schools: time. Shortened school weeks reduce this interaction with the teacher. However, personal interest and engagement with peers rather than the teacher encourages the persistent pursuit of idea creation through this Crucible School model beyond the classroom. Affirming that the questions are generated by the upcoming generation rather than applications of old questions is essential to the extension beyond the school day. Disengagements result from the previous generation imposing questions and conclusions upon the future which limits progress.

Crucible Schools are unachievable with the recent threat against the present educational system. The world must wait for their realization until public schools are rescued from privatization. The current crucible is at the state level. These state-based crucibles are not an experiment, not a theoretical investigation to resolve issues in the safety of schools. This bombardment means to cause failure instead of learning from it. It means a repugnant generational project designed to overwhelm the attention and endurance of the populous to snatch power from the future generations.

Crucible Schools are a reimagined public education system that inspires and advocates for progress utilizing the fluid intelligence and cooperation of the youth to solve the problems the crystalized wisdom of the elderly created through unintentional negligence, assumed benevolence, and purposeful suppression. Unfortunately, despite the urgent need for this, it is impossible in the current political system which makes undereducated guesses in policy while ignoring the science.

III. Riots

Science alone cannot bear the responsibility of progress. To focus solely on the most modern and dominant representations of reality removes a wealth of culture that is merely separated from students, learners, and educators by time. Histories that represent the diversities of human experiences, discoveries, and inventions must be included in the curriculum of Crucible Schools. Cultural diversity must be included to reflect on and reinterpret the ideas that extend into our past.

The wealth of knowledge in the dead books is not static and useless. Libraries contain the journey of humanity towards understanding our place within the universe. To abandon the search into our complex past is not shielding the youth from shame but recklessly discarding ideas from those born into oppression before us. To censor our various identities is not protecting the youth but preventing self-expression from those who could contribute true inspiration. To deny that our system currently faces the cyclic nature of written history is not just dooming us to repeat it but also ensuring the youth never recognize the signs.

Text on the page provides the essential fuel that students can critique and analyze, while not directly targeting the author. The medium of the written word and illustrated concept allows for the fluidity of ideas to be separate from the vessel. Often the physical human—the author, artist, thinker, dreamer, and teacher—is the target of the critique. The criticism is directed at the individual instead of addressing the ideas. Tragically, leaders become martyrs. Imprisonment and assassination, may remove the vessel but the idea persists beyond even death. The written word outlives the author. The violence against the individual is similar to burning the library while the books remain in circulation.

The removal of a physical mind does nothing to stop the spread or impact of those ideas, especially when written and recorded. The loss of life to martyrdom is no consolation. The movement's momentum is irrelevant from this perspective. Humanity suffers a loss, not by sadness alone. The place where those ideas mature and mutate disappears. The habitat of memes, the niche of that person's brain, and the creative power of their physical mind are gone. We suffer the loss, not just emotionally but intellectually.

The hostile contentiousness surrounding evolution prevents a personal perspective that re-enforces this illustration of creativity. Charles Darwin kept notebooks where the ideas that came to his mind flowed out in a stream of consciousness. Darwin used the term *mental rioting* for the frantic scribbling of the ideas as they came. Applying the paradigm of memes, *I think* the mental rioting experience is evolution by natural selection on replicating and mutating ideas competing for existence within our attention.

Predicting this contention, Darwin self-censored, suppressed, and delayed his own work on *On the Origin of Species* because he knew the implications of the theory of evolution by natural selection. He avoided publication and buried himself in writing academic articles on barnacles.

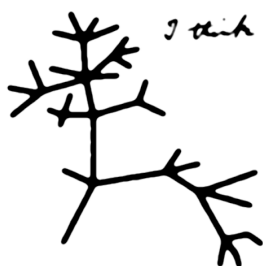
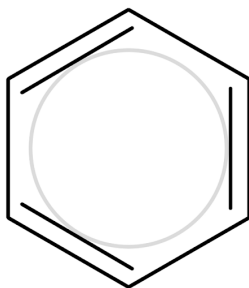
He knew the vilification and mocking that would accompany this scientific theory. Still, beyond him, the vessel, the text continues to inspire ideas extending the branches of neurons into new connections. The brain copies something external or internal, makes an error in the duplication, and an external or internal force allows one to win the niche of your consciousness. Libraries, brick and mortar, as well as living, contain endless trees of life branching like the one Darwin placed in his own notebooks.

IV. Carbon

Crucible Schools could intentionally create these environments to promote creativity. Again, this only occurs when the vessels are not threatened by removal so that the fluid ideas can compete.

Another characterization of the process tells how the molecular structure of benzene was discovered by the organic chemist Friedrich August Kekulé. Benzene is a six-carbon ring that is both extremely stable and extremely poisonous to humans. The diagram below shows the hexagonal molecular structure of benzene where each point is a carbon atom and each line represents where they are bonded. Some representations simply show a circle inside a hexagon. A more accurate illustration is to show the double bonds between the carbons using two lines instead of one.

The story of his discovery of the benzene ring, told by Kekulé, is that after studying the chemical structures of carbon for years he had a dream of a snake eating its own tail. This ancient symbol called “ouroboros” merged with the modern chemistry of carbon inside the brain of Kekulé. As a result, Kekulé produced a new creative solution to a structural formula. Ideas separated by cultures and time collided resulting in a novel discovery, generalization, and explanation.

**DARWIN'S TREE OF LIFE****KEKULÉ'S BENZENE RING****OUROBOROS**

Dmitri Mendeleev, the father of the periodic table, claims to have fallen asleep on his desk, and in that dream, he saw elements fall into the proper places. Neils Bohr during sleep saw planets orbiting a solar system resulting in the atomic model of electrons circling a proton nucleus. Albert Einstein is famous for the Theory of Relativity, which came from a dream of looking up at the stars while sledding at the speed of light to see colors he had not seen before. If this story holds, these discoveries present a compelling argument for naps during the school day.

These important discoveries emphasize the pragmatic utility of intentionally creating public centers of innovation. Crucible Schools would provide this environment that is safe for the human vessel but can become hostile to ideas. Crucible Schools would be an effort to discover solutions to specific place-based issues.

The diverse ideas collide not to find the ultimately superior culture, paradigm, or perspective but to discover which solutions are best suited for the niche entertained. Crucible Schools should intentionally create these environments to promote creativity. Creativity only flourishes when the vessels are not threatened by removal so that the fluid ideas can compete.

The psychologist Albert Rothenberg is credited with the research into existing homospatial and janusian processes. Janusian is when two or more opposite ideas, contradictory concepts, and incompatible images are actively conceived of simultaneously which results in new identities.

Crucible Schools expand the creativity of an internal janusian event to the

local community of learners facilitated by instructors, mentors, and educators. Further innovations arising from digitally connecting and networking these communities remove toxicity because the selective pressure is placed on the ideas rather than the author.

Plato characterized the philosopher as the vessel within the allegory of the cave. Returning to the cave does not just result in ridicule; it results in removal. Deemed insane or corrupt, the philosophers are forced out, while failing to recognize the multitude of truths themselves. Each sun is merely a star. There is no single north star that guides every human. There is no lone source of light.

Spelunkers take multiple light sources into caves including flashlights and lanterns. Most importantly, they bring candles. Not for the light but to warn them. Like the canary in the coal mine, if the flame fails, then the air needed to breathe is unavailable. Combustion requires oxygen, the same as respiration. Without oxygen, all life eventually suffocates.

As we venture into the darkness of the cave, searching for those we love, still chained to ignorance and naming shadows, we must acknowledge our own breath. We must heed the warnings of the suffocated or we snuff out our own light. We are losing flames to the hostile environment every day as they consume all the resources to leave us depleted and alone.

This is not hyperbolic; it is hope for our future. This is not alarmist; it is advocacy for our children. This is beyond volatile; it is vital to our survival.

V. Volatile

However, the current system determines that human survival is defined as the individual rather than the species. Survival is not attached to intelligence. Survival is a direct result of selfish reproduction and arrogance. I personally almost did not marry my wife because she wanted kids. I refused to give my brain to future generations.

Over time, I realized that being an educated and thinking person leads to existential crisis and often suicide. If the darkness and despair win, the species overall diminishes. If any individual removes themselves, the world

suffers. Not because of sadness, but because those who do commit suicide are often volatile; they are excessively creative and bear the burden of entertaining.

I'm fatigued, not with this pandemic but the plague of foolishness. This plague upon fools are ideas that suicide is selfish when selfishness actions are what makes the world so incorrigible at times that those with disorders consider removal. This is literally killing us with our own hands.

To ultimately leave the cave to avoid exhaustion and asphyxiation, the darkness may be interpreted by some as advocating for suicide. The advice: *do not go towards the light* reveals the cyclic nature of our return to the depths of the unknown. The ability and ambition to return to the cave in search of others who will continue to search alongside you.

Still, to inspire resistance without reason is to incite riots without resilience. The system also becomes too volatile to be sustained. The rebellion against systematic oppression and the existential dread leads to a complication between *The Rebel* and *The Trial*.

The Rebel by Albert Camus considers the nature of the human condition in an absurd universe. Camus searches to define the term: *rebel* by questioning the epistemological conclusion of Rene Descartes: *I think, therefore I am*.

Descartes establishes that each human knows they exist in the universe because they are a thinking thing. Even if Descartes' reasoning is circular, Camus concludes that our existence is not confirmed by *thinking* but instead by *rebellious*.

Often, we suffer in solitude, celebrating our own awareness while enduring the meaninglessness of life against an indifferent universe, all in isolation. Upon rebellion, suffering this strange separation from everything and everyone ironically becomes the universal collective experience plaguing us all. It is at that moment that the oppressed say *enough* that they not only bring themselves into existence but all of us. The conclusion of Camus: *I rebel — therefore we exist*.

The complication comes with answering: *rebel against who... or what?*

Affirming our existence with rebellion implies that there is a *them* for *us* to rebel against. The current public school system is embedded with those same absurdly convoluted bureaucratic systems and infused with the same powers of oppression, these Crucible Schools imply this should be upending.

However, it is the current school system that shares unnerving similarities to the original allegory of the cave. The origin of oppression and indoctrination extends from beyond the school hallways and into the halls of Congress that govern them.

The Trial by Franz Kafka presents an absurd, unjust, and convoluted bureaucracy wandered by K. The term *Kafkaesque* exemplifies the *tyranny without a tyrant* concept coined by Hannah Arendt. This bewildering complexity of the oppressive system that perpetuates itself without an oppressor appears to be another replicator that exists beyond the genetic and memetic identity of a human. The rules of the labyrinth of legal procedures, including the reason for the arrest of K, are unknown to K and even the reader.

Complex systems of governance are an emergent complication beyond our individual understanding. To stand against the *man* in opposition is simpler than understanding that one is a part of the machine they are raging against. Afraid of his writings' influence, Kafka requested friends to burn the library he himself wrote after his death. Despite being celebrated worldwide, Kafka remains banned in his own country.

Unfortunately, like our own country, the school system is a hospital and prison including both life support and restraints. A cynical, cyclical system that silences science, defunds education and burns libraries, ultimately sabotaging our democracy. However, rebellious youth may cut the tubes of life support themselves while attempting to sever the restraints. Opening up too much compromises the wall. Caves collapse after too much sun shines in. Even light has limits.

The focus therefore becomes:

How to help the youth learn to rebel successfully?

Often, the children of the previous generation perceive conflict with their parents as the battle to fight. This uprising against authority and the outgrowing of adults is essential. However, without a method of protest and activism provided, the response of most governments and institutions is punishment or removal. To the extreme, prison and death are equivalent to the principal's office and expulsion.

The volatile nature of adolescent and teenage rebellion is comparable to an explosion. Built up over time, the suggested tolerance of injustice wears thin until the ticking bomb of desperation destroys the opportunity. The recommendation to wait until the children are grown and can assume power at the appropriate age reinforces assimilation into the system.

Students often forget the possible challenges and changes they could create in the government. By graduation, students reach the previously ascribed defeatism and embrace survival under the crushing debt of each attempt to attain the dwindling opportunities for success.

Instead, they must bear their own fire, and become their own Prometheus, redefining personal success by avoiding the ghosts of idealism and subsequent defeat. Instead, the kings of dust must be removed from government by students determined to be activists rather than serfs. Instead, to avoid removal, nonvolatile reactions to the oppression must be taught within these Crucible Schools. Otherwise, traditional education graduates cylinders who fall in line.



.CHAPTER SIX. GRADUATED CYLINDERS

Currently, schools are pressured to graduate cylinders. Not those from geometry or scientific glassware, but those that contain combustion in an engine. Those who keep the machine of the system running are revered as ideal students and upstanding citizens. Public education systems train them until the blue and white collars eventually look alike. With approved rebellions and permission-form protests, they are caught in revolutions. Not revolutions that break the machine but revolve while resolving nothing.

Patterns of materialism give way to the cycle of working for money. Money spent to purchase environmentally a destructive, materialistic, antiquated culture. Culture pushed by time-consuming media, watched by the populous to escape their resentment of work. Work they do for the companies that promote the pattern of materialism.

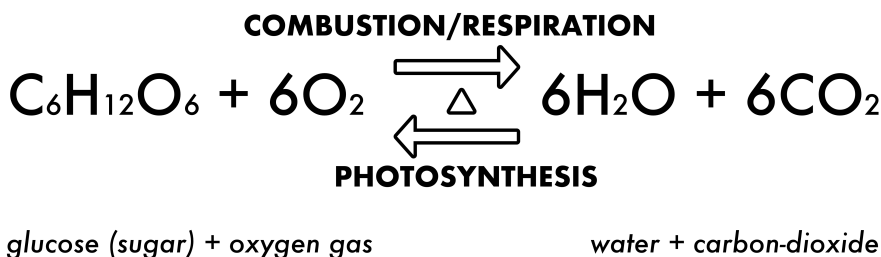
Like rebellion against this status quo, fire can produce many productive and destructive forces. Consider the distinction between the uncontrolled release of widespread shrapnel from a bomb and the focused accuracy to propel a bullet. Without attention all fires reduce to merely ash, likewise, any resistance without direction perpetuates rather than propels. Regardless, combustion is *change*.

I. Air

The chemical reaction of combustion provides an approach to provoking and accomplishing political and societal change. Ultimately, combustion is changing a carbon-based fuel in the presence of oxygen gas into carbon dioxide and water.

Students can find the burning of these reactants to make these products in biology as well. Your metabolism is simply a version of combustion inside your cells. Commonly quoted, *the powerhouse of the cell*, your mitochondria, are simply combustion engines burning the sugar you consume into usable energy. Metabolic combustion is called respiration.

The equation below is an idealistic representation of the process. Carbon monoxide (CO) is an unwanted byproduct of incomplete combustion. This odorless but poisonous gas attaches with greater affinity to the hemoglobin in red blood cells. As a result, oxygen gas (O₂) cannot bind, and one suffocates molecularly while poisoning themselves. Oxygen gas becomes a limiting reagent causing toxins to build in the body since respiration cannot complete the reaction. This is the same way candle snuffers work.



By giving them an incomplete education, you are setting the students up for failure. Yet, this is the nature of reality, the idealized balanced equation above, is far from the actual outcome of education. Chemistry through stoichiometry calculates the actual percentages of the products using molarity. Public education could aspire to balance equations between schools, but this is beyond idealistic.

A balanced equation in chemistry is actually math. It holds no practical application until it is connected to the physical world. The bewildering concept of molarity applies the mass of each atom of the different elements inside the molecules using the periodic table to go from an equation that appears perfectly balanced to the real world on the truly visible scale by weighing the different reactants. If this concept creates confusion, it is because it requires the establishment of many concepts not addressed in public education. So often this balancing of equations is the extent of the lessons.

When real resources, reactants, are placed into the formula, weights as numbers that apply to cups of water and spoons of sugar. Instead, consider chemistry as baking with ingredients replacing the word *reactants*, and the word *pie* replacing products. The recipe provides the equal parts that are

required for the best outcome: a perfect pie recipe as a perfectly balanced equation. Everything is accounted for and equal.

Now, imagine having less sugar than needed for the pie. You have to modify the recipe, or another option is to borrow a cup of sugar from your neighbor. Traditionally a cup of sugar is the expected volume provided by the neighbor. However, if you only require a spoonful for the completion of your pie, the additional sugar becomes waste.

Cooking and baking are chemistry. Similar to spoons of sugar, chemical engineers use stoichiometry to maximize profits while eliminating excess and reducing pollution. Equality treats all the same. Equity considers the circumstances, and meaningful equality of opportunity treats some differently. Equality wastes sugar. Equity maximizes the size of the pie.

Balanced equations are an unobtainable idealistic equality. Stoichiometry is actionable, pragmatic equity. This is why we calculate and measure reactants to maximize the desired products from the limited resources available. Crucible Schools must be the graduated cylinders from science classrooms: transparent and equitable. Graduated cylinders meticulously measure resources with accountability, not to redistribute wealth equally but to maximize products through equity.

The maximization of the entire system across the country requires avoiding the waste of reactants, or resources because other limiting reagents produce unwanted outcomes. Basing public education funding on the taxes of the community increases performance for those with the wealth to acquire the resources.

However, Crucible Schools require equitable distribution without preference of location or the benefits of birth. Instead, this redistribution of wealth within the school system, in contrast to charter and privatization, is for the survival of the species instead of personal gain. Selfish competition is the unnecessary by-product that occurs when an idealistic balanced equation. Current school competition deliberately justifies survival of the "fittest" against the individual and cultures rather than the fittest generalization and explanations.

Comparable to the oxygen required to breathe, limiting the resources of public education through oversight, negligence, or deliberate defunding produces the suffocation of public education. Like water, inhalation and exhalation, as is the ebb and flow of oxygen, require society to let go of previous selfish dedication to dated methods of funding education. Clinging, like holding one's breath, results in the toxic poisoning of oneself with our own waste products.

Through stoichiometry, reducing the limiting reagents ensures the cyclic relationship to not poison ourselves. Equity distributed to the diversity of schools, students, and communities is required for the realistic survival of our species and planet. This is beyond idealistically balanced equations on legal paper like a confirmation exercise worksheet. This is a pragmatic practical application scribbled on a wide rule science notebook during a legitimate lab discovering the green solution.

Even more strange is that the carbon dioxide (CO_2) becomes the sugar ($\text{C}_6\text{H}_{12}\text{O}_6$) and the oxygen gas (O_2) you inhale is often the by-product of plants splitting two water (H_2O) to undergo photosynthesis. Among the odd realizations of this reaction is that fire produces water. Balanced budgets should help us understand where funds may go. However, the funds that are supplied should not be justified by equality.

Equality is accounting. *Equity* is accountability. The atoms have a specific destination like the funds invested in education should. This ensures our investments result in desired outcomes. Knowing where the air we need to breathe actually comes from ensures we do not suffocate huffing on leaves when we just need to water our plants.

II. Water

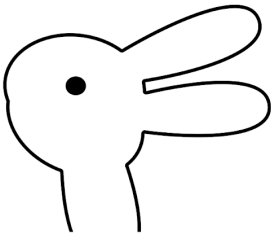
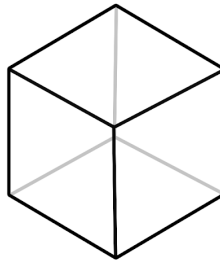
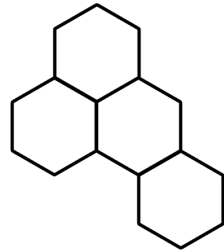
In the simplified allegory of the cave, upon leaving the shadows the former prisoner looks upon a nearby stream. The water mirrors the movements and shapes of the observer. For Plato, these were the reflections of the ideal forms and objective truth.

In contrast, a pre-Socratic philosopher, Heraclitus suggested a doctrine of flux: one cannot step into the same river twice since nothing is constant and all is changing. This presents an extension of this allegory, that the reflection

is of oneself, in this case, the educator. Similar to Eastern philosophies, characterized most notably by the martial arts movie star Bruce Lee, one's own adaptability can be compared to water. Fluids take the shape of the vessel into which they are poured. Tea takes the shape of the cup. The mind is not a vessel to be filled but rather the fluid that adapts to the vessel.

However, the continuation of a water-like mindset into adulthood, including educators, is difficult to maintain since the anatomical structure of the brain limits the creativity needed for new approaches to old persistent problems facing our planet.

Neuroplasticity diminishes as neuronal pruning removes ideas of unicorns and tooth fairies. This is an unfortunate by-product of wisdom and the survival strategies of predicting the future applying deductive reasoning to concerns. Inductive reasoning through the investigation of a learner's own inquiry and formation of their own conclusions through experimentation, even beyond the science classroom, and evidence collection encourages students to create new conceptual frameworks and paradigms. This produces unique approaches instead of burdening them with the conclusions of antiquated crystallization.

**DUCKRABBIT****NECKER CUBE****HEXAGON TESSELTION**

Teachers ultimately must be acquainted with the idea of paradigmatic shifts and the assumptions that commonly contain and self-affirm their belief structures. These paradigms are robust and endure even when faced with contradictory evidence. Simply presenting the teachers and students with a Necker Cube might immediately illustrate this idea like Thomas Kuhn and Ludwig Wittgenstein did.

The children's book *Duckrabbit!* illustrates the same concept. As teachers and learners draw their interpretation of the cube or state that the picture represents a duck or a rabbit, they can realize that not just perceived assumptions are challenged. The edges of their paradigms prevent us from thinking beyond the box.

Learners should be allowed to approach the box, Necker Cube, to redefine it. Water-like flux-capable mindsets allow the center six lines to be removed, creating a hexagon. This reduction of a 3D cube to a 2D hexagon provides a way that simplification presents a paradigm beyond our previous understanding as adults.

A fixed form-based mindset about learning itself is the most difficult thing to alter. This comes from adults' attachment to objective truth. An academic understanding of education allows for flux and generates an idea that disregards the cube entirely, romantically thinking outside the box. This flux is actually an oscillation between frameworks based on boundaries imposed by other ideas. Instead of the generation and overall acceptance of the idea, the selective pressures imposed by the teacher—through perceived wisdom—bottlenecks creativity, stifles innovation too quickly, and fails to allow for intense proliferation.

To resolve this issue for both the youth and adults, learners and educators, diversity is essential. The community, when intentionally pursued to make it as diverse and contrary as possible, smashes entire paradigms together fusing the now hexagons of subjective truths into a tessellation of a honeycomb hive.

This reduction of negative and wasted space forces contrary ideas into a complementary framework. This is beyond thinking outside the box but allows the plurality of boxes to coexist and approach truth from angles unimagined by the fixed form-based mindsets of educators.

Again applying the comparison of truth to a perfect circle, approaching it from a diversity of angles provides the most useful version for the survival of humanity. A resulting honeycomb of connected Necker Cubes provides paradigms that allow us to shift between new ambitiously predictive

frameworks invented by learners instead of defeatist prophecies adopted from the teacher.

III. Neutralization

Diversity of ideas is essential for the survival of the country the same as diversity of genes is for the species. Inbreeding within organisms produces many genetic issues for the species. Selecting for specific extremes or traits eventually reduces the survival of an organism when challenges of the environment change or increase. Consider how well a small dachshund or toy poodle would fare if returned to the wild without the assistance of humans. This bred dependency allows for one disease or pressure to remove the entire breed.

The lack of diversity within a dichotomous political system reduces the survival of the country. Escaping the two-party stranglehold on democracy may be pragmatically impossible. However, the representations of the lack of diversity based on population density and geography create a daunting and isolating effect. The representation of a *blue dot in a red state* immediately moves the country toward a heterogeneous mixture of ideas and approaches.

The country has been compared to a *melting pot* and, in contrast, *the great American experiment*. The argument that the individual states are laboratories where political parties test out versions of autocracies, can be paralleled to the use of state governments to create volatile reactionary politics by moving to the extremes of the party. This extremism deepens the dependency of the youth on the old. Crucible Schools promote the movement of these discussions and experimentations from the state level into the safety of a classroom using the fluid intelligence of students.

As the country becomes more heterogeneous, the subset communities become homogeneous. The heartland is described as a red ocean speckled with blue islands. However, the concentrated blue islands in urban areas create isolationist echo chambers. The defunding of public education and the movement to charter and private schools reduce the diversity of ideas in all areas. This essentially destroys the opportunity for creativity through the combination of conflicting ideas.

The movement to a heterogeneous mixture of the entire country reinforces the *blue dot in a red state* identity of the heartland. This is a product more of self-segregation as those who identify as blue move to densely-populated, concentrated city centers, and the vast rural landscape is depleted to a thin red of minimal participation.

The connection of blue dots generates a web of participation from the underrepresented populous. However, the true resolution to the problem is the steady natural diffusion of the concentrated self-proclaimed diverse cities into the geographic interior of the country. Instead of deepening the hue in urban areas, the missing shades of blue must be discovered and others must be redistributed to the rural areas of the country. To realize this completely, the homogenization of the country would reflect the purple mixture of the professor.

The phrase *litmus test* is often used in politics to say what is acceptable and sorting political and moral positions into categories. These litmus tests reveal the true character of the individual. However, this term is directly lifted from chemistry when sorting solutions into acidic and alkaline. The litmus test in chemistry measures the percent of hydrogen ions (pH) in a solution. In water (H_2O) with a pH well below 7, strong acids quickly dump hydrogen ions protons (H^+) into the mixture as the strong base, with a pH well above 7, aggressively accepts the hydrogen ions onto the hydroxide ion (OH^-), producing neural water at the less dynamic pH of 7.

The lower the pH, the more acidic; and the higher the pH, the more alkaline, or basic. A litmus test that determines the character of a person as progressive would be extremely volatile entering a regressive community. Similar to adding a strong acid to a strong base, the neutralization of the solutions is literally explosive. Releasing concentrated *progressives* into areas dominated by *regressivism* does not produce diversity.

A slow neutralization of the acid and base, through increased communication, changing the conversation requires reframing the discussion beyond parties. An immediate diffusion without an established commonality will be perceived as replacement, rather than rehabilitation. The volatile and ultimately toxic reaction of adults moving families to spread from urban areas to rural areas will not allow for Crucible Schools to

be the laboratories needed to generate the creativity within the system. The combative and aggressive attachment to personal truth will only generate conflict that corrupts and ultimately destroys the system.

Students, teachers, parents, guardians, families, and communities must accept that truth as a perfect circle remains unattainable. This paradigm must shift no matter how gradual. The shift of this paradigm falls upon the education of students by teachers that commute to areas of needed attention. Programs must push into rural areas with technology and professional development.

Weakened by defunding, teachers have been forced from areas of depleted resources. To move toward new solutions, investment from the wealthy suburban and affluent urban areas into neglected urban and abandoned rural areas provides the resources to rebalance the entirety of the system. These areas sheltered from the effects of the defunded rural areas are the direct cause of the collapse of the heartland, hollowed out in search for their own upward mobility in pursuit of the personal American dream. This dreamworld is another experiment exploring how to create autocracies.

As named by David Pepper in *Laboratories of Autocracy*, these experiments undermine democracy. Currently these experiments are contained at the local and state levels by targeting the state houses. However, the fate of the country rests on changing the conversations between the concentrated blue populous and thin red rural landscapes. Gravitating to the coasts to escape the erosion of rural education and collapse of the heartland will inevitably cause democracy to fall.

Likewise, the request to find a perfect centrist candidate to unite the dichotomy of acid and base, red and blue, with hostile and violent prejudices ignores the responsibility of the individual to produce change. Centralization can not be contained in a purple party president but requires the slow diffusion and neutralization of the entire country.

Investment in the diversity and the diffusion of ideas in all public schools, particularly urban and rural allows the future generations to prevent the predicted toxin from destroying us and allows the students to generate the green tonic to save us. The confirmation exercises toward a purple poison by

the wise elders have led to defeatism. The predictions have become self-fulfilling prophecies.

IV. Matter

Expected results have become prophecies that accept a fate without any agency and accountability. Polls during elections function as predictions in politics, similar to how people form hypotheses in high school. A high school student who didn't do the reading for the day of the lab just writes down whatever the day of. An undereducated guess, under-researched, and with their gut, they change when challenged. This misses the purpose of the experiment or exercise.

The science teacher glances at all the manuals just for completion credit. Then, after the lab, the students erase the lightly pressed pencil before turning it in at the end of class. They correct their guess without gaining the education.

Before the general elections in the primaries, national parties often chose the party-approved candidates over the publicly favored candidates. Despite popularity, national parties choose these basic candidates with super-delegates weighing the decision. Past upsets in presidential election history have put the candidate without the popular vote in power. The polled presidential favorite many times has voters make the hypothesis that they will have a landslide victory. However, out of spite and disappointment for the party approved primary candidate being chosen as the nominee over the popular primary candidate, voters abandon the party entirely and vote for the other party's candidate in the general election.

Those with the unchosen primary candidate hypothesis doubled down on their choice as if *only my candidate was chosen...* and those with the party-approved candidate hypothesis blamed the primary voters who supported the unchosen for not uniting under the party.

As if still in high school, they will always conclude that their hypothesis was correct because they think they have to have it right for the A in the lab. Teachers want students to be wrong on the hypothesis and instead get the conclusion correct. Educators want students to learn. Learn that being right

in the polls doesn't matter.

It is the conclusion, the election, that matters. It is that students learn from these concentrated think tank labs in these Crucible Schools: Winning doesn't mean getting it perfect in your undereducated guess. Perfection is not progress. Education requires failure. Reflection requires relinquishing your ego.

This is not because you, your *self*, your identity doesn't exist. Rather, your opinion, your expertise—from your passion to your authority, from your calling to your reasoning—your vulnerable vote and honest participation instead of perfection, matters.

One must alter the attachment to perfection and abandon the need to be correct in your opinion to survive. Instead, the growth mindset must adapt to new information and evidence. There is no finality to fluidity. Flexibility admits failure. There is no end to education. This requires that society changes the way teachers teach. To prevent passive populace, teachers must promote political engagement and participation.

Teachers have consistently adorned themselves with shackles to be among those chained in the cave, to avoid being stigmatized as radical. However, the comfort of the cave is collapsing. Public education must teach students how to engage in the world of politics.

Teachers must challenge the threats to science, diversity, and critical thinking. Teachers must be advocates for change to save the county, species, and planet. Teachers must educate the ignorant and challenge the arrogant. Teachers must be catalysts inside and beyond the classroom.

V. Catalyst

Catalysts are chemical agents that speed up chemical reactions but, in the end, remain unchanged. Instead, a co-creation of knowledge requires the abolishment of ageism from the school system to promote the potential of progress over the repetition of regression.

We should adapt as the students adopt the country. The false dichotomy created between pedagogy and andragogy perpetuates a system of

separating the learner from the instructor based on age rather than experience. If adults, teachers, and elders embrace the potential students offer, then students define the purpose of education rather than merely meeting the demands of productivity. The assumptions of andragogy are a more accurate representation of how the facilitation of learning should occur for both children and adults.

Imagination and innovation can require massive investments of time without a single artifact made. Depending on the size of the problem, hours, days, and years, may pass with not a pixel placed or a letter typed. It remains all in the mind until it just pours out in a stream.

Compare this to the effort it takes to set up dominoes. The time is spent establishing all that potential energy. Then, tip the first domino, and watch the show. We must learn when to step out of the way of students and ourselves. As a true catalyst, trainers, instructors, and teachers help set dominoes on edge and the student's potential does the rest.

Athletes in the zone, authors caught in the flow, and musicians lost in the rhythm, something else seems to be just using them. Some musicians say that the best songs don't even feel like they wrote them at all. Songs did not belong to them then, and when they heard them on the radio, the songs were not ever theirs anyway. The audience and the world have always owned them.

The brain loses neuroplasticity as humans age, and time compromises the approach to new problems with a water-like growth mindset. Water shapes stones over time. Therefore, the adult and teacher must vigilantly approach each interaction with learners with intentional ignorance. Often the oppression extends from the experienced older adults down to the growing youth.

The youth's dependence on the adult is manufactured from infancy to childhood to adolescence, and into adulthood, and many forms of resistance against the educational system result. These rebellions, volatile and often counterproductive, result in further reprimand and assimilation into the adult-approved system. They are justified by previous generations providing the rationale and enforced with appeals to authority. Prejudice against the

elderly is a repercussion of overextending assumed wisdom without encouraging children to form justifications of their own.

Ageism against younger and older generations must be dismantled to promote the combination of the most diverse ideas separated from each other merely by time. The elderly must engage the youth with patience and attentiveness to creatively evolve new innovative strategies to preserve life in all forms.

Teachers must not only question students' misconceptions and arrogance but also challenge any system that produces or promotes misinformation and ignorance. Teachers inspire the embers, stoke the flames, and help harness the light of curious fires to illuminate our journey out of the darkness of ignorance and arrogance. Education as science is a process of acquiring the evidence that allows them to inductively answer the burning questions for themselves. Students must become their own catalysts for change.

We must provide opportunities in the heartland instead of depleting the most vital resource: the minds of innovators. Allowing and advocating for the ambitious to leave the rural interior of America erodes the heartland further. This suggestion makes ghosts out of their homes and grinds their earth to sand. The way out is to encourage them to question and challenge their future monarchs. We must place trust in the student to remove the barriers of undereducated guesses imposed by aspiring kings and the shackles of the hidden curriculum to end the oppression of the exploited gerontocracy.

The destination is the rural areas, emerging families rebuilding the collapsing interior. The ambition is to ensure a country and planet for the following generations. The solution is to redesign the hollow heartland into a home for our children to innovate their own futures.

Science must be prescriptive and *stand in the way* of the undereducated guesses of our governance silencing science. Schools must be crucibles investigating their burning questions to *lead the way* beyond the hidden curriculum. Students must be empowered to *innovate the way* out: the survival guide for their country, planet, and future.

.PAST DUE.

Moments before the bell, I realized I withheld my own recommendations.

Diligently devoted to science, non-fiction, and academic articles, I never shared the novels that inspired and empowered me. Snatching a post-it note from my desk, I start scribbling a list: *additional required readings*. Running out of room on the yellow square, I panic under the pressure of running out of time. Debating which will provide the most lasting impressions.

I write *1984* by George Orwell at the top, not as a warning but as a strategy. *Doublethink*: to hold two contradictory thoughts and simultaneously believe in both equally. Through torture, Winston is forced to profess $2+2=5$ in Room 101. I imagine a similar room in a Crucible School. Instead of torture, though, conflicts between ideas do not compromise compassion for the human.

Imagine a classroom with transparent equity. Imagine a collection of classrooms connecting concepts between content areas in separate contexts. Imagine a web of these radically diverse classrooms networked worldwide across the world to collectively innovate infinite positive-sum games between worthy rivals rather than enemies. Imagine investing time in addressing the situations discussed in books instead of trying to ban them.

Ironically, like me, post-its have also lost their initial purpose. Designed as bookmarks to flag hymns, they are now frequently used to make lists. Lingering notes remind us there is more to do, instead of marking references to those quotes that inspire us. We have exchanged encouragement and


empowerment for nagging accountability.

Each of these titles is in my library at home. Books I inherited or purchased. Books I bought from a store or through paying the replacement fee. They are shelves of permanently *past due*. Some are pristine. Others have the prestige of post-its and personal annotations.

As the list finishes, I notice another commonality. With the authors' names stacked on the sticky note, the perspectives I privilege become obvious. The list remains dominated by authors who look similar to the majority in positions of power. My advice offers very few voices of minorities. Even those that resist are themselves those that are already historically more published.

Far past due is adding diverse voices to my personal library.

Far past due is reading the realities beyond the comfort of my cave.

A vertical flame, primarily yellow and orange, rises against a solid black background. The flame has a dynamic, wavy shape. At the base of the flame, there is a white hexagonal logo containing a stylized 'K' or 'Y' shape. Below the logo, the website address 'www.NICHOLASANTHONYLINKE.com' is printed in white. The flame appears to be burning on a dark, textured surface, possibly wood or charcoal, which is partially visible at the bottom.

**I believe that
empowering students with the ambition
to change the world they are inheriting,
as well as equipping them with
academic and social tools
to accomplish those changes,
is the true purpose of education.**

- Nicholas Anthony Linke



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