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Theory and Practice of Dramaturgy

Protocol Essay

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### Brecht on Science: The Development of an Ethic

*Life of Galileo* is a play as immense and sprawling as the ideas it contains. Brecht's cerebral epic dramatizing the authoritarian control of knowledge and the scientist's social responsibility to society boasts fifteen scenes populated by over fifty characters and spanning a period of 28 years. Brecht abolishes heaven with Galileo's discovery that the earth revolves around the sun, eliminating the ideological divide between earth and heaven and between oppressed and oppressor in one fell swoop. The very act of questioning the Church-endorsed cosmology pokes holes in the infallibility of the entire religious, economic, political, and social order that the institution upholds. Any production of the play must necessarily grapple with these logistical and thematic complexities, a Herculean task by any definition. However, the centrality of this text to Brecht's oeuvre offers invaluable theatrical guidance, making the task of staging it infinitely less daunting. Dissecting *Life of Galileo* as a parallel to the playwright's aesthetic Bible "Brecht on Theatre," examining the play as a sort of ethical case study in "Brecht on Science," provides a conceptual framework that brings the practical aspects of production into sharper focus. Just as Galileo turned his telescope on the seemingly incomprehensible heavens to reveal their inner logic, viewing the play through this theoretical lens enables the constellations linking Brecht's theory, work, and continuing relevance to emerge.

Brecht was nothing if not a disciple of reason and rationality, of Francis Bacon and Galileo Galilei. Marxism applied scientific thought to social relations; Brecht in turn applied it to art. The fundamental axiom of Brecht's theory, the foundational principle upon which he erects his theater, are that critical thought and truth are necessarily socially good, that "Propaganda for thinking, in whatever area it is made, is useful to the cause of the oppressed." (*Galileo* 148)

Brecht sought to inculcate this "propaganda for thinking" in the theater, to establish a theater of pleasurable learning for the modern skeptic. He worked from the premise that "modern man is a child of the Scientific Age, which has made him, above everything else, inquisitive, skeptical, and critical. His pleasures, including his theatrical experience, must correspond to these character traits." (Hill 146) Brecht's project then was to inject the aesthetic with the scientific, to apply scientific insight to society, to educate through entertainment.

Brechtian scholar Claude Hill particularly emphasizes the playwright's allegiance to science as an art form. Citing Brecht's obsession with dialectics (the inherent contradictions in events and characters), his plans to write a play about Einstein and another about Oppenheimer, and his extensive research in astronomy, physics, and science in general, Hill unambiguously concludes that Brecht "did not conceive of the Scientific Age as a mere cipher for Marxism but really used the term in both its literal and general sense. When he described the introduction of the footnote to the theater as one of his aims, or remarked that modern audiences ought to get the same experience as readers who can turn back the pages of a difficult book, he was simply paraphrasing habits that modern science has created." (Hill 155)

In *Life of Galileo*, Brecht not only explores science as a subject, but employs science as a methodology. While the play may not superficially embody Brecht's most radical theatrical experiments, the sweeping historical narrative *does* most fully embody his aesthetic philosophy

and the tension between his intellectual attraction to science and to Marxism. His oft-cited obsession with the historical, the dialectical, and the epic find their fullest expression in his undeniably epic play starring Galileo as a dialectically-fraught Renaissance man of the 17th century, Brecht's full-bodied personification of science and reason itself. Brecht's own estimation of *Life of Galileo*'s central occupation in his oeuvre can be further inferred from the play's prominence in his seminal *Short Organum for the Theater*, a self-entitled "description of a theater of the scientific age" that outlines his aesthetic principles at their most cohesive and refined. Tracing the line of scientific inquiry through his theoretical writings and tracking their expression in *Life of Galileo* reveals how the central tenets of his aesthetic (Marxism, dialecticism, historicism, epicism, alienation, pedagogy, and sensuality) all derive from the scientific, and in turn how these tenets form the core of the play.

As previously mentioned, Brecht certainly regarded science as embracing a Marxist view of history as well as the natural sciences. Though an avowed Marxist, it could be argued that Brecht's commitment to science was at least as strong or even stronger than his commitment to communism. Scholars widely acknowledge that "although Brecht clearly was a Marxist playwright, without a doubt he was also a Marxist heretic." (Mews 45) That the appeal in Marxism was in its application of science to society offers the simplest explanation for Brecht's imperfect allegiance to the Party line. In that sense, Marx can be understood as an inspirational muse rather than an ideological straitjacket, a point of departure from which:

"Brecht wanted the theater to do what Marx suggested the philosophers ought to do: not just to interpret the world but to change it... In contrast to the pure scientist who is mainly concerned with the nature of things, the theater is concerned with the actions of men. It

must show them in as scientifically valid a way as possible, and this, in turn, means in the light of Marx, who was the first and most influential thinker to apply scientific methods to the social world.” (Hill 156)

This essentially describes Brecht’s intellectual affiliation with Marx’s method rather than its manifestation, with Marxist thought rather than with Marxist realpolitik. At the same time, it acknowledges Marx’s undeniable fingerprint on Brecht’s work. In *Life of Galileo* truth is depicted as a malleable commodity for sale to the highest bidder, as a strategic pawn for those in power—the Catholic Church can bribe the sun to orbit the earth. Furthermore, Brecht and Brecht’s Galileo share the Marxist belief in the capacity for human reason and the assumption that knowledge will inevitably lead to revolution. Add to this the prominent influence of class relations in the play, with representatives from the religious peasantry, the urban artisans, and the feudalists highlighting science’s social impact as a central theme. Monk Fulganzio of peasant origins abandons the order after Galileo convinces him to prize reason’s potential for revolution over faith’s prescription for complacency, but then returns to the Church after Galileo’s recantation. Federzoni the lens grinder follows Galileo as an eager disciple of science and progress until Galileo’s recantation sends him back to the workshop. And Ludovico the feudal lord anxiously identifies Galileo as a potential creator of unrest until the scientist’s eventual recantation cements the stability of the feudalism.

Explicit and implicit references to science permeate “Brecht on Theatre: The Development of an Aesthetic,” the text widely acknowledged as the most definitive, comprehensive overview of Brecht’s theories. In it he speaks of the artist’s imperative “to raise the theatre to the level of science” and of “the invaluable services that modern knowledge and

science, if properly applied, can perform for art and specially for the theatre.” (“Brecht on Theatre” 29; 73) This imperative extends naturally from his understanding that:

“In an age whose science is in a position to change nature to such an extent as to make the world seem almost habitable, man can no longer describe man as a victim, the object of a fixed but unknown environment. It is scarcely possible to conceive of the laws of motion if one looks at them from a tennis ball’s point of view. For it is because we are kept in the dark about the nature of human society as opposed to nature in general – that we are now faced (so the scientists concerned assure me), by the complete destructibility of this planet that has barely been made fit to live in.” (“Brecht on Theatre” 275)

If science is the key to understanding and altering human nature as well as Mother Nature, Brecht presents the theatre as a petri dish in which to replicate and critically examine the underlying laws of the social universe just as physicists have studied the laws of motion.

This cross-pollination between social science, science, and art in Brecht’s psyche is visible in the fact that, other than Marx, the single two chief influences on his writings appear to have been none other than the renowned physicists Francis Bacon and Galileo Galilei. Numerous idolizing references to these Renaissance men pepper his theoretical works and observably inspired *Life of Galileo*. For example, Brecht draws heavily on Francis Bacon in his portrayal of Galileo, borrowing and adapting Bacon’s conceptions of science as work against infinite error rather than towards infinite truth and of science as a primary means of improving men’s living conditions. Meanwhile, Galileo receives the ultimate homage in Brecht’s decision to dramatize his biography, to tackle the life and legacy of the so-called Father of Modern Science. The play

marries Brecht's adamant belief in Bacon's assertion that "Man is the interpreter of nature, and science is the correct interpretation" with Galileo's articulation of change as a benevolent force:

"Whether or no literature presents them as successes, each step forward, every emancipation from nature that is scored in the field of production and leads to a transformation of society, all those explorations in some new direction which mankind has embarked on in order to improve its lot, give us a sense of confidence and triumph and leads us to take pleasure in the possibilities of change in all things. Galileo expresses this when he says: 'It is my view that the earth is most noble and wonderful, seeing the great number and variety of changes and generations which incessantly take place on it.'" ("Brecht on Theatre" 202)

The importance of this last quote to Brecht is evidenced by its appearance as an epigram to the entire play in the printed version of *Life of Galileo*.

In addition to appropriating biographical and intellectual content from the two physicists, Brecht borrowed their literarily scientific writing style. Brecht's *Short Organum for the Theater* formally and stylistically suggests Bacon's influential *Novum Organum* while Brecht's "Messingkauf Dialogues" expounding upon the nature and role of the theater not only seems to be a direct descendent of Galileo's revolutionary *Discourse on the Two New Sciences*, but also temporally coincides with Brecht's first draft of *Life of Galileo*. This insight situates the play as a sort of staged Socratic dialogue, urging a production to revel in the words as actions, to find the drama in debate, to milk the sprawling intellectual arguments that make up the bulk of the play for all their dramatic twists and turns, advances and reversals, victories and defeats.

Therefore, in production, it's important to capitalize on the aesthetic appeal of the logical and the scientific, the beauty Brecht noted in his assertion that:

“Today one could go so far as to compile an aesthetics of the exact sciences. Galileo spoke of the elegance of certain formulae and the point of an experiment; Einstein suggests that the sense of beauty has a part to play in the making of scientific discoveries; while the atomic physicist R. Oppenheimer praises the scientific attitude, which ‘has its own kind of beauty and seems to suit mankind’s position on earth’.” (“Brecht on Theatre” 180)

Recognizing this awe-inspiring beauty is key to preventing the play’s unusual focus on the content and methodology of science from becoming a stultifying liability—it’s the difference between a field trip to Hayden’s planetarium and a high school astronomy lecture. It would be irresponsible to gloss over the importance of scientific integrity to Brecht’s aesthetic sensibility, to ignore the fact that he took pains not only to get *Life of Galileo*’s astronomy and physics content fact-checked by an assistant of Niels Bohr in Copenhagen (Hill 112) but to construct a structurally scientific narrative in the sense that each scene presents a “carefully chosen set of circumstances that demonstrates a principle.” (Turner 153) Each scene offers evidence to weigh in determining our final judgment of Galileo as friend or foe to the advancement of reason and rationality, in evaluating whether there’s more credibility to Andrea or Galileo’s hypothesis, or whether the answer might even lie in a synthesis of the two. In production, working with the play rather than against it will allow the scientific content to acquire a poetic, metaphorical force and for the structure to read as a series of active, exciting experiments.

Brecht made no secret of the fact that he intended the sum of these experiments to lead the audience to the conclusion that Galileo should be condemned rather than celebrated. However, like a good scientist, he retained the contradictory complexities in his dissection of Galileo's character, refusing to tailor the evidence to suit his theory. Galileo echoes this wariness of certainty and this commitment to constant doubt in his formulation of the purpose of scientific inquiry as "not to establish that I was right but to find out if I am." (*Life of Galileo* 76) Brecht's claim that this is the most important line in the play signals the importance of dialecticism to science as a discipline and of *Life of Galileo* as a theatrical paean to that discipline. Discovery is the engine of progress and doubt is the way to discovery. In proving the Copernican Model, Galileo "...will explore every alternative theory before reluctantly accepting the bold revolutionary one...Brecht means the same attitude to apply to social phenomena; he was as wary of those who always propagate revolution as of unshakable conservatives." (White 59) Brecht demonstrated this duality both in theory and in practice by relentlessly rooting out the dialectical nature of his characters and the situations he put them in.

In his theoretical writings Brecht praised the presence of dialectics for both their practical and pleasurable potentialities:

"The theatre of the scientific age is in a position to make dialectics into a source of enjoyment. The unexpectedness of logically progressive or zigzag development, the instability of every circumstance, the joke of contradiction and so forth: all these are ways of enjoying the liveliness of men, things and processes, and they heighten both our capacity for life and our pleasure in it. Every art contributes to the greatest art of all, the art of living." ("Brecht on Theatre" 277)

In *Life of Galileo* these dialectics abound, generating dynamic intellectual friction. Objects appear in contrasting contexts with jarring resonances--for example, references to Galileo's scientific instruments are later replaced with the Church's instruments of torture. The axis of the story itself hinges on the see-saw between "brave and cowardly, passive and active, good and bad." (Bentley 230) Galileo starts out in Venice with lots of intellectual freedom but little time and money and ends up in Rome with lots of time and money and little intellectual freedom. Galileo displays courage in the plague and cowardice when faced with torture. Galileo preaches his commitment to the revelation of truth, but fraudulently passes himself off as the inventor of the telescope, writes obsequious letters to the royal Medici family he disdains, prostitutes his intellect to help the Church subjugate the peasantry, and, finally and most damnably, recants the truth.

In his theoretical writing, Brecht defends himself against charges of unrealistic character inconsistency by positing that the intrinsically dialectical nature of man actually receives its most accurate portrayal through contradictory characters:

"Even when a character behaves by contradictions that's only because nobody can be identically the same at two unidentical moments. Changes in his exterior continually lead to an inner reshuffling. The continuity of the ego is a myth. A man is an atom that perpetually breaks up and forms anew. ("Brecht on Theater" 15)

With this atomic metaphor, Brecht once again couches his theory in scientific terms, this time identifying the dialectical in the scientific. Indeed, through *Life of Galileo*, Brecht explores

the dialectical nature of science: its potential to act as a means of progress and enlightenment or as a weapon abused by those in power; its struggle to act as a rational discipline despite the fact that it's practiced by emotional beings. As a demonstration of its potential, Galileo espouses Copernican theory as a means to empower the masses but then delivers himself as a weapon into the hands of the Church; as a depiction of its struggle, Galileo's appetite--ravenous for both scientific knowledge and Epicurean delights--is his greatest strength and his greatest weakness, motivating both his contribution to science and his failure to society.

Brecht's portrayal of Galileo as "a rationalist who lives by his instincts" (Gray 112) therefore acts as a theatrical embodiment of the realization that, "science [is] not the abstinent, sexless, and selfless enterprise of pure reason or of objective empirical or experimental rationality which it [is] presumed to be. Rather, science [is] presented as a more fully human activity, involving personal motives, social forces, and nonrational determinants." (Wartofsky 8) In their attempt to reconcile the rational and the instinctual, Brecht and his Galileo remain dialectically pinned between the demands of science and of philosophy, between rational observation and ideals, between critical detachment and committed action. By Galileo's own reckoning, he fails in this attempt due to cowardice. The paradox at the heart of Marxism and Brecht is the paradox at the heart of Galileo's oppositional character, of their "double-pronged project – to know AND to change the world." (Gouldner 79) The Galileo that condemns himself at the end of the play in uncharacteristically impassioned language can therefore be understood as the philosopher Galileo criticizing the scientist Galileo for knowing the world but not endeavoring to change it.

But why did Brecht funnel these thematic concerns into the 17th century instead of the 20th? The answer lies in another critical tenet of Brecht's theory—historicization, the technique

of setting plays in the past in order to effect a critical distance between the audience and the events depicted on stage, to frame the narrative with a more objective perspective than could be achieved by directly depicting current events. Here Brecht applied science to history as “a way of treating society as if all its actions were performed as experiments,” (“Brecht on Theatre” 195) and by selecting particular historical ‘experiments’ in order to “provide a little model of what the playwright believes is going on in the present.” (Bentley 15). In this way, Brecht repurposed the life and times of the greatest physicist of the seventeenth century as a means of exposing that the same societal and historical forces are still in operation today, to suggest that the twin giants of Catholicism and feudalism Galileo was pitted against have merely been reincarnated and renamed. Brecht co-opts Galileo, historically “a loyal son of the Church tormented by the heretical implications of his discoveries” and transforms him into a proto-Marxist spokesman for the triumph of doubt over faith. (Bentley 54) Therefore, this play is not intended to be an accurate history lesson, nor is it a demonstration of timeless humanity in a historical setting—it is the performance of a social experiment situated within specific historical circumstances in order to provide a thought-provoking foil to our time. Through the alienation of a historical subject, the audience is asked to extrapolate from the play’s action, to ferret out its similarities to the present and examine its contemporary consequences. The trick in production, then, is to retain the historicity without sacrificing the critical detachment. One solution, adopted by Brecht’s set designer Caspar Neher for the Berliner Ensemble’s 1957 production, is to “set Galileo in front of projections of maps, documents and Renaissance works of art,” thereby forcefully conveying the particular circumstances of time and place without sweeping the audience away on a transporting tide of period drama. (“Brecht on Theatre” 203)

But historicization is only one of the primary applications of Brecht's infamous alienation effect, a potentially misleading translation that actually refers to his constant striving to make the familiar strange. By Brecht's own definition: "A representation that alienates is one which allows us to recognize its subject, but at the same time makes it seem unfamiliar... The new alienations are only designed to free socially-conditioned phenomena from that stamp of familiarity which protects them against our grasp today." ("Brecht on Theatre" 192) Alienation, then, is deployed on the stage to combat the habitual perceptions that prevent people from confronting the reality of the present moment, forcing them to re-examine the world as if they're an alien from another planet (another possible, if whimsical, derivation of alienation). Of course, this is also the scientist's project--to critically examine everyday phenomena, finding the laws of gravity in a fallen apple and the moon's orbit in the ocean's tides. Brecht himself explicitly makes that connection when he writes that:

"Characters and incidents from ordinary life, from our immediate surroundings, being familiar, strike us as more or less natural. Alienating them helps to make them seem remarkable to us. Science has carefully developed a technique of getting irritated with the everyday, 'self-evident', universally accepted occurrence, and there is no reason why this infinitely useful attitude should not be taken over by art. It is an attitude which arose in science as a result of the growth in human productive powers. In art the same motive applies." ("Brecht on Theatre" 140)

So in his articulation of the alienation effect, Brecht yet again transposes the scientific onto the theatrical, turning the theater into a laboratory where social situations are thrust under

the microscope. Galileo is even specifically cited as an inspiration in connection with this concept:

“To transform [oneself] from general passive acceptance to a corresponding state of suspicious inquiry [one] would need to develop that detached eye with which the great Galileo observed a swinging chandelier. He was amazed by this pendulum motion, as if he had not expected it and could not understand its occurring, and this enabled him to come on the rules by which it was governed. Here is the outlook, disconcerting but fruitful, which the theatre must provoke with its representations of human social life. It must amaze its public, and this can be achieved by a technique of alienating the familiar. This technique allows the theatre to make use in its representations of the new social scientific method known as dialectical materialism. In order to unearth society’s laws of motion this method treats social situations as processes, and traces out all their inconsistencies.” (“Brecht on Theatre” 192-193)

Therefore, by Brecht’s reckoning, in the same way that actual and fictional Galileo’s practice of alienation enabled him to deduce nature’s laws of physics, the theater’s practice of alienation will enable audiences to deduce “society’s laws of motion.” *Life of Galileo* textually employs title projections and musical verses to this effect. At the beginning (and occasionally the end) of each scene, a short description of the action to follow deliberately robs the dramatic suspense from whatever is about to happen so that the audience will instead focus empirically on *how* and *why* it happens. The concurrent choral interludes amplify this effect, an auditory complement often ironically elaborating on the textual information. These musical verses also

function as antidote against the seductive pull of narrative, since the piercing notes of Baroque castrato belted directly at the audience can't help but shatter the fourth wall, forcefully reminding them of their presence in a theater.

Anti-illusionist acting and stagecraft can aid this project, by further punctuating the alienation effects already inherent in the text and by helping to maintain that critical distance where the text falters on that front. As just one example, in the National Theatre of London's 1979 production, during the elaborate opening sequence "an extraordinary sight could be glimpsed beyond the shutters: two burly, shirtless men strenuously heaving the winch handle helping to effect an apparently effortless transformation. It was an image that Brecht might have relished." (Hiley 188) The lesson here is to never let the audience forget that they're an audience--without constant vigilance, the play is in danger of slipping into historical melodrama, a situation where spectators' "eyes are open, but they stare rather than see, just as they listen rather than hear." ("Brecht on Theatre" 187) Brecht's Galileo echoes this contempt for unthinking consumption when he chides Andrea in the opening scene: "You can see, indeed! What can you see? Nothing at all. You just stare. Staring isn't seeing." (*Life of Galileo* 8) The distinction here is that 'seeing' "the world involves applying one's intellect; 'staring' is mere observation without analysis." (Turner 152) Alienation counteracts this unreflective and intellectually unengaged mode of existence; it vanquishes the enemy of Brecht's theater *and* Galileo's science.

Historic histrionics are off the table, then. Brecht forgoes plucking the heartstrings in favor of stimulating the synapses—his intended target is the mind, not the heart. By replacing the therapist's couch with the pupil's desk, Brechtian theatre embraces pedagogy in pursuit of its self-prescribed twin commandments—to educate and to entertain, an artistic expression of the

modern teacher's rallying cry "Learning is fun!" If this all sounds rather heavy-handed, that's because it is. Brecht would be the first to label his theatre as didactic, and the first to defend didacticism as a legitimate source of education and entertainment. Peddling parable and historical allegory, Professor Brecht comes to the theatre to teach: if not particular facts and figures, then an entire mode of thought, specifically a scientific mode of thought: to apply the scientific method of observation, theory, and experimentation to the social world. Brecht describes this as:

"that productive attitude in face of nature and of society which we children of a scientific age would like to take up pleasurably in our theatre...The attitude is a critical one. Faced with a river, it consists in regulating the river; faced with a fruit tree, in spraying the fruit tree; faced with movement, in constructing vehicles and aeroplanes; faced with society, in turning society upside-down." ("Brecht on Theatre" 185)

By this estimation, social progress will be attained through the same method as scientific progress. In order to achieve these practical aims, Brecht goes on to stress the importance that:

"...the right sort of thinking be taught, a kind of thinking that investigates the transitory and changeable aspect of all things and processes. Rulers have an intense dislike for significant changes. They would like to see everything remain the same—for a thousand years, if possible. They would love it if sun and moon stood still. Then no one would grow hungry any more, no one would want his supper. When the rulers have fired a shot,

they do not want the enemy to be able to shoot; theirs must be the last shot. A way thinking that stresses change is a good way to encourage the oppressed.” (*Galileo* 148)

In light of this passage, it’s no surprise that Brecht chose to dramatize Galileo’s struggle against those who wielded power by making earth and moon stand still, a microcosm of the dialectic between science and society. In *Life of Galileo* Brecht not only extrapolates socially and scientifically instructive content from the historical circumstances, but also crafts himself an instructor that embodies the playwright’s commitment to pedagogical alienation in both action and ethos. Everyone Galileo encounters becomes his pupil, and by extension so does the audience. Throughout the play, Galileo utilizes concrete experiment and empirical analogy in his pursuit of truth, a model of reason and rationality intended to edify the other characters (and the audience) in the exercise of scientific thought. Just a few examples of this scientific gestus include: the opening scene wherein Galileo ingeniously proves the tenability of Copernican theory to Andrea with a chair and an apple; the “proving stone” he keeps on his person like a talisman, pointedly dropping it as a physical demonstration of the undeniability of proof; and the ninth scene wherein he disproves Aristotelian theory to a gathering of his followers with a pan of water, paper, and a needle. This is to say nothing of his frequent paeans to and aphorisms about reason, and his constant insistence upon “questioning, making strange, doubting, rather than offering answers, inviting recognition, or confirming belief.” (Turner 145) It’s safe to say, then, that in *Life of Galileo* the stage becomes the classroom. Rather than fight that fact, a production would do well to embrace the lesson plan, to engage the audience on those terms, to channel a favorite professor’s teaching methods. The well-received New York Actors Theatre’s 1978 production represents an extreme adoption of this strategy: the entire play was staged in an actual

lecture hall at Columbia University and presented as a dramatized scientific debate. The cast was uniformly costumed in professorial robes and the intellectual pyrotechnics played out in front of slew of scrawled-on chalkboards.

Considering this powerful pedagogical aspect, *Life of Galileo* might be loosely interpreted as an inverted Christian morality play, an allegorical drama with the purpose of debunking religious dogma and instilling scientific doctrine in its place. Science offers a secular alternative to religious ideologies, supplanting the Bible's faith-based answers to mankind's eternal yearning for a theory of everything with its own reason-based ones. The ecstasy of scientific discovery as depicted in the play is comparable to theological revelation, as Galileo and his companions excitedly scan the breathtaking cosmos and engage in "experiments on stage which spread the ambiguous aura of wonderment and satisfaction because they are deceptively simple." (White 82) In fact, the hinge of the play, scene 8 out of fifteen, depicts a sort of secular conversion: Galileo, persecuted prophet of science, convinces the Little Monk to abandon the Catholic order and join his band of burgeoning physicists. At first, the monk attempts to argue that truth is not necessarily always superior to faith, that faith can mercifully reconcile people to their fate. But Galileo counters with a more powerful argument for the allegiance to science over belief, postulating that truth can instead set people *free* of their fate, that, as fellow scientist Francis Bacon put it, *scientia potentia est*-- "knowledge itself is power." Brecht's choice of Copernican theory as an embodiment of this idea finds a parallel in Karl Marx:

"The criticism of religion disillusions man so that he may think, act, and fashion his own reality as a disillusioned man comes to his senses; so that he may revolve around himself

as his real sun. Religion is only the illusory sun which revolves around man as long as he does not revolve around himself.” (Marx 63-64)

This describes exactly the disillusioned conclusion Galileo reaches once he disproves the existence of the Church’s ‘illusory sun which revolves around man.’ Destroying the Church’s false cosmology forces him to admit that God is therefore “in ourselves or nowhere,” that man must revolve around himself and can ‘think, act, and fashion his own reality.’ (*Life of Galileo* 26)

However, for all of the play’s religious criticism, Brecht cautions against limiting the play’s implications to a battle between science and faith, to staging a three-hour lampooning of the Catholic Church. He insists that “the church functions, even when it opposes the investigation, simply as authority.” (“Brecht on Theatre” 116) Of course, this does not preclude the debasement of faith and religiosity within the play. It’s not that Brecht doesn’t regard religion as an essentially conservative and oppressive ideology—it’s that he regards it as simply one of many. Elaborating on this point, he states:

“Anyone who understands the standpoint of the author will realize that this attitude implies no reverence for the church of the seventeenth, let alone of the twentieth century. Casting the church as the embodiment of authority in this theatrical trial of the persecutors of the champions of free research certainly does not help to get the church acquitted. But it would be highly dangerous, particularly nowadays, to treat a matter like Galileo’s fight for freedom of research as a religious one; for thereby attention would be

most unhappily deflected from present-day reactionary authorities of a totally unecclesiastical kind.” (“Brecht on Theatre” 117)

The stakes are high. Just because Brecht ultimately rejects the legitimacy of religion as a worldview, that doesn't mean he doesn't take the exercise of its authority seriously. *Life of Galileo* is not a satire--the scientist's ecclesiastical adversaries are equipped with razor-sharp intelligence and political acumen. It's therefore of utmost importance that the smallest part be played with the greatest clout in order to avoid trivial caricature--Galileo's opponents must not be robbed of their power and danger.

Obviously, *Life of Galileo* is a play steeped in science and faith, in truth and power—not exactly frivolous fare. Attempting to sustain that intellectual intensity through fifteen verbose scenes, no matter how compelling the dialogue, would compare to a three hour cram session without any rejuvenating study breaks. The fact that so much of the play deals in the heavens makes it all the more necessary to bring the action down to earth whenever possible. Luckily, Brecht intentionally leavened the cerebral and the celestial with injections of the quotidian, creating a world where milk is as important as ideas, where goose liver garners the same attention as scientific treatise.

This arises from Brecht's keen recognition that the brain is a part of the body, resulting in his conception of science and intellectual activity as rooted in sensual desire, as:

“...a need of the pure sort, as much as it is an instrumentality for the satisfaction of others needs. Any scientific ethos which loses sight of this, mistakes a crucial fact about science, and about reason. "Man by nature desires to know" says Aristotle. We are not only

cognitive, but theoretical animals. We enjoy learning, or knowing for its own sake. Truth-seeking is as much of an imperative for us as food-seeking or the need for social companionship. (Wartofsky 9)

Or, as Brecht succinctly puts the words in Galileo's mouth: "Thinking is one of the chief pleasures of the human race." (*Life of Galileo* 27) Science, then, can't be regarded as a disinterested discipline divorced from humanity, and any attempt to "purify" science by separating the two would be entirely misguided. Brecht expresses the idea that science is only as good as its social consciousness when he says that:

"Knowledge of the nature of things, so greatly and so ingeniously deepened and widened, is incapable, unless joined by knowledge of the nature of man and of human society in its entirety, of making supremacy over nature a source of happiness for mankind." (Brecht on Theatre 126)

He goes on to suggest that science and art share this moral imperative, "that both are there to make men's life easier, the one setting out to maintain, the other to entertain us." ("Brecht on Theatre" 185) Galileo, too, ultimately condemns the idea of knowledge for knowledge's sake, insisting that it must be directed towards the primary aim of easing human existence. In this way, Brecht qualifies his reliance on reason, refusing to place blind faith in the scientific pursuit of truth. Science is a sword that can cut both ways, evidenced by the fact that:

“In the course of our history, this has included the uses of reason not only to dominate nature, but also to dominate and exploit other human beings. We have historically sought our good in complex ways, and often at the expense of the good of others. So reason is not an unmitigated instrumentality for universal good. It develops as a means to concrete, differentiated ends, and reflects as well as informs a social history of wars, class oppression, and social domination, at the same time that its applications have also yielded the fruits of technology, social organization, and culture. Thus rationality has a history, and it changes as the modes of our social and technological praxis change.” (Wartofsky 9)

Which brings Brecht back to the body. For him, the ability to steer reason down the right course requires three square meals a day--moral health is inextricably bound up with physical: “first comes eating and then comes morality.” (*Life of Galileo* vii) Not that Brecht attaches any negative value judgment to this, in fact, he decries that “nothing needs less justification than pleasure.” (“Brecht on Theatre” 34) So his depiction of Galileo as a glutton constantly in pursuit of fulfilling his twin pleasures--sensual and scientific gratification--is not damning as such, for “If he were not the great sensualist he would not be the genius he is either...Brecht sees Galileo’s demands for physical comforts as justified.” (White 69) The problem isn’t that the man “loves physics as he loves food,” it’s that he betrayed his cause on a full stomach. (White 69) This fusion of robust intellect and appetite was important to Brecht, and he lauded Laughton’s 1947 Galileo as an exemplary portrayal of the “rare combination of ‘intellectual brilliance’ and ‘physical self-indulgence’” he was shooting for. (Mews 24)

Realizing the responsibility Brecht placed on science's shoulders, and the importance he placed on social and physical reality, offers clues into staging strategies. Productions can avoid staging a cold, clinical intellectual operation by seizing every opportunity to inject the proceedings with physicality and a visceral sensuality. As Gambon, director of the 1980 National Theatre of London's production, implored the actors: "Don't play it like *Private Lives* but be aware of the farts and grunts as well as the truth." (Hiley 91) Just a few opportunities for visual and auditory spectacle include: when Galileo appears shirtless in the first scene, vigorously washing, eating, and drinking milk all while lecturing Andrea; the two carnival scenes (the first a stately, religious masked ball; the second a raucous, secular celebration); the lavish dressing of the pope as a physical portrayal of his political transformation from liberal-leaning Cardinal Barberini to conservative Pope Urban VII; Virginia's persistent Latin prayer underscoring the scene of Galileo's recantation, answered by the tolling of the bell; and Galileo's ravenous feasting on goose as Andrea spirits away with the Discorsi. As an extension of this approach, the richly Renaissance dialogue suggests that the cast relish the text with the same Epicurean delight that Galileo displays for sunspots and red wine.

The term epic theatre looms over Brecht's legacy, and now that we've examined its constituent parts, we can assemble epic theatre as an encompassing whole. As Brecht used the term, epic theatre was synonymous with anti-Aristotelian theater. This entailed a rejection of catharsis achieved through empathy in favor of critical distance and detachment, and argued for the predominance of plot over character as an extension of valuing more highly the individual's struggle against socio-political forces over the individual's myopic struggle with his own psyche. Eschewing empathy and embracing episodic structure are thus dramatic means to scientific ends: the former technique turning subjective experience into objective observation and the latter

turning man from subject of sympathy into object of study. Just as the natural sciences “have made possible this vast alteration and all-important alterability of our surroundings,” “the concern of the epic theatre is thus eminently practical. Human behavior is shown as alterable; man himself as dependent on certain political and economic factors and at the same time as capable of altering them.” (“Brecht on Theatre” 184; 86) In his application of science to the social world, Brecht articulates a vision of political science that is as scientific as it is political: “Like the transformation of nature, that of society is a liberating act; and it is the joys of liberation which the theatre of a scientific age has got to convey.” (“Brecht on Theatre” 196) As Galileo’s anti-Aristotelian physics ushered in the “Scientific Revolution,” Brecht’s anti-Aristotlelian theatre hailed what he hoped would be a social revolution. So in many respects, Brecht’s theory of theater could be called Galilean, in derivation and in execution.

Executing epic theater as Brecht articulates it necessarily calls all of the previously discussed elements into service, and underscores the importance of “counteract[ing] the natural flow of sympathy to Galileo.” (Bentley 85). Laughton and Brecht agreed that “portrayal of Galileo should not aim at rousing the audience to sympathy or empathy; they should rather be encouraged to adopt a deliberate attitude of wonder and criticism. Galileo should be portrayed as a phenomenon of the order of Richard III; the audience’s emotions will be engaged by the vitality of this strange figure.” (*Life of Galileo* 133) Therefore, his increasing blindness should not be played so as to extract sympathy, and his faults and failures must be stressed as they occur so that his final self-condemnation seems justified and does not produce pity for him. Punching up the comedic aspects of the play as well as highlighting the other characters’ criticisms of Galileo’s behavior will also aid in this effort.

So what does all this add up to? Dissecting the tangled mass of Brechtian theory—the Marxism and the dialecticism, the alienation and the historicization, the religious and the sensuous, the epic and the didactic—revealed science as the main artery feeding the matrix. By that standard, Brecht’s blueprint for a theater of the scientific age finds its fullest expression in his play about the father of the scientific age: *Life of Galileo*. As one scholar has noted: “If Brecht is a scientist among poets, Galileo is a poet among physicists.” (Turner 153) In his theory Brecht reasons on Galileo’s behalf, and in the script Galileo rhapsodizes on Brecht’s behalf. *Life of Galileo* can therefore be understood as Brecht’s poetic treatise on science, both a love letter to and a restraining order on the application of reason and rationality. Like a living organism, the ethics of the play continuously evolved in Darwinian response to the political and scientific changes of its environment. Brecht finished the first draft with Margaret Steffin in 1938 and was still fiddling with it when he died in 1956, the three major iterations he left behind forming a sort of theatrical record of his ethical development.

The dropping of the atomic bomb—that infamous triumph of science and tragedy of politics—most radically rewrote the play. “Overnight the biography of the founder of the new system of physics read differently.” (“Brecht on Theatre” 122) Brecht’s journey from unquestioned celebration of science as the best hope of mankind to his reconsidered recognition of science as a malleable product of mankind (and therefore subject to exploitation) can be glimpsed through Galileo’s metamorphosis from a cunning hero to a cowardly anti-hero who allows the politically powerful—in this case, the Catholic Church—to act as the final arbiter of truth. Brecht’s own relentless updating of the script acts as an imperative for each new production to cater the work to the political zeitgeist. The Berliner Ensemble has certainly taken up this mantle since Brecht’s death, for example performing the Danish version of the text

(focusing on freedom of inquiry) in 1978 and the American version of the text (focusing on the scientist's social responsibility) in 1997.

So what does Galileo have to say about science and society in the 21st century? The mushroom clouds of Hiroshima and Nagasaki have dispersed and the Cold War has thawed. The imminent threat of nuclear holocaust no longer hovers; science no longer scares us. But *Life of Galileo* only becomes more and more relevant as the gulf between scientific knowledge and laypeople's understanding of it grows wider and wider. The fact that science seamlessly permeates the very fabric of our lives has rendered its presence unremarkable and apolitical. Nothing is in more serious need of Brecht's *verfremdungseffekt*. In many ways, science is a privileged discipline in America today, as unexamined and taken for granted as Catholicism in 17<sup>th</sup> century Italy. As American astrophysicist Carl Sagan described this dilemma: "We live in a society exquisitely dependent on science and technology, in which hardly anyone knows anything about science and technology." Being socially and politically literate now requires being scientifically literate; to be engaged citizens of the 21st century we need to be engaged scientists. No knowledge is pure—not even neutrons are neutral. Science is undoubtedly a wonderful tool, but as a tool its worth is determined by its wielder—hammers can pound heads as well as nails. It's up to us to make sure the hammer ends up in the right hands. Neither art nor science happens in a vacuum, and a lack of political direction in either discipline is a direction in itself, just as choosing not to turn is making a decision to go straight. Brecht's formulation of this responsibility is crystallized in his warning that, "For art to be 'unpolitical' means only to ally itself with the 'ruling' group." ("Brecht on Theatre" 196) *Life of Galileo* stages an important corollary: for science to be unpolitical means only to ally itself with the ruling group.

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