Research Article

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How does one Cosmotheoretically Respond to the Heat Death of the Universe?

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Abstract: This article asks what an adequate philosophical response to the certainty of heat death would be: the moment in the timeline of the universe when all possible energy transformations have been actualized and life, thought, and action cease to be possible. Through a reading of Hans Jonas's existential work on Gnosticism, the article begins by defining what is meant by the notions cosmotheoretical and cosmoethical as well as offering a description of what Jonas calls "cosmic nihilism." After this, the article looks at two extreme philosophical responses to heat death. The first response examined is by Friedrich Nietzsche, whose eternal return is shown to be a reactive philosophical response to the linear entropic finitude that heat death implies. The second response is by Ray Brassier. Different from Nietzsche, Brassier is shown to affirm the extinction that heat death promises. However, his insistence that heat death partakes of the transcendental *and* the real, but not the ideal, is demonstrated to be amphibolous. In the final part of the article, I offer what could be called a thermodynamic architectonic response to the heat death of the universe, arguing that heat death should be understood as a guiding transcendental Idea in the Kantian sense of the term.

Keywords: entropy, Brassier, Kant, nihilism, Gnosticism, Hui, cosmotechnics, thermodynamic architectonics

What is most prominently at stake in modern and contemporary conceptions of and responses to nihilism is the relation between cosmology, on the one hand, and philosophy – both theoretical and practical – on the other. Evidenced by Friedrich Nietzsche's cosmological response to nihilism in the form of the eternal return, Bertrand Russell's "hostile cosmos" from "A Free Man's Worship," Hans Jonas's studies of Gnostic cosmology, H. P. Lovecraft's cosmicism and more recently, British philosopher Ray Brassier's speculative extinctionism, the philosophical problem of nihilism can be framed as both *cosmotheoretical* and *cosmoethical*; that is, as the correlation between *how the cosmos is* and the *value, or lack thereof, of our thoughts and actions*. For Nietzsche, as it is for Brassier, the cosmotheoretical and cosmoethical problem of nihilism is specifically related to how one should respond philosophically to the cosmological conclusions drawn by the science of thermodynamics, particularly the inevitability of the death of the sun and, more apocalyptically, "heat death" – the moment in the universe's timeline where energetic transformations are no longer possible.

Like Nietzsche and Brassier, this article is concerned with how one theoretically and practically responds to the cosmological conclusions of entropy and heat death. It will, however, begin by outlining what "cosmotheoretical" and "cosmoethical" mean as they relate to nihilism. Since in part what this article aims to do is show how philosophically responding to something like the heat death of the universe could only ever be *cosmotheoretical*. To do so, I will place Jonas's existential philosophical work on Gnosticism and cosmic nihilism, particularly his essay "Gnosticism and Modern Nihilism," and the later epilogue to his 1958 *The Gnostic Religion* (the epilogue constitutes a rewrite of the earlier *Social Research* essay), in

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dialogue with contemporary philosopher of technology Yuk Hui's concept of cosmotechnics. The aim, then, is to develop the "cosmotheoretical" and the "cosmoethical" as cognates of Hui's "cosmotechnics." The purpose of this initial conceptual development is that it will serve to determine why both Nietzsche's eternal return and Brassier's speculative extinctionism (itself a response to Nietzsche) are inadequate cosmotheoretical responses to heat death and thermodynamics more broadly. The article will finally explore what I have begun calling *thermodynamic architectonics*, itself cosmotheoretical, arguing that as a critical philosophy inspired by Immanuel Kant, thermodynamic architectonics offers an alternative or more satisfactory means of responding to the nihilistic consequences of heat death by affirming heat death as a guiding transcendental Idea.[1]

1 Cosmotheoretical and Cosmoethical Nihilism

Although cosmic nihilism, understood as one "type" among many nihilisms, for example political, moral, epistemological, existential, and so on, most likely stems from Donald A. Crosby's clear overview of nihilism *The Specter of the Absurd* (1988), the term "cosmic nihilism" itself was first used conceptually, as far as research suggests, by Jonas in his 1952 "Gnosticism and Modern Nihilism."[2] Notwithstanding the importance of Crosby's definition and his division of cosmic nihilism into two further types: (1) the "meaningless *of the* cosmos" and (2) the meaninglessness of human endeavours *for and because of the* cosmos, Jonas's overview of the relation between gnostic "cosmic nihilism" and what he calls "modern nihilism" offers a richer conceptual equivalence for what I mean by cosmotheoretics and cosmoethics and its cognate status to Hui's cosmotechnics.

For Jonas, the modern European conception of nihilism is fundamentally cosmic, as per Crosby's definitions, dating it (as many have) to the disenchanting effects of Enlightenment science. He quotes Pascal as one of the "first existentialists" to have diagnosed its nihilistic cosmological consequences: "Cast into the infinite immensity of space of which I am ignorant, and which know me not, I am frightened."[3] As per Pascal's quote, what is at stake in the modern conception of nihilism is the extent to which the modern theoretical and practical advancement in astronomy and chemistry, undertaken, among others, by Copernicus, Galileo, Kepler, and Newton, decentred and dethroned the earth and man, altering the scale and hierarchy of value attached to the human and its activities. Jonas writes, "A universe without an intrinsic hierarchy of being, as the Copernican universe is, leaves values ontologically unsupported, and the self is thrown back entirely upon itself in its quest for meaning and value."[4] Man is one being among many, no longer connected to the transcendence of the cosmos. "Gone is the *cosmos* with whose immanent *logos* my own can feel kinship, gone the order of the whole in which man has his place."[5] What is more, that which distinguishes man from the rest of the beings of the universe, the reflective capacities, now appear as that which radically separate the human from the unknowing universe. Since "that which makes man superior to all nature, his unique distinction, mind, no longer results in a higher integration of his being into the totality of being, but on the contrary marks the unbridgeable gulf between himself and the rest of existence."[6] While God, in the Age of Reason, had not yet undergone total extirpation, the value of God's work no longer revealed itself as immanent to creation. For those that counted themselves among the enlightened, God's vision became *agnostos*, unknowable. The cosmic nihilism of modern European

1 I began the task of outlining the Idea of Heat Death in "Outline to an Architectonics of Thermodynamics," but it was likewise "applied" to the problem of transhumanist digital immortality in "Theoretical and Practical Paralogisms of Digital Immortality," *Journal of Aesthetics and Phenomenology*, (Forthcoming).

2 Jonas, "Gnosticism and Modern Nihilism."

3 Ibid., 430.

4 Ibid., 431.

5 Ibid.

6 Ibid.

Enlightenment is, therefore, one whereby the separation between God, Man, and nature is, absolute, where "every act of true reflection tells of his stark foreignness" to the rest of the community of being.[7]

The state of foreignness and its cosmological origins delimit the affinity Gnosticism shares with modern European nihilism. The Gnostic understanding of the cosmos, as is Jonas's task to demonstrate, was, therefore, no less alienating than Pascal's or our own. The situation that produced the Gnostic mereological separation between the totality of the cosmos and the human, "the part-whole relationship," was not caused by any scientific advancement in astronomy or chemistry (Gnosticism being a religious movement that begun in the first-century AD).[8] There was, nonetheless, an analogical alteration in the cosmic vision of nature that conditioned the emergence of Gnosticism as a dualism of "contrary terms."[9] For Jonas, the emergence of this dualism is historically conditioned by the fall of *Pax Romana*, and the correlated demise of stoicism as the leading ontotheological (in the Heideggerian sense) paradigm of the period. It would not be possible to outline the differences between the many currents (Sethian Gnostics and Valentinian Gnostics being two) of Gnosticism; it is enough, however, to say that the cosmic dualism expressed by the Gnostic movement is radically opposed to late Roman stoicism and the doctrine of harmony between life, the state and the cosmos as expressed by Marcus Aurelius, "Universe, your harmony is my harmony."[10] The cosmogony of Gnosticism could not be more opposed. It is one where a knowing (*gnosis*) uncreated spirit (*pneuma*) finds itself thrown into an unknowing (*agnosis*) created cosmos. For the Gnostics, the created cosmos (*Kenoma*), including man's body (*soma*) and soul (*psyche*), is the product of the demiurge (*dēmiurgós*, sometimes referred to as *Yaldabaoth*), one of the sons of Wisdom (*Sophia*) from whom he emanated. Mirroring the separation between man and God, the demiurge was likewise born alien to the *pleroma*, the realm of light where the Monad resides. Thinking himself alone, the demiurge created man and the Archons (the stars), trapping elements of the *pleroma* stolen from *Sophia* inside the human.[11] Man is thus an alien in his universe, a stranger at home: "Under this pitiless sky, which no longer inspires worshipful confidence, man becomes conscious of his utter forlornness, of his being not so much a part of, but unaccountably placed in and exposed to, the enveloping system."[12]

Fundamentally, Jonas's argument asserts that a comparable historical *a priori* materially conditions both "ancient" and "modern" nihilisms. That is, "an analogous (although in other respects very different) situation had given rise to an analogous response in the past."[13] What is at stake for Jonas, then, is not the question of whether human endeavour is *in actu* cosmically meaningless; Jonas is not himself a cosmic nihilist. What is instead significant is the correlation between how the cosmos is said to be at a given historical, religious, and cultural moment and the theoretical and ethical response to this cosmology. Concerned with the material mechanisms of the analogy, Jonas can diagnose the cosmotheoretical structure at work that brings cosmic nihilism to the fore in a given "situation." Jonas writes: "A cosmic nihilism as such, by whatever historical circumstances [the Enlightenment or early Christianity] or it may have been begotten, would be the condition in which some of the characteristic traits of existentialism might evolve."[14] As a result of comparing the affinity between modern European nihilism and Gnosticism, Jonas can offer an argument for how cosmic nihilism as a human thought arises and how it is modulated by a historically grounded, culturally specific governing cosmological model: cosmological dualism, or the gulf between mind and cosmos. The first of which, for the Gnostics, was initiated by a collapse of the Roman stoic polytheistic, cosmological, philosophical, and social episteme; the second of which was caused by the reformation, a slow diminishment of European-wide Catholicism and the concurrent rise in Enlightenment science; itself accelerated by certain technological inventions such as the telescope.

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7 Ibid., 430.
8 Jonas, *The Gnostic Religion*, 247.
9 Jonas, "Gnosticism and Modern Nihilism," 435.
10 Aurelius, *The Meditations of Marcus Aurelius*, 28.
11 *The Secret Book of John*, trans by Davies.
12 Jonas, "Gnosticism and Modern Nihilism,"
13 Jonas, *The Gnostic Religion*.
14 Jonas, "Gnosticism and Modern Nihilism," 433.

Indeed, this is what is meant by cosmotheoretical, that cosmology, as a cosmic environment of man, determines a specific "view of nature," and transductively structures the very architectonics of thought, what Jonas calls a "metaphysical situation."[15] Transduction, as I have defined elsewhere, means the mutual conceptual deduction of concepts across domains. Here, the domains are cosmology and metaphysics. There is, therefore, the potential for a multitude of cosmotheoretics, each dependent on the cosmological structure from which it derives transductively. Cosmotheoretics are, therefore, cognate to Hui's cosmotechnics since for Hui, as outlined in his *The Question Concerning Technology in China*, there are a multiplicity of technicities that are contingent on historically and culturally determined cosmological differences. As Hui writes in the introduction, cosmotechnics "means the unification between the cosmic order and the moral order through technical activities."[16] Hui's cosmotechnics as a cosmoethics is, therefore, radically anti-nihilistic, since its fundamental task is to reenchant the connection between man and the cosmos in their pluralities via the technical and its plurality. Cosmotheoretics could be said to be the activity by which a particular cosmic order, through the technical activity of philosophy, comes to unify an analogically determined theoretical structure, an architectonics – with architectonics understood to be itself a technical object formed through the technical activity of philosophical transduction.

As Hui indicates in his definition of cosmotechnics, both the cosmic order and the moral are untied (especially for Confucianism) via technical activities. That is, the technical qua cosmotechnics reveals the relation that a particular cosmology has to its ethical structure and *vice versa*. Therefore, there is an analogical relation between cosmotheoretics and cosmoethics, both of which find their unification in cosmotechnics. The task of unification, or the process of unification, is that of the aesthetic and the philosophical. In other words, art and philosophy as technical objects unify the cosmic order with the moral. As Hui writes in *Art and Cosmotechnics,* "the moral and the cosmic inform each other and coalesce in technical activities," of which both aesthetical and philosophical thinking is the means for such a convergence.[17]

It is worth returning to the example of Gnosticism as an instructive but negative form of how cosmology cosmotechnically unifies with the cosmoethical. For the Gnostics, sin originates from the creation of the *dēmiurgós*, the "craftsman" or "producer." Therefore, everything produced through technical means partakes in the evil of craft. Like the Platonic and Neoplatonic revulsion for mimetic art, for the Gnostics, fire, the technical element *par excellence*, is aligned to the *dēmiurgós* as his means of creation. Paralleling a logic formed by other Christian antinomianisms (Lutheran or Calvinist), for certain currents of Gnosticism, a merger of cosmological dualism and disgust of the firmament gave way to a form of libertarianism, whereby moral "law," as the technical product and domain of the stars (the archons), was sought to be overcome. Redemption was to be achieved through a form of Sadean "general license, which permitted the pneumatic the indiscriminate use of the natural-realm."[18] Another method involved the exhaustion of all earthly potentiality. Here, Gnostic salvation is reached by enervating all transformations of matter. Preluding Nietzsche's definition of modern nihilism as the self-devaluation of the highest values, the cosmoethical decadence displayed by Gnostic libertarianism produced a disregard and negligence towards the earth as well as the technical and organic beings present on it that parallels not only modern European nihilism in its ethical indifference but also contemporary European capitalist accelerationism. For the Gnostics, as for certain neo-reactionary deliria, the only way to exit the wheel of time is to spin it faster.

2 Nietzsche's Eternal Return: The Ressentiment of Heat Death

No scientific revolution in mechanics in the last couple of centuries, quantum mechanics included, has had such a radical impact on cosmology as the science of thermodynamics. While this might seem like a grand

15 Jonas, "Gnosticism and Modern Nihilism," 433.
16 Hui, *The Question Concerning Technology in China*, 19.
17 Hui, *Art and Cosmotechnics*, 189.
18 Jonas, *The Gnostic Religion*, 471.

claim, the thermodynamic revolution, which began with Sadi Carnot's rejection of perpetual movement in 1824 and culminated (at least in the nineteenth century) in the statistical formulation of the concept of entropy by Maxwell, Plank, and Boltzman, not only altered the very paradigm of science from the relation of forces to the relation between energy and entropy, but also set the cosmological arrow of time as inviolably linear. Whereas before thermodynamics, as Isabelle Stengers and Ilya Prigogine argue in *Order out of Chaos*, Newtonian cosmological bodies were taken to move in a predictable, infinite, and time-reversible manner, now the stars and the planets that orbit them were seen to move in an exhaustible, finite, and time-irreversible fashion.[19] Once viewed as the realm of the eternal, the universe was now shown to be as entropically fragile and subject to death as the lowliest of creatures. Indeed, so radical is the concept of entropy, thermodynamics' most essential and novel of scientific inventions, that it is hard to find an equivalent in the history of thought, Western, Eastern, or otherwise. Its radicality derives from the simplicity of its most intrinsic qualities, as formulated first by Rudolf Clausius, the German scientist who coined the term: "*The entropy of the universe tends to a maximum.*"[20] That is, entropy $S = \geq 0$; the universe's entropy cannot decrease. What this means for cosmology is that there will be a point in the timeline of the universe when the amount of entropy has reached such a point that no energetic transformations will be possible. The universe will enter its most permanent of states, a state of "eternal death,"[21] as it was first called by Helmholtz or "heat death," as Boltzmann subsequently termed it. Although the universe does not die upon the advent of heat death, it nonetheless marks the moment it will become eternally silent. As Rankine writes, henceforth, no "phenomena may exist."[22]

The question that arises once having taken heed of such a revolutionary paradigm shift in cosmology, suppose one were to remain faithful to Jonas's and Hui's comparable insistence that there is a structural relation between cosmology and metaphysics, is: To what extent has there been a cosmotheoretical or cosmoethical philosophical reception of thermodynamics? The answers to these questions have yet to be fully answered since there has been a surprising lack of philosophical response to thermodynamics, at least at the scale that could compare to the cosmotheoretical analysis of Gnosticism performed by Jonas. Having said this, while one would have to wait (in the continental tradition at least) for twentieth-century thinkers such as Simondon (though *l'entropie* appears only a couple of times in the published works), Stengers, Brassier, Bernard Stiegler, and now Shannon Mussett to write more sustained philosophical reflections that included entropy and heat death, at the end of the nineteenth century, several vital deliberations on thermodynamics were conducted as part of a debate concerned with the circularity or linearity of time. As Paolo D'Iorio writes in his highly informative "The Eternal Return: Genesis and Interpretation," "philosophers such as Dühring, Hartmann, Engels, Wundt and Nietzsche" all "tried to address this problem by using the force of scientific argumentation and of philosophical discussion."[23]

As several scholars, D'Iorio in particular, have demonstrated with rigour, Nietzsche's eternal return partakes of this debate. It should thus be philosophically evaluated as a cosmological – or even a cosmotheoretical – response to thermodynamics. Indeed, even before the first explicit formulations of eternal return from the summer of 1881 in Sils-Maria, where Nietzsche was engaged in reading Neo-Kantian Otto Caspari's *Der Zusammenhang der Dinge: gesammelte philosophische Aufsätze*, a book that cites Clausius' "Entropie,"[24] Nietzsche had engaged with thermodynamics as a result of Friedrich Lange whose chapter "The Scientific Cosmogony," taken from his *History of Materialism*, is cited by Nietzsche as early as 1865. While the present article shall concentrate on the relation between thermodynamics and the eternal return as outlined in the 1884–1888 *Nachlass* (due to their explicit thermodynamic nature), it is worth mentioning that Nietzsche's initial reception of thermodynamics in 1865 is somewhat contradictory.[25] That is,

19 Stengers and Prigogine, *Order out of Chaos*.

20 Clausius, *The Mechanical Theory of Heat*, 365.

21 Boltzmann, "The Second Law of Thermodynamics," 22.

22 Rankine, "On the Recognition of the Mechanical Energy of the Universe," 201.

23 D'Iorio, "The Eternal Return," 66.

24 Caspari, *Der Zusammenhang der Dinge*, 33.

25 All the *Nachlass* have yet to be translated and published by Stanford University Press as a part of the Complete Works of Friedrich Nietzsche edited by Adrian del Caro, Alan D. Schrift, and Duncan Large; that is, Volume 17: *Unpublished Fragments*

Nietzsche's citation of Helmholtz in an early lecture on Heraclitus, as found in Lange, employs Helmholtz's discussion of the death of the sun and the heat death of the universe to argue paradoxically for "eternal transformation."[26] This is fundamentally contradictory since both Helmholtz's 1854 "The Interaction of Forces" and Lange's "The Scientific Cosmogony," which cites Helmholtz, have as a single purpose (especially Lange) the critical refutation in Neo-Kantian fashion of infinite transformation and absolute eternity. Although this article shall not dwell on this contradiction or discuss at length the early citation of Helmholtz, it is worth noting that this Heraclitus lecture is one of the only places where support for Giles Deleuze's interpretation of the eternal return as the eternal return of difference can be located. As D'Iorio has quite convincingly pointed out, Deleuze's interpretation of the eternal return as a form of eternal creativity is textually unsupported and philosophically inconsistent with almost all of Nietzsche's writings on the eternal return, published and unpublished.

If Nietzsche's eternal return constitutes a cosmotheoretical response to thermodynamics, entropy, and heat death, then what type of cosmotheoretical response is it; what are its formal qualities? Does it seek to question, problematize, accept, or refute thermodynamics? And ultimately, is Nietzsche's response philosophically adequate? Before answering these questions, it is essential to foreground that one of the cardinal philosophical purposes of the eternal return is to be an active component in the affirmative project known as the transvaluation of values and, thereby, overcome European nihilism through the positing of an alternative cosmo*ethical* categorical imperative that no longer defers to the Christian moral law as its practical guiding ideal. As Nietzsche writes in a note from 1885:

> I likewise sought an opposite ideal [to nihilist pessimism] – a way of thinking that is the most exuberant lively and world-affirming of all possible ways of thinking: I found it in thinking the mechanistic worldview to the end; it truly takes the very best humour in the world to tolerate such a world of eternal recurrence as I have taught through my son Z(arathustra) – hence we ourselves included in an eternal *da capo*.[27]

It is likewise important to highlight that for Nietzsche, European nihilism, although it airs its head during the enlightenment, finds its root in the Platonic will to truth and, subsequently, Christian Platonism as the resentful negation of anything other than the unconditioned. As Nietzsche finishes the above note:

> In the end, I decided that for me the most world-denying of all possible ways of thinking is the one that denounces becoming, originating and passing away as bad in themselves and that affirms only the unconditional, the one, the certain, being.[28]

It is the will to abstract metaphysical truth that, finding its high point in rational enlightenment science, finally devalues itself. Thus, whether the eternal return is an adequate cosmoethical response to thermodynamics is likewise a question of whether the eternal return is an adequate philosophical response to European nihilism as that which derives from Platonic metaphysics.

The first thing one might say about the thermodynamics of the eternal return, as outlined by Nietzsche in the writings from the late *Nachlass* (some of the notes of which were first collected and published

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(*Summer 1886–Fall 1887*), and *Volume 18: Unpublished Fragments* (*Fall 1887–Winter 1888/89*) remain forthcoming. Since citing these fragments, book plans, and notes is far from uncontroversial, I have relied on four sources for the translations in English, Kaufman and Holingdale's, *The Will to Power*, which, although a translation of *Wille zur Mach*, kept the fragments on the eternal return together, rendering thematic or conceptual analysis easier; the newer Michael A. Scarpitti translation for Penguin; Struge's, *Writings from the Late Notebooks*, which despite the merit of presenting the *Nachlass* as *Nachlass* contains only one of the fragments on the eternal return, and lastly the recently published *Volume 16 Unpublished Fragments* (*Spring 1885–Spring 1886*) translated by Adrian del Caro. Where needed, I have checked the translations against the eKGWB to avoid any accidental misrepresentations and mistranslations of Nietzsche.

26 Greg Whitlock is correct to argue that this is the earliest citation of the eternal return, or at least something close to it. Nietzsche in *Ecce Homo* likewise admits that while the idea of the eternal return is Zarathustra's, Heraclitus could have quite as easily proposed it. Nietzsche, *Ecce Homo*, 110.

27 Nietzsche, *Volume 16 Unpublished Fragments* (*Spring 1885–Spring 1886*), 60.

28 Ibid.

together under the title "The Eternal Reoccurrence" in the posthumously edited *Will to Power*), is that they do not conceptually diverge, at least a great deal, from the last published formulation to be found in *Ecco Homo* where Nietzsche defines the eternal return as the affirmation of the "unconditional and infinitely repeated cycle of all things,"[29] nor do they alter the fact that the eternal return remains Nietzsche's most cherished of concepts, which is evidenced by Nietzsche's final words from *The Twilight of the Idols*: " – I, the last disciple of the philosopher Dionysus, – I the master of the eternal return."[30] However, what is different about the *Nachlass* is that they explicitly position the eternal return as a cosmotheoretical thermodynamic concept that has specific cosmoethical consequences. It would not be possible to assess the eternal return as a response to thermodynamics if it was not thought by Nietzsche to be such a response. It is the *Nachlass* that allows us to make such a claim with confidence. As Adrian del Caro points out in the afterword to the *Unpublished Fragments* (*Spring 1885–Spring 1886*), "in the case of the idea of the eternal recurrence…there are more 'remnants' about it in the workshop notes than there are published explanations."[31]

Many of the notes from this period belong to one of Nietzsche's envisioned book projects entitled "*The Eternal Recurrence*," in which cosmology was to be granted a place next to theory and practice. The eternal return thus constitutes "the two most extreme ways of thinking, the mechanistic and the Platonic…ideals," cosmotechnically converged or unified as a philosophical thought experiment. As such, its metaphysical and cosmoethical operation is well known: the "thought of thoughts," the eternal return, is to weigh heavy on those that cannot reply to the demon of the *Gay Science* by affirming the recurrence of the "nothing new."[32] "But where the danger is, also grows the saving power," as *Hölderlin* writes. For that which damns life to eternal recurrence also grants life a certain eternity in becoming. Only by metaphysically affirming the certainty of the eternal return of life in all its physical colours as "divine" may one finally overcome the life-denying ideal of Platonic truth. As per the 1885 note cited above, Nietzsche also views the eternal return as "the mechanistic worldview" thought to its end. To bring the mechanistic worldview to a conclusion through thought means philosophically overcoming the fatalism of "mechanism," by which Nietzsche included thermodynamic and Newtonian natural laws. The "mechanistic" ideal, understood as that which reduces life to monochromatic formulae, is overcome by the same affirmation through which metaphysics is. The eternal return must be as certain for thought as it is for nature. For what would be the cosmoethical weight of the thought of thoughts, if the eternal return were not also understood to be the law of laws?

The cosmological proof of the eternal return as the law of laws derives from Nietzsche's partisan relationship to mechanistic theory. An answer to the question relating to the formal qualities of Nietzsche's response to thermodynamics begins by taking note of Nietzsche's bias for the conservation over the dissipation of energy. That is, Nietzsche's consistent admission that the amount of energy in the universe is determined, coupled with his reactivity to the second law of thermodynamics, reveals what could be termed a certain *ressentiment*; here, *ressentiment* should be understood as a reactive structuring attitude whereby one's position (philosophical or political) is internally structured as the negation of the differing position. In a note from 1886, Nietzsche writes simply that the "law of the conservation of energy [*Energie*] demands *eternal recurrence*."[33] That is to say, the first law of thermodynamics, as defined by Clausius as "The energy of the universe is constant," mechanistically conditions the eternal return as certain or as "inevitable." Three other notes from this period disclose why Nietzsche takes this to be the case and why conservation and not dissipation is privileged.

The first two notes are from 1885 and contain both the negative and positive cosmological proof for eternal return. The negative proof argues that "Were there some unintended final state in store for it, this… would have to have been achieved already."[34] That is, the fact that "a state of equilibrium is never reached proves that it [a final state] is impossible." Nietzsche derives this proof by assuming that "an infinite amount of time has elapsed" and that there is a "determinate magnitude of force" in the universe. In other

29 Nietzsche, *Nietzsche: The Anti-Christ, Ecce Homo, Twilight of the Idols*, 110.
30 Nietzsche, *Twilight of the Idols*, 229.
31 del Caro, "Translator's Afterword," 481.
32 Nietzsche, *The Gay Science*, 194.
33 Nietzsche, *Will to Power*, 547.
34 Ibid.

words, if an "end" of the universe were possible, given an infinite amount of time, it would already be actual. Since it has not been actualized, a final state or end is thus not possible; the world and the intellect continue to develop as evidenced by experience. The third note comes from 1888.[35] It likewise contains the negative and positive proof of return but is explicit concerning what is meant by a "final state": "If, e.g., the mechanical interpretation cannot escape the conclusion that Thomson has traced out for it, that the world will arrive at a final state, then the mechanical interpretation is thereby refuted."[36] The final state of equilibrium that Nietzsche declares is logically refuted by its present non-existence is the thermodynamic heat death of the universe. This negative proof functions to condition the necessity of eternal return since it eliminates the logical possibility of teleological linearity, the main opposition to cyclical return.

If the world has no end, it has no beginning. For to posit a beginning is to posit a God-like power capable of pure creation *ex nihil* surreptitiously. Kant's antinomies of pure reason are thus sublated by the eternal return as a double no-saying: the first to entropic final states, the second to pure negentropic origins. If the cosmos has always been and will never end, then the cosmos must be cycling through an infinite cycle of events, argues Nietzsche. This constitutes the positive proof for return: "If an infinite amount of time has elapsed, then at some moment or other every possible combination must have been realized; and what is more, it would have been realized an infinite number of times."[37] As such, "The world is a cycle which has already been repeated an infinite number of times and plays its game *in infinitum*."[38]

One of Nietzsche's motives behind positing the eternal return of the same as a double negation of the absolute beginning and end of energy is his abhorrence for "being." This is particularly the case for the repudiation of heat death since for Nietzsche heat death, like nothingness, is as metaphysical as absolute permanence since its metaphysical feature is that of a state of non-becoming:

> If the world could in any way ossify, wither away, perish, sink into nothingness; or if it could reach a state of equilibrium; or if it had an aim at all which would in itself entail permanence, immutability and a final condition (to put it in metaphysical terms, if becoming could pass over into being or nothingness), this state should have been reached.[39]

In this case, Deleuze is correct. The eternal return of the same is thought of by Nietzsche as a form of perpetual becoming whereby "there is a fixed amount of force [in the universe], but its essence is in flux, eliciting, constraining."[40] This is to say that the quality of the constant quantity of energy of the universe is that of constant movement.

However, for Nietzsche, this is not a perpetual becoming of novelty or "infinite transformations" (something I have begun terming pure plasticity), an idea he criticizes for being tantamount to the positing of divine creation, but it is a perpetual becoming of the same combinations of energy that feeds itself on itself:

> The world exists; it neither becomes nor passes away. Or, rather, it becomes, it passes away, but it becomes without beginning and it passes away without end - it subsists in both... It lives on itself; it feeds on its excretions[...][41]

The scatological description of the motor of return as that which "lives on itself" exposes to what extent the eternal return of the same is nothing but "perpetual movement" functioning at the level of the cosmos. The inadequacy of Nietzsche's response to thermodynamics and as such to cosmic nihilism finally discloses

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35 The source for these three notes is most likely Balfour Stewart's 1876 *The Conservation of Energy*, a text Nietzsche made extensive notes on during the period of *Human, All too Human*, and which has an entire section on the "Dissipation of Energy" as per Thomson's formulation of the second law and a discussion of the "fate of the universe." Though of course, Nietzsche had likewise already read Helmholtz, Lange and Caspari as well as the other authors D'Iorio mentions such as Dühring and Hartmann.

36 Nietzsche, *Will to Power*, 584.

37 Ibid.

38 Ibid., 585.

39 Ibid., 584.

40 Ibid., 582.

41 Ibid., 583.

itself in these lines. Nietzsche's hatred for the so-called "metaphysical" and will to overcome nihilism determine a resentful attitude towards entropic death that ultimately takes refuge in the *deus ex machina* of perpetual motion. It is hard to think of anything more counter to Nietzsche's own criticisms of the history of metaphysics than the use of perpetual motion as the means of energetically conditioning the eternal return. The affirmation of the eternal return as an affirmation that seeks the transvaluation of values is affirmed not for itself but for "ulterior motives," ones that begin and end in ressentiment, for it is not a yes-saying but a no-saying to heat death by any means necessary, metaphysical, or not. For what could be more reactive than the foolhardiness of those that continue to believe in ideas such *perpetuum mobile*, the law of identity in mechanical form, despite it being both practically and theoretically disproved?

However, as Sjoerd van Tuinen writes in his forthcoming *The Dialectic Of Ressentiment – Pedagogy of A Concept:*

> observing the fact of ressentiment triggers no new momentum, it makes no difference in the way we think, it makes nothing transpire, but merely consolidates a chronic polemical state in which the critical truth of the statement and its plausibility remain at odds with one another.

In other words, simply pointing out the inadequacy of Nietzsche's response to thermodynamics is itself philosophically inadequate to the task of responding to the heat death of the universe since it constitutes nothing philosophically positive in and of itself. While it is no longer possible to affirm recurrence, whose condition of possibility has now been shown to derive from Nietzsche's ressentiment of heat death and the epistemic impossibility of perpetual motion, as the means through which to overcome cosmic nihilism, one should not likewise throw blind support to its opposite. Philosophy is not simply a logical two-horse race where if one proposition is seen to be false, its opposite is necessarily deemed to be true. The law of the excluded middle does not hold. In this case, this would mean a defence of heat death as that which necessarily conditions cosmic nihilism. As I will now demonstrate next, this is precisely the case with Brassier's response.

3 Brassier's Speculative Extinctionism: An Amphibology of Reflection

If Nietzsche circumvents cosmic nihilism through the resentful affirmation of cyclical return, then Brassier's project seeks to cultivate it. As is made clear in the "Preface:" "the disenchantment of the world understood as a consequence of the process whereby the Enlightenment shattered the 'great chain of being'" should be understood as an "invigorating vector of intellectual discovery, rather than a calamitous diminishment."[42] Withdrawing the assumption that it is to be overcome, one of the cardinal philosophical tasks of Brassier's nihilism is to offer philosophical insight into the theoretical problem of "correlationism," understood as the philosophical position, said to crystalize in Kant, that the object and subject cannot be thought as separate of their correlation. Positively put, Brassier's *Nihil Unbound* seeks to demonstrate that there is a mind-independent reality of which philosophy can speak and which remains distinct from, or outside of, its subjective mediation. As a compliment to Meillassoux's notion of ancestrality, which defends a speculative realism by affirming the reality of that which existed prior to the advent of mind, Brassier's speculative extinctionism, particularly the final chapter, "The Truth of Extinction," defends mind-independent realism via a negative speculative venture that considers the future of the sun's death and heat death as "true" limits that render all thought prior to their arrival null and void.

"*Nothing will have happened*."[43] The sun will have already extinguished itself. We will have already finished thinking, already stopped acting, and already died. Brassier's claim is that philosophy, once

42 Brassier, *Nihil Unbound*, xi.
43 Ibid., 205.

accepting of these inevitabilities, should construct itself anew, surveying and marking out new territory from within nihilism itself. As Brassier writes, "Nihilism is not an existential quandary but a speculative opportunity."[44] In this regard, Brassier's philosophical position, summarized by the question "How does thought think the death of thinking?," is analogous to Russell's from "A Free Man's Worship," itself also an extinctionism *à la lettre*:

> That Man is the product of causes which had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and his beliefs, are but the outcome of accidental collocations of atoms; that no fire, no heroism, no intensity of thought and feeling, can preserve an individual life beyond the grave; that all the labours of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius, are destined to extinction in the vast death of the solar system, and that the whole temple of Man's achievement must inevitably be buried beneath the debris of a universe in ruins – all these things, if not quite beyond dispute, are yet so nearly certain, that no philosophy which rejects them can hope to stand. Only within the scaffolding of these truths, only on the firm foundation of unyielding despair, can the soul's habitation henceforth be safely built.[45]

Cosmotheoretical in essence, Brassier's speculative extinctionism, as a realist philosophy, establishes itself through the affirmation that which cannot be experienced – the death of the sun and the death of universe – nonetheless offers an answer to the question "How does thought think the death of thinking?" by conditioning the quality of thought *a priori*: "Extinction is real yet not empirical, since it is not of the order of experience. It is transcendental yet not ideal."[46] Understood as a transcendental philosophy, which is to say, a philosophy that considers that which lies *a priori*, thought and action are deemed *always already* extinct. Nonetheless, speculative extinctionism is no idealism. Extinction is not an ideal moment towards which thought can orientate itself:

> Extinction has a transcendental efficacy precisely insofar as it tokens an annihilation which is neither a possibility towards which actual existence could orient itself, nor a given datum from which future existence could proceed. It retroactively disables projection, just as it pre-emptively abolishes retention. In this regard, extinction unfolds in an 'anterior posteriority' which usurps the 'future anteriority' of human existence.[47]

Without the temporal capacity for phenomenological anamnesis, we wait, as Dürer's angel, surrounded by insignificance. The objects around us, once tertiary reminders of the past, become devoid of any hypomnesic potency. In Brassier's cosmotheoretical time-moving perspective of the universe, we are immobile and in stasis. Extinction marches towards us.

However, without any value attached to thought – the always already of extinction having robbed it of any cosmoethical duty to intervene – what real possibility is there for a philosophical project that strives to build, as Russell writes, "scaffolding" on the "firm foundation of unyielding despair." That is, if the nonbeing of the *speculatively always already extinct* is transcendental to thought and action, conditioning it *a priori*, then by what right should any philosophy be built at all? Otherwise put, by what mechanism is nonbeing a condition of anything? An answer to this question appears several times in the final chapters of *Nihil Unbound*, through a critique of Deleuze's vitalism as well as via Nietzsche and Lyotard's reflections on the death of the sun, and is nothing less than entropy itself. For without the scientific force of entropy's inviolable tendency to dissipate energy, the truth of extinction would remain an untruth deprived of philosophical force.

Despite the merits of speculative extinctionism's acknowledgement of entropy, as well as its criticism of Deleuze's assessment of it as a transcendental physical illusion, speculative extinctionism does not, at least not with any philosophical or scientific thoroughness, build any philosophical scaffolding from what is, in nature, the truth of extinction.[48] That is, it is by no means a philosophy of entropy. It is not concerned with

44 Ibid., xi.
45 Russell, "A Free Man's Worship," 46.
46 Brassier, *Nihil Unbound*, 238.
47 Ibid., 230.
48 Dalton has likewise pointed this out in "The Metaphysics of Speculative Materialism," 687–705.

the actual mechanisms of extinction nor with how entropy strives towards non-being, but it is only concerned with the proposition that thought is always already non-being. In other words, speculative extinctionism is concerned with death but not with dying. Indeed, if the answer to the question "How does thought think the death of thinking?" finds its ultimate truth in the irreversibility of energy dissipation, which is to say, if to think the "death of thinking" is to think how entropy is the condition of (im)possibility of thought itself, then one might ask why does speculative extinctionism not pursue such a line of thought further.

In short, speculative extinctionism cannot construct a philosophy of entropy precisely because its placement of certain objects of thought (representations) such as heat death is amphibolous. Either through a faulty use of transcendental reflection or simply because the ideal has been intentionally closed off by Brassier, speculative extinctionism misplaces heat death into the wrong faculty. That is, such an object of thought being both absolute and unexperienceable, as Lange pointed out in 1864, characteristically belongs to the faculty of reason as a transcendental Idea. Brassier places it, nonetheless, into the faculty of the understanding where it short circuits the possibility of positively serving the construction of a cosmotheoretical architectonics of thermodynamics. What will follow now is the propaedeutic of such architectonics, itself to be constructed cosmotheoretically via a method I call *critical transductivism*.

4 Thermodynamic Architectonics: A Critical Transductivist Philosophy

The cosmological and philosophical origins of thermodynamic architectonics do not differ greatly from Nietzsche's eternal return or Brassier's speculative extinctionism. All three stem from a philosophical reflection on thermodynamics, entropy, the death of the sun, and heat death. Furthermore, like Brassier, thermodynamic architectonics does not refute heat death nor does it shy away from its annihilating consequences. Nonetheless, the response is not the same.

Thermodynamic architectonics major theoretical difference is in its approach to critical transcendental philosophy, namely, the extent to which Kant and the Kantian legacy (most prominently neo-Kantianism) figure and how an architectonic method might aid in responding to the philosophical problems that arise once thermodynamics in its entirety, including the conservation of energy, entropy, and heat death, is taken into consideration. Explicitly, where speculative realism turns to the real, thermodynamic architectonics remains within the realm of critical philosophy, and to a method that I call *critical transductivism*.

It is critical to the extent that it makes no claim to intellectual intuition, and it is transductive to the extent that the science of thermodynamics furnishes it with a model with which to formulate a philosophical system. Thus, in a methodologically comparable way, Kant's critical project is directed by a central question:

> *What are the thermodynamic conditions of possibility* (*of the objects*) *of experience and to what extent do these conditions delimit what is concretely possible for experience and for action?*

While speculative extinctionism was supposed to function as the preface to a philosophy built in the wake of entropic heat death, no philosophy can be built upon that which has always already fallen to ruin and which, at the same time, takes no notice of the operations of how and why things fall apart. Thermodynamic architectonics, in distinction, sets to construct a philosophy that takes its lead from the very thermodynamic operations that are at work in the dying universe. That is, thermodynamic architectonics responds to the above question by arguing that it is precisely due to the movement inherent to the entopic tendency that non-being may condition the being of something. As I have outlined elsewhere, the philosophical concept of entropy as it pertains to objects of experience dictates that entropy functions as the condition of possibility *and* impossibility of its being since for an object to be logically possible for judgment, it must be in a particular *energetic state* (what I have called elsewhere "quamity") of metastability – neither at thermal

equilibrium nor in a state of bifurcation. Entropic unbecoming is the condition of becoming since for any energetic system (life, thought, action) to maintain its individuating limits, energy external to the system must be dissipated. But the necessity of this dissipation concomitantly exhausts the future of the system's temporal continuation. To think or experience, energy in the form of food must be consumed and burnt metabolically. The burning of the calories of thought at a local individual level directly relates to the Idea of heat death as the reflection of the same general tendency. Put simply, thinking as an entropic phenomenon partakes of the Idea of heat death as one instance of the movement towards its entropic absolution.

Instead of refuting heat death's possibility, as Nietzsche, fixating on its nihilistic reality, as Brassier, thermodynamic architectonics thus attempts to transductively structure a philosophy that is cosmotheoretically and cosmoethically guided by heat death as one of its principle Ideas (alongside the Conservation of Energy, and heat death's complimentary Idea, the Past Hypothesis – the moment, likewise not possible for experience, in the history of the universe were entropy was at a minimum). As a transcendental Idea, architectonic thermodynamics follows the method of the "as if," as most rigorously outlined by Hans Vaihinger. That is, since heat death cannot be experienced, but is certain as far as we know, a philosophy of thermodynamics can only be safely built by acting *as if* heat death were real. The unity that is aimed at by means of the regulative Ideas of the reason is one that Kant takes to be projected, not one that can be shown to be given; it is only aimed at, giving the understanding goals. As Kant writes:

> [Transcendental regulative Ideas] have an excellent and indispensably necessary, regulative employment namely that of directing the understanding towards a certain goal upon which the routes marked out by all its rules converge, as upon their intersection. This point is indeed a mere idea, a *focus imaginarius*, from which, since it lies quite outside the bounds of possible experience, the concepts of the understanding do not in reality proceed; none the less it serves to give to these concepts the greatest possible extension.[49]

Placed into its correct faculty, heat death orientates thought as that which negatively unifies it. As I have written elsewhere, the "*Idea of heat death*…pertains to the absolute totality of entropy."[50] Furthermore, the philosophical strategy of defining heat death as a transcendental Idea (albeit a negative one) is that it frees entropy to function as a concept of understanding. What this means is that entropy can then fulfil its role as the *a priori* condition of (im)possibility of thought since entropy, and not heat death, is experiential, things in the world can be predicated and empirically observed as entropic; entropy can be said to govern the possibility of (objects) of experience. That is, whereas energy can be thought of as the "material" cause, as that which quantitatively underlies all things, entropy can be thought of as the "efficient" and qualitative cause. As Carnot and Kelvin first pointed out, without dissipation, there is no functioning heat engine (in an abstract and literal sense), and thus without dissipation, there is no thermodynamic work. The natural tendency for energy to dissipate is the *sine qua non* of all physical phenomena whilst likewise being their *causa nihil*.

5 Conclusion

In a similar way to Keiji Nishitani's "absolute nothingness," as outlined by Hui, the nihilism initiated by modernity – which, as Hui also points out, is European in quality – can only devalue itself. There must be an "overcoming of nihilism through nihilism," as Nishitani writes.[51] Life will not return; nothing will. However, overcoming nihilism should not likewise occasion an adolescent reactionary anti-modernism. The order of might over right that fascism offers is no answer to the meaninglessness of the cosmos, and neither is existentialism's call to radical freedom. In essence, both say that without order, the order itself

49 Kant, *Critique of Pure Reason*, 533.
50 White, "Outline to an Architectonics of Thermodynamics," 184.
51 Hui, *The Question Concerning Technology in China*, 254.

must be willed. Both betray Nietzsche's metamorphosis of the child in so doing. The triumph of the will should be replaced with the childish play of necessity. "History," both natural and human, "is a child building a sandcastle by the sea." The inevitable erosive nature of the water does not stop the child from building their castle. Erosion is the very condition of possibility of play. Without the erosive power of water, no sand would be fit for building.

It is only by affirming the cosmic nihilism of heat death that any ecological connection can be re-established between the parts and the whole, the present and the future. Teleology should be a teleology of the absolute end, where purpose and function are united through the entropic tendency that underlies all phenomena. Thermodynamic architectonics would then be a form of negative linear Stoicism since the *logos* of the whole, the Idea of heat death is not alienated from its parts. Entropic *logoi* adhere to and are governed by it as a guiding principle. The Absolute qua nothingness is revealed through entropic phenomena. They play a part in the quality of its actualization, speeding up or slowing down its advance. For while heat death shall never be for us – it cannot, and by its very noumenal nature, shall never be an object of experience – it nonetheless discloses itself as with us and we for it. It is the entropic condition of possibility of all energetic systems in so far as energetic systems require entropy to sustain their metastability. In the simplest of energetic systems, the Idea of heat death is reflected. As with all entropic phenomena, humans are implicated on a microcosmic level with that which occurs at the macrocosmic. Actions and thoughts will not just have already been extinguished by heat death. They, like all entropic phenomena, function with a degree of energetic freedom that carries with it the concept of responsibility as Jonas likewise argued.

While at a general level, within the great envelope of the timeline of the universe, there is no hope for an eternal return, at the level of the everyday even the smallest of energetic transformations has import and is connected to the end. The cosmotheoretical and cosmoethical crisis that thermodynamics initiated in the nineteenth century when it declared that time was linear and irreversible not only has meaning for the moment it no longer matters. This is what is fundamentally at fault in Brassier's speculative extinctionism. The importance of the Idea of heat death is that it furnishes the present theoretical means with which to understand man's place within the greater ecological and cosmic whole. Yes, the sun will die. There will be a solar catastrophe. But it is the very dissipative dying of the sun that, through the photosynthetic marvel performed by plants, life and the theoretical and ethical problems attached to it are at all possible. We will not just be rendered extinct by the death of the universe; we are, in an existential sense, this very dying. If, for stoicism, the city-state reflected the cyclical rebirth of the cosmos, then for thermodynamic architectonics, the earth must be understood as a reflection of the entropic irreversibility of heat death. Only through such a cosmoethical thought "the soul's habitation can henceforth be safely built."

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