

A First Cause and the Causal Principle: How the Principle Binds Theology to Science

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This paper proposes that science and theology are related logically in virtue of a true causal principle: This principle is both integral to inferring a First Cause and presupposed by scientific inquiry. Though it is generally agreed that the inquiry presupposes the principle, it is novel to say that the causal principle is certifiably true and can be used to strictly imply a First Cause. Also, there is attention to how this Cause, as a God of Nature, relates natural science to ethics with no naturalistic fallacy.¹ Given that this fallacy has divorced modern ethics from human nature and has induced ideologies which still seek to reshape it, with pathological consequences, there is more at stake than might be supposed. Key to the discussion is an idea in modal logic of ‘strict implication’.

On the one hand, a statement p can be said to *imply* a statement q in terms of the material conditional ‘ $p \rightarrow q$ ’, where \rightarrow reads ‘if...then’, if and only if q is not in fact false when p is in fact true. On the other, p can be said to *entail* q in terms of ‘ $p \vdash q$ ’, where \vdash denotes a valid inference, if and only if q being false when p is true is logically impossible. This impossibility means that ‘ $p \vdash q$ ’ is necessarily true since q follows logically from p . In this way ‘*strict implication*’ is an idea in modal logic that marks a boundary between implication and entailment. There are cases in which q is not entailed by p but, nonetheless, in which $p \rightarrow q$ is too weak epistemologically to capture the relationship. For example, the material conditional ‘If John chews gum, then he’ll blow bubbles’ permits a reasonable possibility that John did not in fact blow bubbles when he chewed gum. But a modal conditional holds that it is *impossible* that q is false ($\sim q$) when p is true. There are modal conditionals such as ‘If John was conceived, then there were prior biological processes’. Given our reproductive nature, it is either irrational or *more*

¹ The Naturalistic Fallacy holds that it is fallacious to infer what *ought* to be from what *is* the case. In the context at hand it specifies that scientific descriptions of human nature can not be used to infer prescriptions in regard to fulfilling our nature when there is not Nature’s God. [As a postscript to this article, consider Professor Ralph McInerney’s insight: “It is not too much to say that 20th century English speaking moral philosophy was dominated by the fact/value split... avoidance of any suggestion that evaluations were grounded in truths about ourselves and the world.” Since the world was related to values by Nature’s God from Aristotle to Thomas, a relationship anachronistically skewed by modern secular philosophers, to say Thomas’ “views are countercultural is an understatement.” See “Introduction to Thomas Aquinas,” Int. C. Univ., <http://icu.catholicity.com>.]

than unreasonable to admit of a possibility that there were not the processes when he was conceived. That is, while his being conceived is logically possible when the processes do not occur, it is physically impossible. This sort of impossibility can be recast as a necessity in which p is said to *strictly imply* q if and only if ' $p \rightarrow q$ ' is necessarily true without being trivial. The nontrivial necessity 'Necessarily if p , then q ' is typically expressed as $N(p \rightarrow q)$ or $\Box(p \rightarrow q)$.

Having noted a nature of modal reasoning, consider Thomas' Second Way. This argument for God begins with an experienced world:

In the world of sense we find there is an order of efficient causes... Now in efficient causes it is not possible to go on to infinity... if there be no first cause among efficient causes, there will be no ultimate, nor any intermediate cause... which is plainly false. Therefore it is necessary to admit a first efficient cause, to which everyone gives the name God.²

The argument's form is: 'If there is no uncaused First Cause, there are no second causes; there are these causes; so there is a First Cause'.³ Importantly, this Cause has no corporeal nature that requires a cause. As omnipotent and voluntary, the Cause is *analogous* to persons as limited first causes. The latter include our intellect and free will for which our bodies, as natural causes, are necessary conditions. In being composed of natural and voluntary causes, persons are second causes whose existence depends causally on other dependent second causes. Equally significant is that Kant gave 'critical expression' to the causal principle by admitting of only natural causes. But his relegation of free will to a *noumenon* bifurcated inquiries of ethics from science. And since scientific truth presupposed a causal principle that he relegated to a metaphysics which was not known to be true, truth in science was effectively undercut as well.

Having made these points, let $\sim F$ denote 'There is no First Cause' and $\sim S$ that 'There are no second causes'. The material conditional $\sim F \rightarrow \sim S$ is true if *as a*

² St. Thomas Aquinas, *Summa Theologica*, I, 2, 3. From *A Summa of the Summa*, Ed. by Peter Kreeft, (San Francisco: Ignatius Press, 1990), pp. 66, 67. Here, let me add that one may challenge the identification of a First Cause, of natural theology, with a supernatural God. This God tells Moses "I AM THAT I AM." Since the time of St. Augustine, there has been no challenge to the words meaning that God is ultimate Reality as well as that everything *depends* on Him and He on nothing. He says to Job "Where were you when I laid the earth's foundation? [38:4]... When I made the clouds its garment [38:9]... Do you know the laws of the heavens? [38:33]." In Jeremiah God says "Do not I fill heaven and earth? [23:24]" Even if one does not believe in the Bible, the references relate the Bible to a First Cause. In Thomas' proofs, *this* Cause does not depend on a cause because it is a purely voluntary Cause *qua* normative Wisdom which explains a morally relevant reasoning from factual matters. Attention to these matters is manifest in a theological concept of 'unconscionable' used by judicial systems, from America to international war crimes tribunals, due to evident inadequacies of secular ethics (of which both Wittgenstein, who expressed 'awe' of St. Augustine, and Augustine were suspicious).

³ See Kreeft's reference to a *modus tollens*, less the modality, in *A Summa of the Summa*, p. 67, n.22.

matter of fact it is not the case that $\sim F$ is true when $\sim S$ is false. Given a factual or empirically contingent nature of the conditional, it is logically possible that S when $\sim F$. But when Thomas states that in the “causes it is not possible to go on to infinity” and that “it is necessary” to admit of a first cause, he suggests that $\sim S$ must be inferred from $\sim F$: *It is impossible that S when $\sim F$* . Therefore, $\sim F \rightarrow \sim S$ is true necessarily and can be understood as ‘*Necessarily $\sim F \rightarrow \sim S$* ’. Its truth is not contingent because of the necessity and the necessity is not logical since $\sim S$ and $\sim F$ have different meanings. Is the conditional merely metaphysical? An alternative to metaphysics that explicitly employs a nonmetaphysical ‘necessary truth’ is noted after another popular alternative, which seems less satisfactory, that seeks to bypass the anomalous ‘truth’ by appealing to possible worlds.

1. Do Possible Worlds Avoid a Nontrivial Necessary Truth?

An anomalous ‘necessary truth’, whose denial is logically possible, might be avoided by construing the modal operator ‘possible’ as a quantifier over possible worlds, where the idea of a *world* is primitive. Though a proposition p may seem necessarily true, at least physically in our world, a world is imagined where $\sim p$ is true because it is logically possible. ‘Possibly $\sim p$ ’ is expressed factually as ‘There is a world in which $\sim p$ ’ in order to evaluate if this negation is deniable in our world without an odd impossibility that is recast as the peculiar necessity. In this sense there is a version of the Lewis Conditional in modal logic.⁴ The nontrivial necessity ‘*Necessarily if ϕ , then Ψ* ’ is rendered ‘*If ϕ , then Ψ* ’ in which it is true that ‘*There is a world in which ϕ* ’, where Greek letters are variables for formulas of propositional logic. Then, we consider if Ψ would also be true in our world. But our world is kept as unchanged as possible by excluding unnecessarily bizarre ways that ϕ is true. Putatively, truth conditions exclude vacuous truth since not all practically, physically, or logically possible worlds are imagined but only those most like our own in which the antecedent is true.

Consider ‘If there are no causes, there are no events’ where *events* include classical phenomena at single points in spacetime, a wider spacetime related to vacuum fluctuation models in quantum physics to explain an emerging universe, or fundamental observational entities in relativistic physics. Given a false antecedent for practically possible worlds most like our own, we weigh more remote worlds. Since it seems even physically impossible, we consider logically possible worlds. In such a world (w) most like our own that is otherwise unchanged, we ask: Can

⁴ See a version of the Lewis Conditional in John Nolt’s *Logics* (London: Int. Thomson Publishing, 1997), pp. 351-356. I am grateful to Professor Nolt for his informal correspondence in regard to ‘If $\sim F$, then $\sim S$ ’. Below, see my proposed solution of using its contraposit to ameliorate an anomaly.

events arise from nothing in our world? Given that the answer is *no* and that there are *no* causes, the conditional is true. Thus to affirm that there are events is, by a *modus tollens*, to affirm that there are causes. This illustrates the more general understanding: ‘If ϕ , then Ψ ’ is true if and only if Ψ is true when ϕ is true among all worlds at least as possible relative to our world as w .

Now, given that second causes in our world include everyday objects, consider that understanding, in terms of two clauses, for there being no first cause: ‘If there is no first cause, there are no second causes’ is true if and only if: 1. There is a world w where there is no first cause, and 2. There is no world, at least as possible relative to our world as w , where there is no first cause but there are second causes. Surely, it is *logically possible* that world w has no first cause. Modern denials of this cause refer precisely to that remote possibility. Therefore, clause 1 is satisfied. And in imagining our world to be the same except for there being no first cause, we reflect on if there would be second causes in our world. Quaint thoughts might cross our minds. Typically, if a child said that a cookie came from nowhere or nothing, a mother would laugh and say ‘That’s impossible’. Our common experience indicates that it is not *practically* or *physically possible* for anything, including a series of causes, to cause itself or come from nothing. Hence, there would be no second causes and clause 2 is satisfied. And thus the conditional is true that if there is no first cause ($\sim F$), there are no second causes ($\sim S$). But since S obtains, there is the following sequent where $\Box \rightarrow$ reads “if...then” and \vdash refers to a valid inference: $\sim F \Box \rightarrow \sim S, S \vdash F$.

On the one hand, Thomas would presumably reject a world w in clause 1 where there is no first cause.⁵ This problem stems from truth conditions that exclude vacuous truth. Truth conditions that permit it would eliminate the clause by allowing for the conditional’s truth even if there is no possible world without a first cause. In terms of such a semantics, however, the proof would become a kind of trivial inference from the necessary existence of a first cause of all possible worlds. On the other hand, the proof is still sound because if both clauses hold and there is a second cause in the actual world, then there must be a first cause in our world as well. Is there an approach that might exclude, at least practically and physically, unnecessarily remote worlds which have no first cause? What about using the contraposit $S \Box \rightarrow F$?

This conditional $S \Box \rightarrow F$ is not inferable from $\sim F \Box \rightarrow \sim S$ because of counter instances. For instance, the conditional ‘*If the Atlantic is an ocean, it is a polluted ocean*’ is not inferable from ‘*If the Atlantic is not a polluted ocean, then it is not an ocean*’. In the first conditional, the Atlantic is already an ocean in the actual world. Therefore, the antecedent is true. And the consequent is also true

⁵ Nolt, correspondence. Cf. *Logics*, p. 355, for an inability to use a contraposit as noted below.

among all members of this one-member class of worlds. And thus this conditional is true in the actual world as well. But the second conditional's antecedent, 'the Atlantic is not a polluted ocean', is not true in our world. Accordingly, worlds are imagined that are most possible relative to our world where there is not the pollution. The pollution might not have occurred because, say, there was no industrial revolution. Notwithstanding this possibility, the consequent is false that 'the Atlantic ocean is not an ocean'.

But although $S \Box \rightarrow F$ is not inferable from $\sim F \Box \rightarrow \sim S$, a proof can still use a contraposit *per se* that is not inferred. The following clauses hold for 'If there are second causes, there is a first cause': 1. There is a world w where there are second causes, and 2. There is no world, as possible relative to our world as w , where there are second causes but no first cause. Clause 1 is already true of the actual world and this world is unchanged in clause 2 in which there is a first cause. There is this cause since, as for events that beg for causes, there is no physical possibility that second causes cause themselves. And if a 'first cause' was caused and that cause caused ad infinitum, a second-cause totality would be uncaused. Thus there is a sound proof with no remote anomalous world w without a first cause: $S \Box \rightarrow F, S \vdash F$. This sequent, in point of fact, more clearly captures a Thomistic *theology of science* because any uncaused world w could materialize out of nothing and would not be subject to scientific inquiry.

2. An Alternative Idea of Modal Truth in Thomas' Proof

A problem with a modal logic of possible worlds is that, besides a notion of 'world' being questionably basic since it implicitly retains 'possibility'—possible worlds, modalities seem to surface also in evaluating a truth of the consequent. An alternative consistent with Thomas' language explicitly admits of words such as 'not possible'. Thus although S when $\sim F$ is logically possible, it is patently not possible in light of the nature of experienced things. Can the impossibility be recast more straightforwardly by 'Necessarily if $\sim F$, then $\sim S$ '? Given that S , the necessity read ' \Box ', and the definition $\Box(\sim F \rightarrow \sim S) =_{df} (\sim F \Rightarrow \sim S)$, there is the evidently sound sequent $\sim F \Rightarrow \sim S, S \vdash F$. Its soundness will center on a truth of $\sim F \Rightarrow \sim S$. To say it is modally true is to say that it has a denial which, though conceivable, is not believable. An objection that the disbelief begs for other premises may be assuaged by a *reductio ad absurdum*.

To assert S when $\sim F$ is to deny a causal principle that 'It is physically impossible that there is an event (phenomenon) when there is no cause'. Recast as a necessity there is 'Necessarily if there's no cause, there's no event.' Absurdly, its denial admits of a cosmic series, which is a phenomenon, that either caused

itself or came from nothing. It would not only be unlike all the phenomena of which it is composed but not be subject to scientific inquiry. And these points are not obviated by Quentin Smith who states that “Since definitions of causality often make explicit or implicit *reference* to laws, it is natural to suppose that, if there is only one completely lawless thing [a big-bang singularity], this thing will also be the only thing exempt from causality.”⁶

However, laws *refer* to a causal principle but not the principle to the laws. The laws both arise by a scientific inquiry that presupposes the principle, since otherwise the inquiry would usurp itself by admitting of events that occur for no reason, and presuppose causal regularities for coordinating predicted states of a physical system to the system’s present state. At the same time, the principle does not imply a given law. And while there are no lawful ‘states’ of a big-bang singularity that are known because it is devoid of anything subject to *current* theories,⁷ the singularity is a phenomenon of energy (E) correlated to a mass of the universe (m) by Einstein’s physics ($E = mc^2$). This fact in itself renders inclusive the domain of scientific inquiry to its study. Thus although it is logically possible that the singularity is not subject to scientific inquiry, this possibility is not reasonable to suppose. And future inquiries, which are not reasonable to abandon, *presuppose* a physical impossibility that it caused itself or came from nothing. The presupposition is not a ‘metaphysical truth’, defended intuitively as Smith suggests,⁸ but rather what may be called a ‘modal truth’. And thus a tenable notion of this ‘truth’ is at stake.

There is important insight on the truth by Wittgenstein. Sometimes, doubt is patently unreasonable. In a court of law, for instance, circumstances tend to give statements a reasonable probability. But the statement that “someone came into the world without parents [in the absence of medical technology] wouldn’t ever be taken into consideration.”⁹ Accordingly, it would be fruitful to consider a claim that someone came into the world without parents. What can Wittgenstein mean other than there are no facts which would overcome doubt? Though the assertion

⁶ Quentin Smith, “Can Everything Come to Be Without a Cause?,” *Dialogue: Canadian Philosophical Review* 33 (1994) p. 6, emphasis, at <http://atheism.about.com/gi/dynamic/offsite.htm>.

⁷ *Current* theories beg for pessimistic inductions: An inductively reasonable pessimism about the unqualified truth of a major theory warrants a pessimism about its arrant applicability since every past major theory was superseded by one which addressed properties of phenomena that had not been acknowledged. Cf. W.H. Newton-Smith, *The Rationality of Science* (London: Routledge, 1981), p. 14.

⁸ Smith, “Can Everything Come to Be Without a Cause?,” p. 3. He says a defender of the proof may say it is “logically possible for everything to come to be without a cause... but it is... (metaphysically) impossible.” His parenthetical reference to metaphysics suggests that the defender would hold that the denial of a First Cause is ‘metaphysically false’ and that the affirmation is ‘metaphysically true’.

⁹ Ludwig Wittgenstein, *On Certainty*, ed. G.E.M. Anscombe and G.H. Von Wright (NY: Harper-collins, 1986), p. 42e, #335 for the first quote and p. 59e, #454 for the second quote.

is *more* doubtful than an ordinary empirical claim that is false, such as one that posits an incorrect year of birth, it is not logically impossible. “There are cases where doubt is unreasonable, but others where it seems logically impossible. And there seems to be no clear boundary between them.”

The boundary between a doubt that is logically impossible and a doubt that is empirically unreasonable bears on a certainty that, while not logically unassailable, is more reasonable than empirically contingent truths that do not count against it. This point seems to capture a nature of modal truth. Indeed, in the positivist tradition of which Wittgenstein was an icon, there would be a middle ground between logically certain *analytic* truth and a truth whose denial, in being physically possible, is *synthetic*. Since the words ‘synthetic’ and ‘analytic’ are rooted in Kant, there needs to be further consideration of what might lie between logical impossibility and empirical falsity in the Kantian tradition. In questioning this tradition, W. H. Walsh notes a middle ground of categorial mistakes.¹⁰ They may be illustrated by a quarter which is dropped. A mistake of supposing that the quarter vanished by going out of existence lies between a ‘material mistake’ of saying it rolled left when in fact it rolled right and a logically impossible ‘formal mistake’ of holding that it rolled both right and left. Categorial mistakes resemble ones that are modal. Modally, it is necessarily true and less than reasonable to deny that either ‘If X ceases to appear, X did not go clean out of existence’ or ‘If X exists, X did not come from nothing’.

Admittedly, in terms modern language, it may seem odd that X would be a second cause and that causes are both natural and voluntary. Though voluntary causes are ignored in psychology when persons are construed deterministically, they render coherent ‘truth’. The truth claims p and $\sim p$ would be equally true because equally determined if persons were not limitedly *free from* a deterministic realm that is more proper to a methodology of physics.¹¹ However, physics is also encompassed by the conditional since physical systems are as causally dependent as those of biology and psychology. Psychobiological systems may have evolved from biophysical systems, they from physical systems, these from a black hole, and even the hole from a previously collapsed universe and so on in terms of an astrophysical theory. But the series still begs modally for a cause that is not dependent. And although dependent phenomena are studied by sciences that make no immediate reference to an uncaused cause, the cause is *as* related logically to science as a causal principle. The principle and cause are inapplicable

¹⁰ W. H. Walsh, *Metaphysics* (Hants, UK: Ashgate Publishing Co., 1991), pp. 154-58.

¹¹ Natural causes alone were accepted when the causal principle was given a so-called ‘critical expression’ by Hume and Kant. Subsequently, however, their *philosophical* determinism was distinguished from a *methodological* one in terms of which free choice of will was ignored but not denied for the limited purposes of various inquiries in the natural sciences such as those of physics.

to the series only if the series is not subject to scientific inquiry.

Scientific inquiry presupposes that phenomena are caused. And the absence of an uncaused first cause admits of an uncaused series that is itself a phenomenon. It is *logically* possible that this phenomenon has no first cause. But its lack is as *physically* impossible as the phenomenon coming from nothing: Necessarily if there is not the cause, there is not the phenomenon. And the latter is ‘creation’. Thus, debates over Creationism amount to a *straw man* if they presume that a Creator must conform literally to Scripture or that Scripture, being theology *in toto*, is unrelated to science. Science and natural theology may be related modally. How could modalities of science and Thomas’ conditional *not* have a stronger truth than empirically contingent truths that do not count against them? It is untenable to ascribe ‘truth’ to possibly false claims and not to modalities whose denials are, *via* Walsh and Wittgenstein, more seriously mistaken than the denials of contingent truths that are merely reasonable. And while no evidence tends to count against the modalities in seeming violation of a verification principle, they are not senseless in the sense of a speculative metaphysics that has no perennial touchstone in experience.¹² Beyond experience, Thomas’ conditional may be inferred from various principles of science.

3. A Modal Relationship of Medieval Theology and Modern Science

Science may itself fortify $\sim F \Rightarrow \sim S$. To accept that S (There are second causes) is to accept they cannot occur, aside from a first cause, when there are no prior second causes. Hence, given their modal nature, S is replaceable by ‘ S_m ’ to denote physical impossibilities: ‘There are machines that *cannot* work perpetually when there is no perpetual energy’, for a thermodynamic law in physics;¹³ ‘There are metamorphic rocks that *cannot* be formed when rock masses do not undergo great pressure’, in geophysics; ‘There are bacterial mutations that *cannot* be averted when antibiotic drugs are administered’, in medicine;¹⁴ and ‘There are persons who *cannot* come into the world when there are no reproductive causes such as unions of male and female gametes’, or ‘Necessarily if there are no gametic unions or other causes, persons do not come into the world’.

To assert S_m when $\sim F$ is to assert a truth of the truth claims about the causes when there is no first cause. Absurdly, however, a necessary condition for

¹² A verification principle that a sentence is meaningful *iff* evidence can count against it is self-refuting, when applied with no caveat, since no evidence counts against the principle..

¹³ Cf. M. Yavorsky and Y. Seleznev, *Physics* (Moscow: MIR Publishers, 1979), p. 165. That is, “a *perpetual motion machine of the first kind is impossible*.” Is the *impossibility* a logical one?

¹⁴ See L. Garrett, “Drugs Barely Keep Ahead,” *Newsday Ky. Enq.* 13 March 1995, No. 338.

the assertion is a person who would be part of a causal series that could cause itself or come from nothing. In one claim, a phenomenon of persons coming into the world *cannot* occur when there are no causes but the causal series, that is also a phenomenon, *can* come from nothing. Moreover, to deny that $\sim S_m$ cannot be false when $\sim F$ is true is to deny that $\sim F \Rightarrow \sim S_m$ cannot *itself* be false when S_m is true. That is, $\sim F \Rightarrow \sim S_m$ is equivalent to $S_m \Rightarrow (\sim F \Rightarrow \sim S_m)$.¹⁵ In effect, the latter expresses: *'It is necessarily the case that since S_m denotes truth claims that are part of the second cause series, S_m cannot obtain when $\sim F$ '.*

In order to further appreciate these points about S_m , we need to recall that our bodies as natural causes are necessary conditions for voluntary causes. Since the latter include our free will, thought, and truth claims, the claims of S_m are included among second causes (*Summa* I, 77, 8 and 83, 1). In short, $\sim F \Rightarrow \sim S_m$ cannot be false when S_m is true. And its truth, having a denial that is physically impossible, is more epistemologically secure than an accepted truth of well established scientific laws. Though the logic may seem overly abstract, it amounts to a minimal rigor for a response to many post-Kantian philosophers who, influenced by a verification principle, would reject modalities because they resemble metaphysics. A quaint objection of this anti-metaphysical community is revealed by a received view of the First Cause Argument:

This argument is often criticized by questioning its ASSUMPTION that an infinite series is impossible... the ancient Greeks, for whom the notion of infinity was *unthinkable*, found this assumption plausible; but we now are able to think about infinity, and need not accept it.¹⁶

Clearly, the *thinkable* is a modern idea that an infinite regress is logically possible. This possibility is imposed anachronistically on the Greeks who, ironically,

¹⁵ To avoid technicalities in the text, some other points are noted here. Though truth tables are not applicable to modalities that are not truth-functional, the tables reveal some points about the evident equivalence:

Row Below:	$S_m \Rightarrow (\sim F \Rightarrow \sim S_m)$	Row Below:	$\sim F \Rightarrow \sim S_m$
1.	t T ft T ft	1.	f T f
2.	t F tf F ft	2.	t F f
3.	f T ft T tf	3.	f T t
4.	f T tf T tf	4.	t T t

The tables raise a question: Would not logically possible truth values include values that are modal? In Rows 2, $\sim F \Rightarrow \sim S_m$ is false when S_m is true and $\sim S_m$ is false when $\sim F$ is true (whose contraposit is F is false when S_m is true). But these violate a causal dependence, presupposed by science, that scientists cannot coherently accept. And since there are the unacceptable falsities of S_m in rows 3 and 4, an assent to rows 1 is patent: $\sim F \Rightarrow \sim S_m$ is true when S_m is true. Modally, $\sim F \Rightarrow \sim S_m$ cannot be false when S_m is true. And $\sim S_m$ is false when $\sim F$ is false. Its contraposit is F is true when S_m is true. Modally, F cannot be false when S_m is true: $S_m \Rightarrow F$. And consequently, not either F or $S_m \Rightarrow F$ can be false when S_m is true.

¹⁶ See Robert Martin, *The Philosopher's Dictionary* (Lewiston, NY: Broadview Press, 1996), pp. 88, 89, for this received view of the argument. Emphasis added.

include Aristotle who used modal logic (e.g. *Posterior Analytics* 73^a). The impossibility is not logical but modal. If there is no modal truth, what is the epistemic status of sentences such as ‘It’s impossible that persons come into the world when there are not prior biological processes’? Though this sentence is not empirically true in a modern sense, there is a sense in which it is modally true. Insofar as scientists admit that phenomena can begin to exist only by what already exists, they ultimately acknowledge the existence of a First Cause. A modern idea that this Cause *qua* Nature’s God is not inferable from the phenomenal world is largely rooted in Kant. Peculiarly, he seems to have influenced a virtual world view of many secular philosophers. Were philosophy as well as science skewed by dogmas of early modern revolutions?

4. The Scientific Revolution Behind Kant

Why were modalities that were true mistaken for a truthless metaphysics? In addition to the scientific revolution that began with Copernicus and influenced a ‘Copernican Revolution’ of Kant, the Enlightenment construed science as ideal knowledge. Echoed in d’Holback’s *System de la Nature* (1770), science would resolve all earthly problems and make us happy. But Wittgenstein and Heidegger were troubled ‘metaphysically’ by why there is ‘something’ rather than nothing. A sense of *nothingness* and an *angst* over a world with no *a priori* meaning ensued from there being no uncaused Creator.¹⁷ And the theology of a Creator seems to have actually benefited science. In “How a Scientific Discovery is Made,” Harvard physicist Gerald Holton notes that scientists have been perennially influenced by theology. The theological influence holds right up to J. G. Bednorz and K. A. Müller, who won the Nobel Prize for superconductor developments, even if this fact “rarely survives in the published record.”¹⁸

It is beyond my purpose to delve deeply into problems that, beyond the published record, arise by ignoring the modal reasoning. Suffice it to say that the reasoning conflicts with an infrastructure of modern philosophy that comprises a “positivistic-empiricistic-scientific-secularworld view.”¹⁹ Despite a fixation on science as ideal knowledge, this world view strictly excludes both ascriptions of “truth” to scientific theories and reasoning from them to what can be inferred for the good of human nature. Hume’s Naturalistic Fallacy has become a virtual

¹⁷ See Martin Heidegger, *An Introduction to Metaphysics*, tr. R. Manheim (NY: Doubleday, 1961) p. 3, and Norman Malcolm, *Ludwig Wittgenstein: A Memoir* (NY: Oxford University Press, 1984), p. 59.

¹⁸ Gerald Holton, H. Chang, and E. Jurkowitz, “How a Scientific Discovery is Made,” *American Scientist* – *Sigma Xi Scientific Research Society* 84 (1996) 354.

¹⁹ Kreeft, *A Summa of the Summa*, pp. 139-140, n. 118.

truism for excluding inferences from what *is*, to what *ought* to be the case. That is, modern philosophy tends to hold that what is scientifically true about our nature does not reflect a nature that *is* as it *ought* to be because there is no God of Nature. This point bears on why science was senselessly divorced from ethics and theology in the Humean-Kantian tradition. Moreover, and ironically, this tradition begot knotty epistemological problems for science itself.

Since science was taken as ideal knowledge, it was a foregone conclusion that knowledge in ethics and politics would be even more problematic. For instance, how can ‘truth’ be yielded by scientific inquiries when they presuppose a causal principle that is not known to be true? In terms of a K-K Thesis, the question arose of how we ‘Know we Know’.²⁰ Knowledge in science would presuppose a principle that has no known truth since it is merely metaphysical. Metaphysics in the Kantian tradition refers to judgements that are *synthetic a priori*. In being *a priori*, they are assumed prior to experience and are not known to be empirically true. And in being *synthetic*, their having different subject and predicate concepts means that they are not logically true. In not being true logically or empirically, the judgments were held to be metaphysical. Generally, metaphysics came to be viewed as being either meaningless or senseless.

This brings us back to a metaphysics of the causal principle. While ‘Some events are caused’ is known *a posteriori*, ‘All events are caused’ is *synthetic* and presupposed *a priori* for a coherent scientific inquiry. Thus truth claims afforded by the inquiry are usurped by the presupposed principle, that is not known to be true, as surely as the claim ‘The door is open’ is undercut by not knowing if there is a door. Even apart from presuppositions, restrictions to empirical and logically necessary truth exclude a known truth of scientific theories.

Hypothetically, ‘truth’ might be ascribed to theories if they are taken as conjunctive propositions whose conjuncts are laws. For instance, the three laws (L) of Newton’s theory (T) might be formulated as $L_1 \wedge L_2 \wedge L_3$, where \wedge denotes ‘and’, to which as a proposition ‘truth’ can be ascribed. The material conditional $T \rightarrow P$ is currently stressed. While the truth of a prediction P does not imply the truth of a theory T , a false prediction $\sim P$ does imply $\sim T$: If there is any knowledge at all, strictly speaking, it is merely of false theories and laws — notwithstanding a probabilistic Popperian truth-likeness (verisimilitude). Yet laws are universal as well as composed of theoretical terms, say ‘mass’ in contrast to ‘weight’, with no

²⁰ The K-K Thesis: “if skepticism is to be avoided, the exploitation of... ‘causal’ regularities in obtaining a posteriori knowledge must not require prior knowledge of those regularities, for... it would be impossible to obtain our ‘first’ pieces of knowledge about the physical world.” See F. Suppe, ed., *The Structure of Scientific Theories* (University of Illinois Press, 1979), p. 722. Inductive logics, given the critiques of Hume and Kant, are irrelevant to securing the “putative knowledge claims [726, 727].” That the Thesis has not been solved by philosophers who mistake modalities for metaphysics is no surprise, given that “Good philosophy of science must come squarely into contact with... metaphysics [728].”

immediate reference to reality. An experienced reality excludes inductions to both theoretical constructs and universal empirical truths. And an appeal to predictions for exploiting an implicative reasoning, as it turns out, no more imply false than true theories. Theories are applied *a priori* and it is logically possible that false predictions involve anomalous domains—say one prior to relativistic physics in which phenomena approach the speed of light. At the same time, in not being logically true, theories would be *synthetic*. They would be *synthetic a priori* and, in effect, metaphysical. These sorts of dilemmas fostered relativism.

5. How Kant's Critique of Reason Begot an Irrational Relativism

Relativism arose largely because Kant's revolutionary *Critique of Pure Reason* limited 'truth' to the *analytic* and *a posteriori*. The limitation begot the material conditional which admitted only of logically possible truth values. Also, he sought to rationalize judgments such as 'cause and effect' by mental categories imposed *a priori* on the world. But the world's interpretation in terms of his categories of mind, common to the human race, opened Pandora's Box. Responding to Hume's criticism of knowledge being *a priori* by situating the *a priori* in our mind, his thesis that the mind has *a priori* categories was itself metaphysical: 'Mind' and 'categories' are different concepts, making his thesis *synthetic*. And this synthesis was assumed *a priori* to explain the judgments. But although traditional metaphysical judgments were abandoned, Kant's idea of 'interpretation' was retained paradoxically for metaphysical accounts of 'truth'.

However, who gets to interpret truth *a priori*? Since there was no objective truth, its pursuit was replaced by quests for power to determine it. And this was most effectively achieved by politics. Thus there arose political interpretations of different, races, genders, and cultures wherein what is true for one group can be false for another. Women's Studies professors Daphne Patai and Noretta Koertge note that a politicized relativism took effect by the 1990s since a "bedrock of the current wave of feminism is the claim that gender itself is socially constructed, and that the different roles played by men and women... vary dramatically from culture to culture."²¹ Lest anyone miss the point of a cultural relativism, they add emphatically that on this view gender differences "can be neither explained nor justified by... innate biological sex differences."

A neglect of sexual differences between men and women was inspired by epistemic relativisms such as those of Thomas Kuhn and Paul Feyerabend whose

²¹ For this quote and the next, see Daphne Patai and Noretta Koertge, *Professing Feminism* (NY: Basic Books, 1994), p. 138. Patai is Professor of both Women's Studies and Brazilian Literature at the University of Massachusetts. Koertge is Professor of the History and Philosophy of Science and Adjunct Professor of Women's Studies at the University of Indiana.

relativistic ‘*Weltanschauungen* analyses’ were criticized euphemistically as neo-Kantian pragmatic views, less Kant’s categories for *Weltanschauungen* (world views).²² The relativism is either trivial or incoherent in terms of a sentence *S*. For *S* can be true in θ and false in Ψ , where ‘ θ ’ and ‘ Ψ ’ refer to world views of different races, genders, or cultures to which ‘truth’ is relative.²³ Given that the truth conditions are not the groups but a reality that *is* as it *is* apart from their will or thought, it is incoherent for *S* to be true in θ and false in Ψ since there is the same reality for what makes *S* false or true. And given that the truth value of *S* is determined by the groups, the relativism is trivial since the value is assigned by people who are themselves truth conditions. A way to avoid the conditions, in which favored groups are virtual incarnations of truth, is by an equally totalitarian view that the groups may *reshape* human nature.

Changing our nature as if one were God would afford new truth conditions for ‘truth’. Predictably, it was alleged that human nature had been molded to fit a ‘truth’ of males. Thus, some philosophers encouraged a pursuit of political power in order to reshape our nature to render false that ‘truth’. For example, Kathryn Parsons put a novel spin on the naturalistic fallacy by holding that since science is *in fact* dominated by male views, women *ought* to reshape it “unscientifically.”²⁴ Contrary to perennial scientific findings in which a greater psychic aggressiveness of men was rooted biologically in their sex drive or hormones, for instance, male children might be molded to be docile and women to be psychologically aggressive (where aggressive women and sensitive men are to be modeled, with a relativism of Thomas Kuhn in mind, on a politico-scientific paradigm).²⁵

6. Modal Realism for a Marriage of Science to Theology

Having noted a *reductio* for relativism, it needs to be said that its absurdity does not establish a realism for objective truth in science. There is a problem of scientific knowledge, much more of relating it to knowledge in ethics and politics, when scientific inquiry involves a dubious implicative reasoning and presupposes a problematic causal principle. Before reiterating how the principle’s truth may be defended, consider a renewed understanding of scientific inquiry.

²² Suppe, *Structure of Scientific Theories*, pp. 126, 127, fn. 258.

²³ Cf. W. H. Newton-Smith, *The Rationality of Science*, p. 35.

²⁴ See K. Parsons, “Nietzsche and Moral Change,” *Nietzsche*, ed. R. C. Solomon (NY: Doubleday, 1993), pp. 175, 186, in which a God of Nature and naturalistic ethics are rejected, if not ridiculed, in favor of an ethical relativism that is inspired by the ‘relativistic paradigms’ of Thomas Kuhn.

²⁵ Despite Parsons’ feminist spin on Kuhn’s ‘paradigms’, her deference to Nietzsche brings to mind Leon Trotsky’s idea of creating “a higher biological superman.” See Trotsky’s “Socialism and the Human Future,” *Marxism and Spirituality*, ed. B. Page (CT: Greenwood Publishing, 1993), pp. 258-260.

The inquiry can be said to yield truth in terms of epistemic modalities. One can say ‘A scientific theory cannot be false when it systematically predicts phenomena in a given domain’. Or ‘Necessarily if a domain of phenomena is predicted systematically by a theory (P), the theory is approximately true in the domain (T)’. That is, $P \Rightarrow T$, where it is impossible that $\sim T$ when P . How could a domain in which phenomena do not approach the speed of light and Planck’s constant is small, for example, *not be* reflected with approximate truth by Newton’s theory when that theory is systematically successful in its application to phenomena? Unless phenomena were reflected truly by the theory, how could it manipulate and predict the phenomena? To admit that phenomena cannot be predicted and manipulated when they are not reflected truly by theories is to admit of a realism in which reality is the truth condition for ‘truth’.

But does truth yielded by scientific inquiry presuppose a causal principle whose truth is not known? This dilemma arose with the material conditional ‘If there is no cause ($\sim C$), there is no event ($\sim E$), for $\sim C \rightarrow \sim E$: It is *logically* possible that E when $\sim C$. Modally, however, $\sim C$ is *physically* impossible: ‘Necessarily if $\sim C$, then $\sim E$ ’. And $\sim C \Rightarrow \sim E$ is stronger than an empirically contingent truth in virtue of being modal. A modal mistake of claiming a car stopped without a cause, for instance, would be considered more seriously false than a false empirical claim that it stopped since there was no gas (when it was due to a defective carburetor). This brings to mind W.H. Walsh. It is less seriously mistaken to claim that a quarter is not in my left pocket, when it is, than to claim that it materialized out of nothing or caused itself to be there. Given that it is not physically possible that things have no causes, the principle has an unusually strong truth whose denial is *more* than unreasonable. Hence, truths of scientific inquiry are not undercut by presupposing what is not known to be true.

In virtue of a true causal principle, science is related logically to theology since it is impossible that either a finite or infinite totality of second-cause events has no first cause. The reasoning is stronger than that of William Lane Craig (whose cosmological proof is still very important):²⁶ “The proper inference... is... ‘Whatever begins to exist has a cause’ and ‘The universe began to exist’ to ‘The

²⁶ William Craig, “The Caused Beginning of the Universe: A Response to Quentin Smith,” *British Journal for the Philosophy of Science* 44 (1993) p. 5. Also, Craig’s “The Ultimate Question of Origins: God and the Beginning of the Universe,” *Astrophysics and Space Science* 269-270 (1999) p. 13, has the universal premise “Whatever exists has a good reason for its existence...” The page numbers refer to the electronic versions at <http://www.leaderu.com/offices/billcraig/docs...> It needs to be said that Craig has contributed admirably to the proof, especially in response to objections based on quantum physics. I would add one thing about this physics in regard to the occasional objection that, since the physics is indeterministic, the causal principle is inapplicable. It *is* applicable since the physics is deterministic of probabilities. Hence, one might say that it is physically impossible for there to be an inexactly measurable event ($\sim E_i$) when there is no inexactly measurable cause ($\sim C_i$). That is, $\sim C_i \Rightarrow \sim E_i$.

universe has a cause', which is is a logically impeccable inference based on universal instantiation." While the instantiation yields a valid inference, however, the inference is not sound since it posits a universal proposition whose truth is not known *a posteriori* or logically. This dilemma contrasts to a logically possible falsity of $\sim F \Rightarrow \sim S$, where S implies F , that nonetheless is physically impossible. The impossibility is defended by a *reductio*. Absurdly, it would be physically possible that the universe came from nothing and is unlike all the other phenomena of scientific inquiry. But besides a *reductio*, the reasoning is further *strengthened* by an integration of truth in the moral and natural 'sciences'.

7. The Specter of Neils Bohr: A Correspondence to Morality

The case for modal 'truth' and a true causal principle for inferring a First Cause is fortified by an integration of the natural and moral 'sciences'. A concept of scientific 'truth', by analogy, was strengthened by Bohr's *correspondence principle* which rendered coherent a single world on which bore otherwise disparate theories; as the theories of quantum and classical physics may admit of overlapping 'worlds' by the equation $\lambda = h/p = h/mv$, where λ is a wavelength, h is Planck's constant, and $p = mv =$ magnitude of a moving particle's momentum (wherein a wavelength can be assigned to classical objects when they travel at *known* speeds relative to observers).²⁷ The analogy may seem weak because the equation has no normative components. But an analogy to the modal reasoning is strong in the sense that, besides the equation's truth not being usurped by a truth-valueless causal principle, the reasoning specifies that prescriptive components can be inherent in descriptive scientific concepts. These concepts may admit of a correspondence in terms of overlapping factual and moral components. In short, components of moral 'science' can be implicit in those of the social and natural sciences in virtue of inferring a First Cause from a true causal principle. And in being related logically to both natural science and theology, the principle does not result in Kant's divorce of *noumenal* and *phenomenal* worlds. Rather the principle bridges them for the coherence of a single world.

In sum, a correlation of modern science to ethical norms, which are certifiably true, fortifies a case for the modal reasoning. In terms of this reasoning, the natural sciences are related logically to the theology of a First Cause *qua* Nature's God. In virtue of this God, our nature is implicitly as it ought to be. Hence, how our nature should be fulfilled is inferable from findings of biology, psychology, and medicine. *Pari passu* these sciences afford true prescriptions.

²⁷ See, for example, comparative formulations in Yavorsky and Seleznev, *Physics*, pp. 53, 475, and R. Egerton's "De Broglie's Matter Waves," <http://laser.phys.ualberta.ca>

Viewed traditionally in terms of natural virtues, the prescriptions undergird politics since its end is to institutionalize our fulfillment. The fulfillment includes obtaining scientific truth about our nature for *nurturing* healthful fulfilling lifestyles. Ones that are healthful contrast to an aftermath of social pathologies. Since the 1960s in America which has been the international *role model*, the divorce rate exploded by over 200 per cent, teen suicide by 300 per cent, out-of-wedlock births by 500 per cent, violent crime by 500 per cent, and SAT scores plunged from 975 to 897.²⁸ The statistics are inextricably traced to ideological agenda such as a feminist support of no-fault divorce that fueled psychosocial disorders of children, rising juvenile crime, and extramarital sex with an epidemic of sexual diseases and out-of-wedlock births.²⁹ Given the pathologies inflicted by ideologies, there comes to mind Thomas' caution against assuming univocally that we are the same as God. Indeed, in seeking to be gods rather than in more humbly inferring an ethics from scientific descriptions of human nature, it is questionable whether we will create a better nature or a hell on earth.

One may object that the empirical consequences of conduct advocated by political ideology can be countered without the proof of a First Cause. But why has a ubiquitous *political correctness* not been countered?³⁰ Apart from the Cause, an ethics based on our nature will conflict with a modern ethics that defers to a naturalistic fallacy. Though the fallacy is not known to the public, the public is informed by academic institutions that have been shaped by the assumptions of modern philosophy for many generations. Therefore, generational change must

²⁸ Statistics presented on *PBS McLaughlin Group Report*, 26 Mar 1995, Washington DC 20036.

²⁹ See a plethora of literature that ranges from Linda Waite and Maggie Gallagher's *The Case for Marriage: Why Married People are Happier, Healthier, & Better Off Financially* (Doubleday, 2000) to M. Jellinek et al, "Use of the Pediatric Symptom Checklist to Screen for Psychosocial Problems in Pediatric Primary Care," *Archives of Pediatrics & Adolescent Medicine* 153, No. 3 (1999).

³⁰ A colleague, who taught race-gender studies, asked angrily at a faculty meeting "Will someone please tell me what 'political correctness' is?" Though no one answered since it was perfectly clear that the belligerent question amounted to a denial of its existence, let me now relate the 'correctness' to 'truth': When 'truth' is politicized (not that those studies need do this), there is a political correctness wherein what is 'correct' may be empirically false. Since false beliefs about empirical reality play no role in what is 'correct', what is 'correct' may vary in one culture at different times or at the same time in different cultures. Thus, there is an epistemic relativism. Larry Lauden recalls his colleagues who were persuaded that this relativism was an episodic cultural silliness which would "wither and die of its own accord." But more than a quarter century after the first salvos "hit the press, relativism... shows no signs of abating." Lest his remarks strike the reader as hyperbole, he quotes an official blurb of the Alfred Nobel Foundation; a Foundation, ironically, whose awards for scientific discoveries presuppose objective truth in science. The blurb states that science as an "objective endeavor is over..." We have begun to think of it as a "subjective and relativistic project, operating out of social attitudes and ideologies — Marxism and feminism, for example." These ideologies, while mutating into multiculturalism and postmodernism, continue to fuel political agenda and to challenge traditional theology in unprecedented ways that range from viewing belief in God as inconsistent with science to holding that Scripture is a chauvinistic myth. See Lauden, *Science and Relativism: Some Key Controversies in the Philosophy of Science* (University of Chicago Press, 1990), pp. viii, ix.

begin intellectually in the institutions. And a further cynical objection that these institutions will not change since there will be no change of heart of radical feminists, who will ignore arcane cosmological proofs, does itself ignore several facts. Ideological academics are not a majority. And the majority can respond effectively to those academics when they need not appeal to a truthless metaphysics that gave rise to ideology in the first place (in terms of questions such as ‘Whence comes “truth” if not from metaphysics?’ and answers such as ‘From dominating white males in a Eurocentric culture’). While it takes time for scholars to mull over esoteric proofs and their import, as it took a better part of the nineteenth century to draw the implications of Kant’s *Critique*, a reversal of the latter’s influence should not be deemed so futile that a revitalized pursuit of truth is discouraged. This essay offers only a modest proof. Hopefully, however, it is fortified by a novel account of ‘metaphysical’ first pieces of knowledge about the physical world, a reinvestment of this world with theological import, and a use of that import to reclaim a normative significance of the scientific enterprise.

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