

Kant, Natural Piety, and the Limits of Science

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Abstract: Although Kant's anti-mechanism has had a non-trivial impact in philosophical aesthetics and the philosophy of biology, an impact that in turn has been well-covered and well-studied in recent Kant-scholarship in those areas, this has not been, ironically enough, worked out in its specifically metaphysical implications, but instead only in either its history-of-ideas influence or its epistemological implications.

Keywords: anti-mechanism, pre-Critical periods, proto-Critical period

Resumo: Kant é um crítico meta-filosófico sério da metafísica racionalista clássica. Tal crítica esta exposta na Crítica da Razão Pura. No entanto, é pouco conhecida e às vezes até completamente esquecida, até mesmo pelos kantianos e estudiosos de Kant, para não mencionar os não-kantianos. Kant é um sério meta-filosófico de primeira ordem – mas ao mesmo tempo um crítico do naturalismo científico, ou seja, da doutrina de que tudo no mundo, inclusive nós mesmos, somos em última instância matéria, e que "a ciência é a medida de todas as coisas", além do mecanismo natural, isto é, a doutrina de que todos os processos naturais são, Físicos, inertes, operando de acordo com leis naturais estritas e algoritmos primitivos-recursivos, especialmente na Crítica do Poder do Julgar. Penso que a principal razão para isso é que os estudiosos de Kant cuidaram e ainda tendem a concentrar-se muito estreitamente nos períodos crítico e pré-crítico, à grave negligência do que eu chamei de período proto-crítico (de 1768 a 1772) E também o período pós-crítico (depois de 1787).

Palavra-Chave: anti-mecanismo, período pré-crítico, período proto-Critical.

The truly apocalyptic view of the world is that things do not repeat themselves. It isn't absurd, e.g., to believe that the age of science and technology is the beginning of the end for humanity; that the idea of great progress is a delusion, along with the idea that the truth will ultimately be known; that there is nothing good or desirable about scientific knowledge and that mankind, in seeking it, is falling into a trap.
It is by no means obvious that this is not how things are.

--L. Wittgenstein
(Wittgenstein (1980, p. 56e).

Time comes into it.
Say it.Say it.
The universe is made of stories,
not of atoms.

--M. Rukeyser
(Rukeyser (1971, verse IX).

[R]ational intelligibility is at the root of the natural order.

--T. Nagel
(Nagel 2012, p. 17).

1. Introduction

It is of course fully recognized by Kantians and widely known even outside Kantian philosophy, that Kant is a serious meta-philosophical critic of classical Rationalist metaphysics, especially in the *Critique of Pure Reason*. Nevertheless it is far less well-known and sometimes even completely overlooked, even by Kantians and Kant-scholars alike, not to mention non-Kantians, that Kant is also an equally serious meta-philosophical and also first-order-philosophical critic of both *scientific naturalism*, i.e., the doctrine that everything in the world, including ourselves, is ultimately physical, and that “science is the measure of all things,” and also *natural mechanism*, i.e., the doctrine that all natural processes are ultimately composed of purely physical, inert physical items operating according to strict natural laws and primitive-recursive algorithms, especially in the *Critique of the Power of Judgment*. I think the main reason for this is that Kant-scholars have tended and still tend to focus quite narrowly on the Critical and pre-Critical periods, to the serious neglect of what I have called the *proto-Critical* period (from 1768 to 1772) and also the *post-Critical* period (after 1787). In a recent essay, “Directions in Space, Non-Conceptual Form, and the Foundations of Transcendental Idealism,” I have offered reasons for taking the proto-Critical period very seriously; and I have also developed and defended Kant’s critique of scientific naturalism in detail in my book *Kant, Science, and Human Nature*.¹ Moreover, as I have also argued in two other recent essays,² I think that Kant’s anti-mechanism is the most seriously overlooked and underexploited part of what I call Kant’s *real metaphysics*, in contemporary philosophy. This overlooking and underexploiting is ironic because Kant’s anti-mechanism had a heavy influence on post-Kantian German idealism up to and including Hegel.³ And although Kant’s anti-mechanism has had a non-trivial impact in philosophical aesthetics and the philosophy of biology, an impact that in turn has been well-covered and well-studied in recent Kant-scholarship in those areas, this has not been, ironically enough, worked out in its specifically *metaphysical* implications, but instead only in either its *history-of-ideas* influence or its *epistemological* implications.⁴ But most ironically of all, Kant’s anti-mechanism has had an exceptionally deep and wide impact *outside* professional academic philosophy, in literature and other fine arts, and in the environmental movement. So what I want to focus on particularly in this paper are (i) Kant’s critique of natural mechanism in his post-Critical period, specifically

¹ Hanna (2015d); and Hanna (2006).

² For Kant’s anti-mechanism, see Hanna (2015f, esp. section 2); and for Kant’s real metaphysics, see Hanna (2015e).

³ See, e.g., Hanna (2013a).

⁴ See., e.g., Zammito (1992); Cohen (2009); Zuckert (2007).

developed as a thesis in real metaphysics, that I will call *Kantian anti-mechanism*, and (ii) developing Kantian anti-mechanism into a larger-scope, contemporary, radical Kantian philosophy of nature, including a radical philosophy of natural science, that I call *natural piety*. Why do I say that the doctrine of natural piety is “radical”? For three reasons. It is radical because (1) it is explicitly and robustly metaphysical—committed to what I call *liberal naturalism*—not merely epistemological, (2) it is explicitly and robustly value-driven, committed to what I call *the primacy of the normative*, with serious aesthetic, ethical, natural-religious, and sociocultural-political implications, and (3) it is explicitly and robustly *pro-science* without being in any way *scientistic*, where “scientism” is scientific naturalism, plus the dogmatic epistemic thesis that all methods of inquiry and knowledge are ultimately reducible to natural-scientific methods, plus the Baconian/Cartesian ideological-technocratic thesis that natural science is essentially a “lordship and mastery” over nature, including inert physical nature, non-human living or animal nature, and human nature alike. The radical nature of the doctrine of natural piety is also perfectly captured by Wittgenstein’s dark, edgy thoughts about the limits of science, already quoted in the first epigraph of the essay: [T]he age of science and technology is the beginning of the end for humanity; ... the idea of great progress is a delusion, along with the idea that the truth will ultimately be known; [and] there is nothing good or desirable about scientific knowledge and ... mankind, in seeking it, is falling into a trap.

2. From Kant’s Anti-Mechanism to Kantian Anti-Mechanism

It is well-known that in the *Critique of Pure Reason*, the *Prolegomena to Any Future Metaphysics*, and especially the *Metaphysical Foundations of Natural Science*, Kant is a self-described *Newtonian mechanist* about the manifest natural spacetime world, in which, as human animals, we must live, move, and have our being.

But as early as 1763, in his pre-Critical or Leibnizian/Wolffian period, in “The Only Possible Argument in Support of a Demonstration of the Existence of God,” Kant explicitly rejected the preformationist conception of biological generation and embryogenesis, according to which creatures pre-exist in their basic forms or structures, and require only the mechanical addition of bulk in order to develop.

Instead, he defended the *epigenetic* view, whereby the basic forms or structures of creatures themselves are emergently generated by the spontaneous but also rule-governed operations of a goal-oriented or teleological vital source of some kind. He even went so far as to assert that: it would be absurd to regard the initial generation of a plant or an animal as a mechanical effect incidentally arising from the universal laws of nature. (*OPA* 2:114)

In the *Prolegomena* he asserted the identity (or at least the strong continuity) of mind and life: “life is the subjective condition of all our possible experience” (*Prol 4*: 335).

In the Introduction to *Metaphysical Foundations*, he denied that there could ever be a naturally mechanistic science of psychology (*MFNS 4*:471).

In the second half of the *Critique of the Power of Judgment*, he not only asserted that “the mind is for itself entirely life (the principle of life itself)” (*CPJ 5*: 278) and also that “it would be absurd for humans ever to ... hope that there might yet arise a Newton who could make comprehensible even the generation of a blade of grass according to natural laws” (*CPJ 5*: 400), but also worked out a number of fundamental concepts and methodological themes in the philosophy of biology, including the notion of a living organism, or self-organizing system, the various distinct kinds of teleology, and the special role of teleological concepts and teleological thinking in the natural sciences.

Finally, in the unfinished “Transition” project in the *Opus postumum*, Kant also hypothesized the dual emergence of natural mechanisms and organismic life (including mind) alike from a single ontologically neutral but also non-static material substrate, the dynamic aether (21: 206-233, and 241).

So Kant’s commitment to Newtonian mechanism is, at the very least, somewhat conflicted.

Indeed, it is fully arguable that Kant is at bottom an *anti-mechanist*. This, in turn, is the upshot of Jennifer Mensch’s recent fascinating philosophical-historical study, *Kant’s Organicism*,⁵ which

starts by tracing the history of the life sciences as Kant would have come to know them, focusing especially on those philosophers and life scientists whose works directly engaged Kant during his intellectually formative years. Once Kant’s connection to the life sciences has been established, the remainder of the book moves to an examination of the exact nature of the influence of these sciences on the emerging critical system. When viewed from the perspective the life sciences in this manner, Kant’s theoretical philosophy becomes reframed as a philosophical project whose development was deeply influenced by the rise of organicism. (Mensch, pp. ix-x)

The thesis of *organicism*, in turn, “can be defined by its view of nature as something that cannot be reduced to a set of mechanical operations” (Mensch, p. 1).

⁵ Mensch (2013).

Amongst other things, *Kant's Organicism* nicely describes the intellectual state-of-play in natural history in the 17th and early 18th centuries. The first players are the mechanist corpuscularian Boyle, and Locke:

Locke was both a nominalist regarding species determination and a realist in believing that there were inner features contributing to species as well. In a similar fashion, Locke was both comfortable with a mechanical portrait of animal functioning and cognizant of the need for “inner principles” and “transformative forces” when it came to understanding the processes of organic life. And all this contributed to Locke’s views of both nature and the proper task of classification. Reviewing Locke’s early considerations of organic processes against the backdrop of corpuscular ontology reveals his sensitivity to the problems facing Boyle in the case of organic life. While Locke remained committed to the essential features of corpuscular science, he was nonetheless hesitant in the face of a straightforward endorsement of mechanical accounts of generation. (Mensch, pp. 27-28)

A similar hesitation as between mechanism and anti-mechanism can be found in the work of the second major player, Leibniz, who, heavily influenced by the Dutch microscopist Leeuwenhoek, took the view that “individuals were composed of living monads arranged hierarchically under a dominant entelechy or soul” (Mensch, p. 29).

In the *Monadology*, anticipating both the Turing test and also Searle’s Chinese Room argument, Leibniz famously argued, by means of a thought-experiment whereby the goal-directed conscious processes of mind cannot be reduced to the external behaviors of an enormously complicated mill, that mentality cannot be reduced to physical mechanical operations. But at the same time, Leibniz also thought of the living monads as *spiritual automata* pre-programmed by a 3-O (i.e., omniscient, omnipotent, and omnibenevolent) God, the supreme monad, and endorsed preformationism.

One philosophical moral of this part of the story, I think, is that the very idea of natural mechanism is a hybrid that combines (i) *physical causal necessitation under natural laws*, (ii) *Turing-computability*, and (iii) *natural determinism*.

But although physical causal necessitation under natural laws is sufficient for Turing-computability and determinism, it is not necessary. According to the Leibnizian account, there can be non-physical automata. Therefore we need to distinguish between (a) *causal mechanisms* (e.g., Coke machines) which are necessarily physical, and (b) *formal mechanisms* (e.g., Turing-computable processes) which, although they are physically realizable, are not necessarily physical: in principle, disembodied Cartesian souls could run Turing-computable sequences.

Kant is at least implicitly aware of this important distinction between causal mechanisms and formal mechanisms, because in the *Critique of Practical Reason* he explicitly rejects the reduction of all spontaneous activity, including life, but also especially including free will, to the operations of Leibnizian spiritual automata, deriding the latter as “the freedom of a turnspit” (*CPrR* 5: 97).

Mensch also traces the origins of organicism to Georges Buffon’s highly influential epigenesist treatise, *Natural History*, the first three volumes of which appeared in 1749:

With Buffon natural history ... became an attempt to grasp a living nature, to grasp species across time and, as a consequence, to base the classification of species upon genealogy. This marked a dramatic transformation in the history of a discipline that until then had been first and foremost a science oriented by its search for the means of discovering nature’s divisions and, for that reason, not at all by the patterns of its underlying unity. (Mensch, p. 50)

Strictly speaking, Buffon’s version of epigenesis is still compatible with mechanism (whether causal or formal). Correspondingly, the full theory of epigenesis would have to await the further postulation, in the 1780s, of organic vital forces or emergent vital forces, “like Caspar Wolff’s *vis essentialis* and Johan Blumenbach’s *Bildungstrieb*” (Mensch, p. 36)—which of course anticipate later more famous 19th and 20th century vitalist notions like Schopenhauer’s *Wille zum Leben* and Bergson’s *élan vital*. Nevertheless, the ground was prepared for Kant’s organicism.

Mensch also provides an account of Kant’s pre-Critical work on cosmological and biological questions of origin, and shows how this work not only smoothly fused with, but also primed, his Critical concern with the origins, scope, and limits of cognition and knowledge. As Mensch puts it, there was “an intimate connection, in Kant’s view, between attempts to discover a “principle of life” within natural organisms and the search for something beyond the limits of the everyday world.” (Mensch, p. 61)

In other words, Kant found a paradigm case of the burning need for his Critical distinctions between *phenomena and noumena* on the one hand, and between *the transcendental and the empirical* on the other hand, in the debate about the origins of life:

It was the unity of purposes within organic life, the fact that organisms could be both self-sustaining and vigilant regarding the need for repair,

that made natural products amazing, not the mechanical operations themselves. For Kant it was thus the principle of life, the capacity for a being's generation and self-organization that needed explaining, and recourse to neither supernatural nor purely mechanical grounds of explanation could satisfy that need. (Mensch, p. 64)

Basically, what is humanly cognizable and knowable about life (the organicist phenomena) are the non-mechanical, spontaneous activities of the perceivable organism, not some vital substance with an intrinsic non-relational essence hiding behind the appearances (the organicist noumenon).

Kant's organicism, as Mensch's book so effectively shows, captures Kant's brilliant insight that mechanical principles and facts cannot explain what I have been calling *the organicist phenomena*:

- (i) natural teleology or organismic life, including plants and animals,
- (ii) any organism with proprioceptive enantiomorphic awareness of the difference between its right side and its left side (or top and bottom, or front and back, etc.), or an awareness of the difference between its own past, present, and future: the feeling of egocentrically-centered (here) embodied orientation in a global space-structure with intrinsic directions, and egocentrically-centered (now) asymmetric duration in a global time-structure, i.e., the feeling of organismic, conscious life, whose phenomenal characters are all modes of pleasure or pain,
- (iii) human mentality, including consciousness, intentionality, imagination, conceptualizing, judging, and inferential reasoning,
- (iv) human spontaneity, agency, and source-incompatibilist free will, and
- (v) human non-instrumental normativity.

But at the same time, Kant himself could never fully advance beyond the thesis that organicist concepts have only a *regulative* use, not a *constitutive* use.

Why not? It seems to me that Kant was needlessly bedazzled by the very ideas of Newtonian mechanics and Newtonian mechanism, as jointly constituting a hyper-successful research program in 17th and 18th century natural science.

Over-impressed by this (admittedly still very impressive) Newtonian program, Kant could not see that the existence of a natural world that fundamentally contains significantly many causal-mechanical and formal-mechanical deterministic processes is perfectly consistent with the manifest organicist fact that the natural world *also* fundamentally contains significantly many *non-mechanical, non-deterministic* processes in it, including teleological and mental processes, as well as inherent non-instrumentally normative rules guiding these processes.

Indeed, we already know from Gödel's second incompleteness theorem that formal-mechanical processes of Turing-computable *proof* presuppose non-mechanical semantic processes of non-Turing-computable *truth-determination*. So universal formal mechanism is provably false. Why then should we accept universal *causal* mechanism, especially when one of its necessary conditions is the supposed universality of formal mechanism?

In other words, what I am proposing is that, with the organicist phenomena as a starting-point, we can metaphysically postulate that the natural world is fundamentally *dual aspect*, and that it is at once mechanical-deterministic in one of its fundamental dual aspects, and also non-mechanical-non-deterministic (in a word, *organicist*), in the other of its fundamental dual aspects, including the irreducible existence of both causally non-mechanical processes and also formally non-mechanical processes.

So, quite apart from Kant's own needless deference to the Newtonian research program, we can, in a fully Kantian spirit, put forward the radical thought that there is a fully *constitutive* use of organicist concepts, *insofar as they are required by a transcendental inference to the best explanation of all the organicist phenomena*.

Or, as Thomas Nagel formulates essentially the same point in *Mind and Cosmos* (for which, predictably, he received a torrent of angry criticism from scientific naturalists¹), we can metaphysically postulate a "cosmic predisposition to the formation of life, consciousness, and the value that is inseparable from them."⁶

In any case, here is the basic line of reasoning behind that radical Kantian thought.

Kant's fundamental philosophical problem, the one that he struggled with throughout his long philosophical career, is this: How can the existence of non-mechanical, non-deterministic facts that are necessary for the purposes of morality, be made consistent and coherent with the thesis that necessarily, all the natural objects studied by physics (i.e., the "objects of experience") are mechanical and deterministic?

⁶ The standard criticisms of Nagel (when they aren't simply *ad hominem*) are (i) that he is ignorant of recent and contemporary work in evolutionary biology, and (ii) that he completely overlooks the distinction between reductive and non-reductive biological (or more generally, scientific) naturalism. I think that these worries are nothing but philosophical red herrings, intentionally or unintentionally employed in order to avoid facing up to the deep anti-mechanist/organicist-idealist/liberal naturalist point that Nagel is trying to make. See Hanna (2013d).

Since all organisms, including conscious rational human organisms, or human persons, are non-mechanical and non-deterministic, then Kant's fundamental problem becomes focused like a laser beam on this specific formulation of his fundamental problem: How can the existence of living conscious rational human animals, i.e., human persons, capable of genuine incompatibilistic free will, necessary for the purposes of morality, be made consistent and coherent with the thesis that necessarily, all the natural objects studied by physics (the "objects of experience") are mechanical and deterministic?

Now as every reader of the first *Critique* knows, for Kant, there are two basic kinds of objects:

(i) *phenomena*, namely spatiotemporal objects directly accessible to and knowable by human sensory intuition and sense perception, that are constituted by relational properties, especially including relations to actual or possible human sensible minds, and

(ii) *noumena*, namely non-spatiotemporal, humanly sensorily inaccessible, unperceivable, and unknowable objects, which may or may not exist, but even if they do exist, are constituted by intrinsic non-relational properties, and are at best barely consistently thinkable by means of concepts.

But what many readers of the first *Critique* have *not* noticed is that equally important for Kant is the distinction, exclusively within the domain of phenomena, between: (ia) *undetermined* objects of empirical intuition, a.k.a., *appearances*, and (ib) *fully determined* objects of empirical intuition, empirical concepts, empirical judgments, and pure *a priori* concepts of the understanding, a.k.a. *objects of experience*.

For Kant, as a Newtonian mechanist and also a LaPlacean determinist about physical nature insofar as it is correctly described by physics, *mechanism necessitates natural determinism*, and conversely, *natural determinism entails mechanism*. So all the actual and possible objects of experience are mechanical and deterministic.

But here's the rub: all and *only* the actual and possible objects of experience are mechanical and deterministic, but *not* all the actual or possible appearances. Since the total set of pure *a priori* concepts of the understanding specifies a world of objects inherently governed by Newtonian mechanistic principles and laws, then, although all the fully determined objects, i.e., the objects of experience, are inherently governed by Newtonian mechanistic principles and laws, and therefore are *deterministic* and not free, it does *not* follow that all the *undetermined* objects, i.e., the appearances, are either mechanical (whether causal-mechanical or formal-mechanical) or deterministic.

In other words, since for Kant the sensible intuitability of an object, independently of concepts, is the criterion of the object's real possibility, then it is either actual or at least really possible that at least *some appearances* are non-mechanical and non-deterministic, and that they are cognitively accessible by means of *essentially non-conceptual sensible intuitions*.⁷

Let us call such essentially non-conceptually sensibly intuitable appearances, insofar as they actually exist, or were they to exist, *rogue objects*, since they fall outside the Categories and the system of transcendental principles, or at least fall outside Kant's "constitutive" *causal-dynamical principles* (i.e., the Analogies of Experience, and the Postulates of Empirical Thought) and therefore outside the deterministic causal laws of nature,² even if they do continue to fall under the "regulative" *mathematical principles* (i.e., the Axioms of Intuition, and the Anticipations of Perception).

The actual existence or real possibility of rogue objects would mean that the phenomenal natural world, i.e., the manifest world, the world of Wilfrid Sellars's "manifest image,"³ actually or really possibly includes some *appearances* that are also not *objects of experience*, namely the rogue objects, and that we can access these rogue-object phenomena only through essentially non-conceptual intuition.

These non-mechanical, non-deterministic rogue-object phenomena, in turn, would include *all and only the organicist phenomena*, as specified above, and this would in turn directly imply that the phenomenal natural or manifest world includes some objects that are also *not* objects of mechanistic physics, mechanistic chemistry, and mechanistic biology, and therefore also that mechanistic natural science is *not*, to borrow Sellars's famous phrase, "the measure of all things."⁸

So *scientific* or *physicalist* naturalism (whether reductive or non-reductive) would be false, and mechanistic natural science would apply to all and only the natural objects and facts to which it applies, but not to all actual or possible natural objects and facts. In short, mechanistic natural science would have *philosophical limits within nature itself*.

Contrary to scientific or physicalist naturalism, then, the thesis of *liberal* or *organicist-idealist* naturalism would be true.

⁷ See Hanna (2005); Hanna, (2008); Hanna (2011a); Hanna (2013c, supplement 1); and Hanna (2015b, ch. 2).

⁸ See Hanna (2011b); Hanna (2013b); Hanna (2015a).

More precisely, the liberal naturalist, or organicist-idealist naturalist, thesis says that the manifest world fundamentally contains the real existence or real possibility of organismic life, the feeling of life, mind, source-incompatibilist free will, persons, and non-instrumental normativity as basic organicist facts of nature, along with the basic formal-mechanical and causal-mechanical physical facts, and that the basic kind of item is *dynamic systems, or dynamic processes*, both mechanical/deterministic and non-mechanical/non-deterministic, such that the mechanical/deterministic kind presupposes either the actual existence or the real possibility of the non-mechanical, non-deterministic kind.⁹

Bluntly put: *source-incompatibilist free will is a fact of organismic life, and partially constitutive of physical nature.*

Or in Nagel's words again, "rational intelligibility is at the root of the natural order," and there is a "cosmic predisposition to the formation of life, consciousness, and the value that is inseparable from them."

This, in turn, would solve Kant's fundamental problem, not by appealing to anything *supernatural*, but instead *by liberalizing our concept of physical nature.*

3. Natural Piety and the Limits of Natural Science

Anti-mechanism in its classical early 20th century guise, as "British emergentism," has its original intellectual roots in Aristotle's *De Anima* and *Physics*, and in the 17th and 18th century epigenesist-organicist tradition so well described by Mensch, when these accounts are combined with late 18th and early 19th century Romantic conceptions of nature, expressed for example in the seventh of Rousseau's *Reveries of a Solitary Walker*, Wordsworth's and Percy Shelley's poetry, and their notion of "natural piety," by Mary Shelley's stunning critique of mechanistic-reductive scientific sins against natural piety, in *Frankenstein*, and by Caspar David Friedrich's and J.M. Turner's nature paintings.

All or most of these, in turn, have their proximal intellectual sources in Kant's assertions of the cognitive-semantic limits of science and scientific knowledge in the *Critique of Pure Reason*, of anti-mechanism in his moral and political philosophy, and also of a direct

⁹ See Sellars (1963b).

epistemic, metaphysical, and moral link, via immediate consciousness, between the “starry heavens above me” and the “moral law within me” at the end of the *Critique of Practical Reason*, taken together with his closely-related notions of *the beautiful in nature*, *the sublime*, *genius*, *life*, and *purposiveness-without-a-purpose* in the *Critique of the Power of Judgment*.

Correspondingly, here are some of the most important texts in this “natural piety” tradition, running from Rousseau and Kant through Wordsworth, and the Shelleys to the British emergentist, Samuel Alexander:

A deep and sweet revery seizes your senses, and you lose yourself with a delicious drunkenness in the immensity of this beautiful system with which you identify yourself. Then all particular objects fall away; you see nothing and feel nothing except in the whole... I never meditate or dream more delightfully than when I forget my self. I feel indescribable ecstasy, delirium in melting, as it were, into the system of beings, in identifying myself with the whole of nature. Brilliant flowers, enamelled meadows, fresh shades, streams, woods, verdure, come, purify my imagination ... My soul, dead to all strong emotions, can be affected now only by sensory objects, and it is only through them that pleasure and pain can reach me.¹⁰

[I] had to deny scientific knowledge (*Wissen*) in order to make room for faith (*Glauben*). (*CPR Bxxx*)

When nature has unwrapped, from under this hard shell, the seed for which she cares most tenderly, namely the propensity and calling to *think* freely, the latter gradually works back upon the mentality of the people (which thereby gradually becomes capable of *freedom* in acting) and eventually even upon the principles of *government*, which finds it profitable to itself to treat the human being, *who is now more than a machine*, in keeping with his dignity. (*WE* 8: 41-42, underlining added)

All necessity of events in time in accordance with the laws of natural law of causality can be called the *mechanism* of nature.... Here one looks only to the necessity of the connection of events in a time series as it develops in accordance with natural law, whether the subject in which this development takes place is called *automaton materiale*, when the machinery is driven by matter, or with Leibniz *spirituale*, when it is driven by representations; and if the freedom of our will were none other than the latter..., then it would at bottom be nothing other than the

¹⁰ See, Rousseau (2011, seventh revery). Many thanks to Ericson Falabretti for reminding me about Rousseau’s important influence on Kant’s philosophy of nature, both human and non-human.

freedom of a turnspit, which, when once it is wound up, also accomplishes its movements of itself. (*CPrR* 5: 97, underlining added)

[T]wo things fill the mind with ever new and increasing admiration and reverence, the more often and more steadily one reflects on them: *the starry heavens above me and the moral law within me*. I do not need to search for them and merely conjecture them as though they were veiled in obscurity or on the transcendent region beyond my horizon; I see them before me and connect them immediately with the consciousness of my existence. (*CPrR* 5: 161-162, underlining added)

An organized being is ... not a mere machine, for that has only a **motive** power, while the organized being possesses in itself a **formative** power, and indeed one that it communicates to matter, which does not have it (it organizes the latter): thus it has self-propagating formative power, which cannot be explained through the capacity for movement alone (that is, mechanism). (*CPJ* 5: 374)

It is quite certain that we can never adequately come to know the organized beings and their internal possibility in accordance with merely mechanical principles of nature, let alone explain them; and this is so certain that we can boldly say that it would be absurd for humans to make an attempt or to hope that there could ever arise a Newton who could make comprehensible even the generation of a blade of grass according to natural laws that no intention has ordered; rather we must absolutely deny this insight to human beings. (*CPJ* 5: 400, underlining added)

My heart leaps up when I behold
A rainbow in the sky:
So was it when my life began;
So is it now I am a man;
So be it when I shall grow old,
Or let me die!
The Child is father of the Man;
And I could wish my days to be
Bound each to each by natural piety.¹¹

Earth, ocean, air, below'd brotherhood!
If our great Mother has imbued my soul

¹¹ Wordsworth (1807).

With aught of natural piety to feel
Your love, and recompense the boon with mine.¹²

One of the phaenomena which had peculiarly attracted my attention was the structure of the human frame, and, indeed, any animal endued with life. Whence, I often asked myself, did the principle of life proceed? ...To examine the causes of life we must first have recourse to death. I became acquainted with the science of anatomy: but this was not sufficient; I must also observe the natural decay and corruption of the human body.... Now I was led to examine the cause and progress of this decay, and forced to spend days and nights in vaults and charnel houses....I paused, examining and analysing all the minutiae of causation, as exemplified in the change from life to death, and death to life, until from the midst of this darkness, a sudden light broke in upon me.... After days and nights of incredible labour and fatigue, I succeeded in discovering the cause of generation and life; nay, more, I became capable of bestowing animation upon lifeless matter.... I see by your eagerness, and the wonder and hope which your eyes express, my friend, that you expect to be informed of the secret with which I am acquainted; that cannot be; listen patiently until the end of my story, and you will easily perceive why I am so reserved upon that subject. I will not lead you on, unguarded and ardent as I then was, to your destruction and infallible misery. Learn from me, if not by my precepts, at least by my example, how dangerous is the acquirement of knowledge, and how much happier that man is who believes his native town to be the world, than he who aspires to become greater than his nature will allow.¹³

I do not mean by natural piety exactly what Wordsworth meant by it—the reverent joy in nature, by which he wished that his days might be bound to each other—though there is enough connection with his interpretation to justify me in using his phrase. The natural piety I am going to speak of is that of the scientific investigator, by which he accepts with loyalty the mysteries which he cannot explain in nature and has no right to try to explain. I may describe it as the habit of knowing when to stop in asking questions of nature.

[T]hat organization which is alive is not merely physico-chemical, though completely resolvable into such terms, but has the new quality of life. No appeal is needed, so far as I can see, to a vital force or even an *élan vital*. It is enough to note the emergence of the quality, and try to describe what is involved in its conditions.... The living body is also physical and chemical. It surrenders no

¹² P. Shelley (1816).

¹³ M. Shelley (1818, vol. 1, ch. 3, underlining added).

claim to be considered a part of the physical world. But the new quality of life is neither chemical nor mechanical, but something new.

We may and must observe with care our of what previous conditions these new creations arise. We cannot tell why they should assume these qualities. We can but accept them as we find them, and this acceptance is natural piety. (Alexander (1939, pp. 299, 310-311, and 306, underlining added).

Because I am taking Kant's transcendental idealism to be *a real*, and in particular, *an empirically realistic* metaphysics of nature, and not merely epistemology, it follows with synthetic a priori necessity that space, time, quantity, movement, organismic life and natural teleology, consciousness, feeling and emotion, aesthetic form including beauty and sublimity, and morality, are all manifestly real, ontologically basic structures in the natural world of human experience.

The Kantian-Romantic-British-emergentist philosophical doctrine of *natural piety*, as I understand it, then, counsels a radically agnostic, empirically realistic, and metaphysically sane (where the criteria of metaphysical sanity are determined by Kant's critique of modal metaphysics in the Transcendental Dialectic), aesthetically-sensitive, ethically-sensitive, natural-religious, and above all anti-mechanistic, non-reductive, non-dualist, primitivist approach to investigating nature, that is pro-science but not scientific, by virtue of knowing the inherent scope and limits of natural-scientific investigation.

Natural piety, in turn, *as a thesis in real metaphysics* and also *as an aesthetic, emotional, and natural-religious, action-guiding, and above all life-guiding, respectful and reverential attitude towards manifest nature*, is intended as an essential corrective to the epistemic and metaphysical arrogance, and also to the aesthetic insensitivity and military-industrial authoritarianism, of the noumenally realistic, reductive, naturally mechanistic epistemology and metaphysics of the "scientific conception of the world" and its corresponding deeply exploitative "lordship and mastery of nature" ideology, fully aligned with global corporate capitalist technocracy,¹⁴ as it has been explicitly or implicitly developed, defended, and disseminated by Bacon,¹⁵ by Descartes,¹⁶ by The Vienna Circle,¹⁷ and by recent and contemporary scientific naturalists.

¹⁴ See, e.g., Olivier (2005).

¹⁵ See, e.g., Bacon (1620).

¹⁶ Descartes (1984, part 6, p. 142/AT VI, 62).

Thus the real-metaphysical-thesis-and-life-guiding-respectful-and-reverential attitude of natural piety gives a rich sense to the radical poet Muriel Rukeyser's deep insight that "the universe is made of stories, not of atoms."¹⁸

The real universe, the one that *really matters* for rational but also "human, all too human" creatures like us, is made of *minded animals, especially human persons*, and their manifestly real normative "stories," NOT of *fundamentally physical, life-excluding, mind-excluding, freedom-excluding matter* and its noumenal-microphysical "atoms."

That is: not only, in Nagelian terminology, is "rational intelligibility is at the root of the natural order," such that there is a "cosmic predisposition to the formation of life, consciousness, and the value that is inseparable from them," but also our philosophical recognition of these facts *puts inherent epistemic, metaphysical, aesthetic, ethical, natural-religious, and sociocultural-political critical limits on the scope of natural science.*

In short, Kantian natural piety is real metaphysics, "metaphysics with a human face," but above all it is committed to *the primacy of the normative*, that is, to the thesis that metaphysics has axiological foundations, and also direct aesthetic, ethical, natural-religious, and sociocultural-political implications, that are all in direct opposition to the deeply wrong-headed 20th and 21st conception of metaphysics as supposedly value-free (but actually aesthetically, ethically, anti-religiously, socioculturally, and politically deeply-committed, via scientism¹⁹ and global corporate capitalism), "scientific philosophy" and "rigorous science," *streng* *Wissenschaft*.

As Kant so brilliantly anticipated in the 1780s and 1790s, and as Wittgenstein so rightly explicitly pointed out in the 1930s, in accepting the reductive, mechanistic, ideological-technocratic, and ultimately Frankensteinian "scientific conception of the world," we are *falling into a trap that is the beginning of the end for humanity*; and what I am saying is that we can avoid this death-trap *only* by theoretically adopting, by taking to heart, and then by freely acting according to, the real-metaphysical, epistemological, aesthetic, ethical, natural-religious, and sociocultural-political doctrine of natural piety.^{20, 21}

¹⁷ See, e.g., The Vienna Circle (1929).

¹⁸ See note 3 above.

¹⁹ See, e.g., Scott (1999).

²⁰ See also Olivier (2005, pp, 120-121).

References.

For convenience, throughout this essay I cite Kant's works in parentheses. The citations include both an abbreviation of the English title and the corresponding volume and page numbers in the standard "Akademie" edition of Kant's works: *Kants gesammelte Schriften*, edited by the Königlich Preussischen (now Deutschen) Akademie der Wissenschaften (Berlin: G. Reimer [now de Gruyter], 1902). For references to the first Critique, I follow the common practice of giving page numbers from the A (1781) and B (1787) German editions only. Because the Akademie edition contains only the B edition of the first Critique, I have also consulted the following German composite edition: *Kritik der reinen Vernunft*, ed. W. Weischedel, Immanuel Kant Werkausgabe III (Frankfurt: Suhrkamp, 1968). For references to Kant's *Reflexionen*, i.e., entries in Kant's *handschriftliche Nachlaß*—which I abbreviate as 'R'—I give the entry number in addition to the Akademie volume and page numbers. The translations from the *Reflexionen* are my own. I generally follow the standard English translations of Kant's works, but have occasionally modified them where appropriate. Here is a list of the relevant abbreviations and English translations:

CPJ Critique of the Power of Judgment. Trans. P. Guyer and E. Matthews. Cambridge: Cambridge Univ. Press, 2000.

CPR Critique of Pure Reason. Trans. P. Guyer and A. Wood. Cambridge: Cambridge Univ. Press, 1997.

CPrR Critique of Practical Reason. Trans. M. Gregor. In *Immanuel Kant: Practical Philosophy*. Cambridge: Cambridge Univ. Press, 1996, pp. 139-272.

MFNS *Metaphysical Foundations of Natural Science*. Trans. M. Friedman. Cambridge: Cambridge Univ. Press, 2004.

OPA "The Only Possible Argument in Support of a Demonstration of the Existence of God." Trans. D. Walford and R. Meerbote. In *Immanuel Kant: Theoretical Philosophy 1755-1770*. Cambridge: Cambridge Univ. Press, 1992. Pp. 107-201.

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Prolegomena to Any Future Metaphysics. Trans. G. Hatfield. Cambridge: Cambridge Univ. Press, 2004.

“An Answer to the Question: What is Enlightenment?” In Immanuel Kant: Practical Philosophy, pp. 17-22
