Semiosis in the Machine: Lost Natures and Artificial Intelligence

Brian Kemple
Lyceum Institute
kemple@lyceum.institute

Abstract
The rapid development and advance of artificial intelligence technologies has, in many ways, outpaced the philosophical and semiotic understanding of how these developments may affect our own cognitive lives. This article intends to draw focus to the unexamined tensions being strained by these technological advances. Primarily, the goal is to raise questions concerning the nature of nature, of intelligence, and of the role of semiosis in our integration with machine technologies. By raising these questions, we intend to indicate (as best as we can in so short a composition) the grave danger that an unthinking incorporation of artificial intelligence poses to the functioning of our own species-specifically human intellectual activity.

Keywords: artificial intelligence, understanding, semiosis, semiotic animal, nature, autopoiesis.

0. Introduction

At St. Vincent's Archabbey in Latrobe, Pennsylvania—the cemetery of which serves as the late John Deely's final resting place—there is a steam-powered gristmill, continuously in operation since 1854, which to this day offers stone-ground flour to visitors and the community alike. The building is old, by American standards (always young by those of Europe). Stepping inside, one senses a past, a *history*; a way of acting that seems antiquated and obsolete, as though its continuation signifies either an obstinate traditionalism, a Luddite sentiment, or a quirky hyperreal simulacra—a performative recall of a no-longer-real past, made to seem as real as possible. There are many such historical simulacra in the United States: re-enactments of Revolutionary and Civil War battles, eighteenth-century homes turned into museums, strange transformative pseudo-historical plays, movies, theme parks, and so on.

But the gristmill *is* real. The flour is not milled elsewhere, more efficiently, and sold in pretense of being the Archabbey's own. The grinding of its steam-powered stone, the creaking of its wood supports, the clacks and cranks and whispers of all the machine tools: they *speak*, of today and of years past—in a language foreign to the modern tourist, but familiar to its operators. One needs no simulated re-presentation to hear the mill's voice, for it represents itself, little different than always it has been.

This self-representation of tools, the instruments, of human industry has long been a trope of literary depiction: the *song* of sound hammer and anvil, the steady rhythm of a sharp scythe, the *groan* of a rusty plow, the *ailing* hum of a motor. It is a metaphor familiar and natural, a ready-made translation between an inhuman voice and a human framework of interpretation—instruments being, by their nature, ordered towards the fulfillment of human purpose. We ascribe to our inventions a language, as they communicate to us within the purposes for which we have designed them.

But with our digital tools—products of a development so rapid, historically, that we have not "caught up" to the changes it renders in our own being—we find the language seemingly universal; so universal, so adroit, so dynamic, that it seems in need of no translation by metaphor into meaning. We know the engine, the windmill, the hammer and the typewriter, though they may "speak", do so only by such a translation, a radical re-casting of their signification into a context entirely unlike that in which originally they signify. The shrieking of an automobile's brakes does not signify "pain"; but it may, to us, signify a state of near-failure, such that we may meaningfully say, "those brakes sound pained". The computer, however, not only but especially with the advent of Large Language Model (LLM) and especially Generative Pre-trained Transformer (GPT) technologies, seems so adept at communicating in *our own* human languages that it needs no translation. Among the intentions pursued in the development of such technology, one finds the "self-generating" or "self-organizing" machine as a goal (and, for that matter, a fear). From DeepBlue, to AlphaGo and AlphaZero and MuZero, and now to ChatGPT-4, AutoGPT and all the other derivatives—the goal has been for machines to be freed from the limitations that seemingly inhibit human progress; the fear has been that those limits are precisely what keeps humanity surviving and, in some cases, may incidentally cause us also to thrive. The spark of this fear seems stoked by the opacity of LLM interpretative processes: when asked questions that can be verified, they seem increasingly capable of answering correctly; but how they arrive at those answers cannot be observed by a human being. Their processing occurs in a "black box" by comparing a hypercomplex pattern of particulars, too fast for the human mind to follow—discerning patterns which may be numerically consistent but are in and of themselves often, even when extrapolated and analyzed by human beings, unintelligible as relating to any evident *causality*. Thus the spark turns into a blaze: might the machine not only become *more* intelligent than the human being, but, indeed, *incomprehensibly* so?

Prior to the optimism and the fear, however, there remain important and unanswered questions—or rather, I should say, presupposed answers for which the questions are never genuinely asked—which undermine our ability to grapple with supposed "artificial intelligence". It is these questions or presuppositions which this article seeks to unveil, a seeking that will unfold across four parts: first, given the inherently interdisciplinary nature of semiotics and its audience, I will specify the inquiry in terms of three key definitions—autopoiesis, semiosis, and meaning—and three corresponding questions essential to an understanding of "artificial intelligence". Second, building upon the first of these, I will consider autopoiesis and the nature of machine constitution. Third, by unfolding semiosis as a process which is always autopoietic in its realization, we will ask whether the processes of machines can be considered as a semiosic. Fourth, consider the inherent relationship between intelligence and meaning. Subsequently, we will conclude with a reflection upon the danger of that meaning being lost in a world permeated by artificial intelligence.

Ultimately, what we aim to demonstrate in this paper can be stated thus: artificial intelligence poses a grave threat to the exercise of our proper humanity through subverting our ability to think.

1. Three Definitions and Three Questions

Conceptual confusions, ambiguities, and imprecisions both underlie and therefore undermine much contemporary inquiry into the notion of intelligence—human, animal, and artificial alike. An unwillingness (or perhaps inability) to articulate clearly one's presuppositions has rendered

much scientific literature concerning intelligence, including that produced within semiotics, obscure rather than clear. Thus, it is important for the reader to know that the present author takes an Aristotelian philosophical perspective, conjoined with the semiotic of John Poinsot (also known as Joannes a Sancto Thoma), Charles Sanders Peirce, and John Deely.[1] Thus, even though we use terminology perhaps from other traditions, these terms are coaptated to that fundamentally coherent Aristotelian-Semiotic tradition.

But, because this coaptation may not be immediately clear, particularly given the potentially diverse audience reading any journal of semiotics, it proves appropriate to provide some fundamental definitions, so as to demonstrate this coherence. By means of these definitions we will also establish the essential direction of this article's inquiry into artificial intelligence.

1.1. Autopoiesis and Nature

The first terminological difficulty with which we must contend concerns the terms "autopoiesis" and "nature". The term "autopoiesis" was coined by Humberto Maturana and Francisco Varela to provide a fitting semantic signifier for the "autonomous" organization of living systems; that is, to signify the way in which living beings operate in manners irreducible to extrinsic causes, which seems to be from an intrinsic principle of self-originating organization. A full critique of Maturana and Varela would exceed our bounds; suffice it only to say that their efforts, though laudable in many respects—not least of which, coining this apt word—nevertheless demonstrate a shallow understanding of the history of philosophy, and especially of the Aristotelian tradition. In defining living systems as autopoietic ***machines***,[2] they proceed according to a centripetal anthropocentrism[3] conceived according to an operative imperative or technological thinking:[4] a thinking, in other words, that even when attempting to define beings independent of human cognition, resolves them primarily (if not exclusively) into the framework of human productive causality.[5]

[1] *Semiotic* here is distinguished from *semiotics* as a doctrine distinguished from a field. Cf. Deely 1985: "Editorial Afterword" in *Tractatus de Signis*, 416: "This foundational doctrine we may distinguish from the much larger, and, in one very important sense, limitless *field* of 'semiotics': that is, the development of attempts to isolate and pursue the implications of specifically signifying *aspects* and elements of phenomena, natural or socio-cultural, that are studied in their own right by the range of traditional specialized pursuits (music, architecture, ethology, etc.) now becoming sensitized to the semiotic *dimension* that permeates all things."

[2] In their fullest statement, 1972: *Autopoiesis and Cognition* (emphasis original), 78-79: "*a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components that produces the components which:* (i) *through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and* (ii) *constitute it (the machine) as a concrete unity in the space in which they (the components) exist by specifying the topological domain of its realization as such a network*." This cumbersome definition says poorly what Aristotle says not only more succinctly but more pointedly in his definition of the soul.

[3] I.e., the anthropomorphism whereby the human is made the measure of all things. Cf. Deely 1994: *New Beginnings*, 179.

[4] I.e., the thinking that determines us in all bearing towards control. Cf. Engelmann 2017: *Nature and the Artificial*, 1–15 and *in passim*.

[5] In the words of Edward Engelmann (2017: *Nature and the Artificial*, 3): "The absurdity of the Aristotelian metaphysical categories appears obviously only if the clockwork metaphysical model for nature is also taken to be obvious."

Despite this, I find the term "autopoiesis", in fact, to be a richly descriptive indication of what Aristotle originally conceived in the notion of **nature** or φύσις—namely, an originating order belonging properly to a substantial being, such that it is *toward* some end or purpose intrinsic to itself[6]—and specifically of the nature that is a **soul** or ψυχή: "a being-at-work-staying-itself of the first kind [i.e., a persistent immanent actuality or ἐντελέχεια] of a natural [i.e., 'physical'] body having life as a potency."[7] While this definition requires much thinking and study fully to understand (not least of which need stems from Aristotle's temporal and contextual difference from ourselves), we ought here to focus on the **ἐντελέχεια of a living body**. In other words, this "being-at-work-staying-itself", as Joe Sachs has translated it, expresses the same key idea as Maturana and Varela's autopoiesis: the continual action of being-what-it-is, an action which may unfold throughout but does not reduce to a pattern of diverse processes.[8] *Staying-itself* is not a static or calcified mode of being—but living beings, being what they are, are indeed *autopoietic*.
Autopoietic nature consists not merely in homeostatic maintenance of itself, however, but also in a kind of *being-toward-others*, as the consequence of its being what it is.[9] Finite beings intrinsically manifest themselves through communicative relations to others, relations which unfold from the natural principle. Modern thought has often taken as an unquestioned presupposition that the natural principle, in fact, names only the coincident arrangement of the constituent parts, such that the correct arrangement of parts alone will suffice to produce the natural being; or, most pertinently for our topic here, whether we can affect the same consequences with an artificial and digitized replication. But might there be something *more* to the autopoietic than the determinate arrangement of parts?
The corresponding question to this twofold definition, of nature as autopoietic and as ἐντελέχεια, is this: are machines—defined here provisionally as *artificial*—truly autopoietic? The question is not merely whether they are *self-originating*, since this would in nowise differentiate the machine from the organic being, but, rather, whether they are *self-moving* in the true sense.

1.2. Semiosis and Interpretation

To be "self-moving": this, in a manner, seems another way of saying: "to be semiosic", that is, to be a being that *of itself* makes use of signs. Even outlining the contours of this notion—semiosis—proves an enormous task.[10] Nevertheless, if we are to understand the nature of artificial

[6] Cf. Heidegger 1939: *Vom Wesen und Begriff der Φύσις. Aristoteles, Physik B, 1*, 239–302.

[7] Aristotle c.330BC: *On the Soul*, 412a 32-33.

[8] For more on φύσις in contrast to τέχνη in Aristotle, Heidegger, and modernity, see Kemple (forthcoming) "Τέχνη, Φύσις, and the Technological" in *Reality: a journal for philosophical discourse*.

[9] A point observed implicit in much traditional philosophy and expressed explicitly in the Trinitarian theology of Thomas Aquinas, who ascribes to all creatures (1266-68: *ST* Ia, q.45, a.7, c.) an innate ordering towards other beings based upon their existence and essential being.

[10] Cf. Maryann Ayim 1994: "Semiosis" in *Encyclopedic Dictionary of Semiotics*, vol.2, N–Z, 888: "Although there is widespread agreement concerning the broad general meaning of *semiosis* and its central role in the field of semiotics, there are nevertheless divergent analyses of the nature of the relationship between semiosis and semiotics as well as the specific components of semiosis itself." As Ayim continues, for Peirce (888-89): "it is not possible to draw a hard and fast distinction between sign action and sign interpretations — these are not two distinct types of activity, but simply different perspectives on the same activity." Cf. Peirce 1907: "A Survey of Pragmaticism", 5.484. Ayim further notes (890-91) that the interpretant itself has diverse classes (on which the nomenclature varies across Peirce's work). For the sake of relative simplicity in this article, we restrain ourselves to considering the **immediate**, **dynamic**,

intelligence and its potential impact upon how we live, it proves equally enormous in its consequences that we identify precisely what is meant by "semiosis". Rather than get lost in the literature, however, we will posit—along with John Deely and many others following him—that "semiosis" is best defined as "the action of signs". A "sign", in this regard, must not be incorrectly regarded as merely the "sign-vehicle", but rather the complete accomplished relation between object and interpretant which is affected by that sign-vehicle. The action, therefore, consists in the realized relation of interpretant *towards* the object. The sign-vehicle therefore determines the relatively-indeterminate interpretant such that, being so determined, the interpretant somehow *reorients itself* toward the object. Without such a determinative reorientation, we have at best only a *virtual* semiosis. If the interpretant is wholly inert consequent to the action of the sign-vehicle, the semiosis has not yet attained actuality—for which there is required a **genuine triadicity**, and not merely a concatenation of dyadic relations.[11]
This triadicity consists in the interpretant itself being triadically engaged:[12]

> from that proposition that one event *Z* is subsequent to another event, *Y*, I can at once deduce by necessary reasoning a universal proposition. Namely, the definition of the relation of apparent subsequence is well known, or sufficiently so for our purpose. *Z* will appear to be subsequent to *Y* if and only if *Z* appears to stand in a peculiar relation, *R*, to *Y* such that nothing can stand in the relation *R* to itself, and if, furthermore, whatever event, *X*, there may be to which *Y* stands in the relation *R* to that same *X*, *Z* also stands in the relation *R*. This being implied in the meaning of subsequence, concerning which there is no room for doubt, it easily follows that whatever is subsequent to *C* is subsequent to anything, *A*, to which *C* is subsequent, which is a universal proposition.

To be "self-moving": this phrase would be misunderstood were it thought appropriately applied only to beings without any extrinsic causality exercised upon them. Alone among the observed entities of the universe, it would then seem, might human beings be considered "self-moving"—and even we appear incapable of a purely unconditioned motivation (despite the asseverations of Immanuel Kant). Thus, we understand self-motion to be not that of an uncaused cause, but rather, as a motion initiated from out of the **nature** of the being in question. This motion, as what the sign-relation evokes from the interpretant, is the aforementioned *reorientation*.
There are many diverse levels of such semiosis which can and have been observed and discussed at length: phytosemiosis, or that belonging generally to plant life; zoosemiosis, or that belonging generally to animal life; anthroposemiosis, or that belonging specifically to human beings; and even, in the suggestion of John Deely, physiosemiosis: a kind of semiosic re-ordering that does not occur *within* biological organisms but by the nature of dyadic and strictly brute relations can come to result in the reorientation of inorganic systems to foster genuine if only at first and difficult to discern nascent semiosic relations. But cutting across these diverse categories (excepting the physiosemiosic) one finds also a distinction between *endosemiosis* and *exosemiosis*. Endosemiosis was initially posited by Thomas Sebeok as that which "studies cybernetic systems within the body" and that "in this field the genetic code plays a role comparable to the verbal code in anthroposemiotic affairs", distinguishing it from the exosemiosic exchange of signs between living beings and their environment.

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and **final** interpretants (under which lattermost we comprise intermediate or non-ultimate **logical** interpretants as well), which notions we have discussed at greater depth elsewhere (Kemple 2019: *Intersection of Semiotics and Phenomenology* [*ISP* hereafter], 156-62).

[11] On the whole structure of sign-relations, see Deely 2015: *Basics of Semiotics* 25-126; Kemple 2019: *ISP*, 150-72.

[12] Peirce 1903: *EP*.2: 211.

In each case, actual semiosis entails necessarily that there is an act of *interpretation*—without an interpretation, one has merely *virtual* semiosis—that is, the aforementioned reorientation affected through the interpretant of the recipient being toward the object made present by the sign-vehicle. Notably, however, in this lattermost distinction, namely that between the endosemiosic and exosemiosic, the former does *not* have the object present to it as a something-other, outside the self, but only, rather, an input as received. The relation of semiosis in such cases does not transcend the individual—but, nevertheless, even within the organism, it results in what we can call an *interpretation*. Of course, this raises the question: *what is an interpretation*?

1.3. Meaning and Intelligence

It is a curiosity—one might even say a glaring, egregious oversight—that although diverse methods and approaches for interpretation are often advanced (such that many pages are filled with discussion of hermeneutics, or, within semiotics, distinctions concerning the nature and function of diverse interpretants), the precise meaning of the term *interpretation* is often left presupposed, or, perhaps, simply ignored. Without pretending to rectify this neglect, allow us simply, and provisionally, to state the meaning of interpretation thus: the rendering of an object according to a relation of **meaning**.

This, of course, raises the further question of meaning: what do we *mean* by *meaning*? As I have written elsewhere:[13]

> When we say the word "meaning", we typically mean one of three things: either we are indicating how something is to be understood, as when I ask about the meaning of a word; or we are asking about what a word or other sign indicates, about the object of reference; or we are indicating why something is important for something , as when I ask about what an item or an action means to you. These three senses – respectively, termed the intelligibility, referential, and teleological senses (the first two being indicated by the German terms of *Sinn* and *Bedeutung*, respectively) – are related to one another: if we are going to say that something is important to us, it has to be because of what we believe that thing is, in itself; if we have strong beliefs about what something is or what it means in itself, that strongly suggest it has some importance to us; and the entire framework of our experience of intelligibility and importance alike is constituted by references.

Most familiar to us in our contemporary world Is the *referential* sense: what this or that phenomenon "means" for a given individual or animal species, as well-encapsulated in Jakob von Uexküll's concept of the Umwelt. The sense of intelligibility permeates our specifically-human understanding, but escapes explicit objectivization itself, and the teleological accessible only by reflection upon the intelligible. By the "intelligible" we mean not only the mind-independently existing "real", but also and more fundamentally, that what is irreducible to those relations of reference: what we might call the progressive transformation of Peirce's dynamic into immediate objects.

If by the term "intelligence", therefore, we mean the capacity of *grasping the intelligible*, it would seem that human beings alone possess intelligence properly speaking. Predicating "intelligence" of non-human animals or plants—to say nothing yet of machines—would require some analogical or metaphorical proportionality in order that misunderstandings and equivocations not occur. And yet, such predication *is* apt: for, although they do not grasp the intelligible, plants and animals both *exercise* the patterns of that intelligibility in their respective referential interpretations.

[13] 2019: *ISP*, 19-20.

2. Autopoiesis and the Nature of Machines

Thus, we are left with three interrelated questions: first, are machines capable of a genuine autopoiesis? Second, are machines capable of genuine interpretation? And third, are machines in possession of intelligence, even if only at an extreme of metaphor? In this section, we will undertake to answer the first of these questions.

2.1. Defining the Machine

Throughout all its etymological roots and derivations, the contemporary English word "machine" retains the same primary significance: an instrument, or tool, which enables a greater efficacy than that possessed by natural capacities alone. Principally, machines have been instruments of mechanical force. In recent decades, however, with the creation of the computer and the increase of computing power, machine applications have increasingly been attenuated to increase of information-processing rather than mechanical efficacy.

To give an example of the increase in algorithmic sophistication, we can take ChatGPT-4 as an example. The "T" in "GPT" stands for the "Transformer" model: an algorithm which uses the self-attention or scaled dot-product attention mechanism, which converts input into positionally-encoded vectors subsequently weighted in a complex matrix of correlations indicating the fitting correspondence of the input data. When trained with a very large set of data, the analysis of vector points becomes increasingly capable of discerning and replicating fitting correspondences of these data in output. For instance, ChatGPT-4 can recognize nonsense strings of words as syntactically nonsensical, or, even if syntactically sensible but semantically incoherent, that there seems no well-patterned correspondence between the parts. Conversely, when it renders its own output, it uses the same process to discern which words follow most likely as responses to the input.

Correlative to the increase in processing power and algorithmic sophistication, information machines have resulted in phenomenon of which we will have to take stock not only in this article but more broadly throughout our contemporary cultural confusion: that of the "black box". A black box, generally speaking, is regarded as any complex system which operates upon observable input and delivers observable output, but the actual machinations of which remain opaque to human beings. We can tell whether they "work", but we do not know how. Increasingly, the machines which handle the information of our daily use operate as black box systems. LLMs are the prime example: trained upon enormous quantities of data and constituted from millions or billions of parameters, and lacking explicit rules for conducting interpretation, an LLM like ChatGPT-4 deduces probabilities at a speed far faster than can the human mind—conducting thereby a non-linear analysis of pattern-matching.

As these algorithmically-structured information-processing machines improve—not only through the input of human beings but through a recursive feedback cycle—it becomes tempting to impute an autopoietic constitution to their organization. Science fiction has long held our fascination by imagining machines that run wholly independent of human input, and, despite that independence, beginning their own development into increasingly sophisticated actions. These developments—not only in science fiction but in the factual improvements to "artificial intelligence"—indicate our vision of the line between the machine and the living becoming blurred.

2.2. Actions of Artificial Intelligence Processing

How should we define "artificial intelligence"? First, we must insist that the "intelligence" in this name be understood *strictly* as a metaphor: that is, an improperly proportioned predication, such that, though machines may perform actions that result in effects comparable to intelligence, they do not have intelligence essentially. We will return to this point in the fourth section of this article. Second, with this metaphorical provision in mind, we must recognize that the definition of anything *artificial* always and necessarily entails relations to *extrinsic* causes. Whereas in defining natural beings, we can rely upon their autopoiesis to exhibit definitive characteristics, the dependent nature of all things artificial entails that their meaning comes, somehow, from "without". One artificial product may, depending upon its own intrinsic properties, be put to a multitude of not only diverse but even contradictory purposes (as the doctor, knowing well these properties, may use medicine not only to heal but to kill).

Thus, third, we can state that the definition of "artificial intelligence" consists *principally* in the use to which it is *conventionally* put, and that, therefore, this definition may change as other uses arise. As of 2023, the primary use of machines and applications denominated as "artificial intelligence" is the mimicry of functions and tasks which ordinarily require human intelligence in order that they be accomplished. This mimicry, however, simulates only the *input* and *output* of the human domain: the nature of the processing itself occurs within a radically different framework not only from that of human beings but also from that of non-human animals as well. In many ways, we find a better parallel of artificial intelligence not among cognitive beings, but rather among plants. As Martin Krampen writes in his seminal 1981 article on "phytosemiosis":[14]

> The plant does not counter external impingements with the double-pronged operation of receptors and effectors, but uses the living sheet of cells of its casing to filter out relevant impingements. These relevant impingements are the meaning factors, i.e., the semiotic factors, for the living plant... plants do not have a "functional cycle" connecting receptor organs via a nervous system to effector organs. What plants have is a feedback cycle between sensors and regulators. In the absence of a functional cycle in plants, there is no way by which afferent signals can be fitted together with efferent signals to form the signifiers and signifieds of "objects".

What we observe in machines appears much the same: lacking true *receptors*—organs through which there are received and formed impressions beyond the merely physical datum impressed upon the organic body—plants are affected through their "casing" to receive "relevant impingements". Their lives are comprised within a strictly-indexical processing "dwelling shell" or "living enclosure", a *Wohnhülle*, as described by von Uexküll.[15] Thus, even though the operative capabilities of AI—given the mechanical possibilities with which it can be endowed, such that it may "infect" countless other systems—far outstrip anything known of plants, they occur within the same fundamental constraint.

2.3. Self-less Simulacrum

However, unlike plants, the machine lacks an internal principle of unity: it has no ψυχή making it to be at-work-staying-itself. It exists within an enclosure, to be sure. But it does not *live* within

[14] 1981: "Phytosemiotics" reprinted in Deely, Williams, Kruse 1985: *Frontiers in Semiotics*, 88.

[15] 1940: *Bedeuntungslehre*, 34.

an enclosure. That enclosed existence might continue even were human beings eradicated. An apparently "autonomous" artificial intelligence could continue acting indefinitely in the absence of human directives. But its unity remains bounded by an artificial constitution. The lone plant in an otherwise desolate expanse may have no consciousness, no distinction of itself from the world without, no awareness of others; yet it has a *self* nonetheless and works to remain that self, even if lacks the conditions necessary for its survival. The machine might continue to function in isolation, but that function does not belong to a self—and thus the function, as we will see, would be meaningless.

The machine has no *law of itself*; only laws of its parts. While it may be possible that, through artifice, there comes into existence some being that *does* possess a law of itself, it would **no longer be a machine**. Until such a time, the machine only presents a simulacrum of having an identity of selfhood. We can put avatars on ChatGPT; we could perhaps even animate it convincingly to look a person on the other end of a video call. But it would remain meaningless in the absence of a genuine interpretant.

3. Semiosis and Machines

To take up our second question—are machines capable of interpretation and therefore of semiosis—we might already answer, simply and directly, "no", based upon the previous analysis of their self-less way of being. That is, given that autopoiesis is a prerequisite character to the constitution of a self, and that interpretation is the assignment of meaning as either referential or intelligible, and that it begins from the referential, which always pertains to the self, it follows that the absence of autopoiesis entails an absence of interpretation. But we ought also to explain how machines give the *appearance* of interpretation; an appearance so strong that the word "interpret" ubiquitously is used in explaining machine processing.

Certainly, there appears a kind of "self-motion" in the activity of informational processing machines, especially LLM and GPT technologies. The organized storage and retrieval of data—algorithmically processed both with respect to input and output, revised and re-shaped over time through further algorithms which evaluate the results of that input/output—simulates the genetic code of a living organism which evolves, develops, and constitutes a kind of "habituation" of the entity. Stimulated by input, this data set and the derivation therefrom results in a processing that produces output seemingly as the unique product of that AI "entity".

How, then, does this simulated interpretation differ from the genuine interpretation performed by autopoietic beings? In short: genuine interpretation consists in the formation of genuinely triadic relations, whereas artificial intelligence processing merely concatenates degenerate triads conformed to pre-determined limits of output—interpretant frameworks—that allow the ready assumption into genuinely meaningful contexts. We will explain this in three stages: first, the degenerate triad; second, what we will call the digital blur; and third, the external constraints upon which the machine simulation of intelligence relies.

3.1. Degenerate Triads and Machine Learning

Though inexplicable apart from Firstness and Secondness, the Peircean category of Thirdness—the category of synthesis or unification, of relation itself[16]—consists in the *relating itself* between two (or more) beings, such that thereby is formed a governing habit. It is just this governing habit that machine-learning strives to simulate, and why it requires certain feedback loops of probability in order to affect this simulation. But no genuine Thirdness exists in the machine. Peirce states genuine Thirdness to consist in "*some active general principle*" which appears in the relating between two different things but is itself irreducible to things related, or to some third thing. As he explains:[17]

> With overwhelming uniformity, in our past experience, direct and indirect, stones left free to fall have fallen. Thereupon two hypotheses only are open to us. Either: first, the uniformity with which those stones have fallen has been due to mere chance and affords no ground whatever, not the slightest, for any expectation that the next stone that shall be let go will fall; or, second, the uniformity with which stones have fallen has been due to *some active general principle*, in which case it would be a strange coincide that it should cease to act at the moment my predication was based upon it.

In other words, all regularities follow along determinate general principles, each of which is a certain Thirdness. But the mere fact that regularity is *obeyed* does not mean that the beings themselves have Thirdness autopoietically *operative* in themselves. Rather, what semiosis can be discerned as present therein constitutes only a *virtual* semiosis, until such an entity comes along for whom Thirdness enters into an autopoietically-constitutive action.[18] Machine processing, indeed, is only a **degenerate** triad, what Peirce would call a mere concatenation of dyadic relations.[19] As an example of such a concatenation, hitting one billiard ball into another: the cue ball striking the eight causes the eight to knock into the six, and so on and so forth. That we may discern general rules of force and velocity—different expressions of Thirdness governing physical interaction—does not mean that the billiard balls themselves enact Thirdness of themselves; only that they, like all else, are subject to it.

When an animal "learns", what is it doing? In short: realizing the pattern of Thirdness which governs the particulars of its experience. When human beings learn in their singular manner, the Thirdness itself becomes discerned as an object of awareness. For animals, the Thirdness is realized *in actu exercito*; for humans, not only this, but also *in actu signato*.

By contrast, when a machine "learns", it obeys a certain Thirdness, but does not realize that Thirdness *in actu exercito* and a fortiori neither does it discern it *in actu signato*. Rather, they correlate different dyadic relations according to external constraints (see below). These correlations often occur not simply in a singular, linear concatenation, but incorporate a plurality of multidimensional dyads: such that one "node" in the network is dyadically related to plurality of other nodes, but between or over which there emerges no genuine Third. Their appearance of

[16] That is, though Secondness entails *relativity*, it does so on the part of subjects which are related: this is what the Scholastics, following Boethius in his commentary upon Aristotle's *Categories*, called the *relativum secundum dici*: not the relation itself as bearing a positive intelligibility, but the things as intelligible to us only through recognizing that relativity. Cf. Deely 2007: *Intentionality and Semiotics* in passim, especially chs.8, 11, and 12.

[17] 1903a: *EP*.2: 183.

[18] Deely 2015: *Basics of Semiotics*, 100-21.

[19] Cf. Peirce 1890: *EP*.1: 251-52; c.1896: *CP*.1.473; 1904: *CP*.8.331; Kemple 2019: *ISP*, 295-99.

"learning", not only in fact but *in principle*, consists of simulacra. We will turn to a causal account of how this appearance functions momentarily.

3.2. The Digital Blur

But first, it is important to recognize why, precisely, modern computer technologies not only present this simulacrum of learning convincingly, but deceitfully.

The atomistic digitization of data allows for storage, retrieval, and reconfiguration of increasingly-accurate representations of the mind-independent world. Regardless of the mechanism for this digitalization—bits or qubits or any other possible fundamental unit—the result consists in an ability to representationally mirror anything else which can be translated into algebraic and quantitative variables. Other communication media—analog forms of recording such as vinyl, print, film—are suited to limited ranges of representation. The digital, however, can translate seemingly any other instrumental vehicle of signification. On my desktop computer there are books, articles, music, movies, and more still. Video games demonstrate an increasing ability to become immersive simulations, especially with the development of virtual reality technology, which will soon be infused with artificial intelligence to produce non-scripted or generative events, interactions, and conceivably whole stories.

The breadth of digitally-translated representation first appears as a kind of "mirror" to the rest of the world: representing not only the mind-independent realities of physical entities, but also mind-dependent social structures and even hyperrealities. Yet the digital mirror is not inert. The presentational data of the digital are *instrumental* signs their significates. Like any instrument, therefore, it can be distortive *in itself* of the significate. However, unlike most instrumental signs, the atomistic nature of its constitution allows for near-infinite manipulation in the instrument itself. Infidelities to the mind-independent real can be subtle—escaping explicit notice—and yet impactful. Simultaneously, there can be presentation without any pretense to representation of that mind-independent real: pure fictions.

Importantly, however, those pure fictions are presented in *precisely the same manner as are represented mind-independent realities*. The only limitation upon a digital presentation is input. As the ability to improve the probabilistic correlation between dyadically related bits of data improves—through, ultimately, better-encoding laws of Thirdness into the algorithms of machine-learning systems—the ability to constitute fictitious presentations correspondingly improves. More perniciously, as this ability improves, our ability to discern between what *is* in itself as digitally represented and what the digital originally produces for presentation diminishes. Infusing this fictitious capacity for original presentation with the generative capacities of AI, if left unchecked, will likely produce a psychological backlash of profound consequence.

3.3. External Constraints and Interpretation

However, despite the degree of sophistication the algorithmically-processed simulacra might ultimately attain, it remains true that whatever significance attributable to any dyadic chain or network of relations[20] relies upon some external constraint *across which* it must be translated. I

[20] Notably, the changes rendered by purely dyadic relations *might*, over time, give rise to beings capable of themselves interpreting—this seems indeed the only possible way for evolution from inorganic to organic beings to occur. Cf.

mean here not merely the *output* of whatever digitized system, but rather the subsumption of these dyadic relations' results into some living being's realization of Thirdness. As a concrete example, without my presence—or a similarly-cognitive agent—the letters appearing on my screen as I type lack any completed meaning, for they lack an interpretant. This is not to say that the meaning comes into being *ex nihilo* from my observation of those letters, or words, or sentences. To the contrary, because they are brought into being from within a context of long-since customary signification, they are *virtually* semiosic, awaiting only an interpretant in possession of the capability to interpret them actively. So too any potential iconic or indexical sign-vehicles are signifying in act, even if there is no dative to whom they actively signify.

But such virtual semioses remain of themselves merely potential and therefore require some external agent that they be made actual, and, moreover, that *meaning*—understood as the autopoietic realization of semiosic interpretation, or we might say, the lived realization of Thirdness—comes to be realized. Unless there exists some initial input and some final output constraining the dyadic activity of any AI technology, regardless of how sophisticated its digital constructions may become, those dyads remain only virtually meaningful. To put this otherwise, the machine does not, of itself, constitute an interpretant. Rather, the "meaning" of machine actions requires an interpretative objectivization by some living entity.

4. Intelligence and Meaning

Thus, to turn to our third and final question: can machines truly have "intelligence"? As with the question of whether they engage in semiosis, we can, of course, quickly say "no" based on what has just been said. How could anything be called "intelligent" or said to possess "intelligence" if it does not constitute an interpretant?

This question, of course, demands that we more precisely define what it is we mean by the word "intelligence". As stated above (1.3), intelligence seemingly has something to do with the grasp of the intelligible—or, at least, with an autopoietic movement towards the meaningful. Thus, it seems to be a property of animal and human life.[21] For animals, intelligence consists in the realization of Thirdness in the referential context of meaning. Through this referential context, the cognitive action of the animal allows it to realize in itself meaningful action, even if it does not grasp that meaning precisely. By contrast, for human beings, this referential context is permeated by the possibility of attaining *intelligible* meaning.[22]

The discovery of intelligible meaning consists in a "semiosis beyond perception". It is worth listening to John Deely on this point:[23]

> Using signs in this species-specific way, the human animal is able to regard the object signified in its own right (albeit fallibly), that is, as it exists or fails to exist apart from the relations through which it is objectified. The ground of this possibility is also the source for what is distinctive in the human use of signs. For it would

Deely 1994: *New Beginnings*; 2001: "Physiosemiosis in the semiotic spiral: A play of musement" in *Sign Systems Studies* 29.1, in *passim*; 2015: *Basics of Semiotics*, 110-12.

[21] Phytosemiosic systems may move themselves in accordance with the meaningful, but arguably, not towards it. Cf Sebeok 2001: *Signs: an introduction* in passim; Deely 2007: *Intentionality and Semiotics*, 155-58; see also Deely 1971: "Animal Intelligence and Concept-Formation" in *The Thomist*, 35: 43-93.

[22] Thus the distinction which Deely often posited between the generically-animal Umwelt and the specifically-human Lebenswelt, as shown in the quote below.

[23] Deely 2002: *What Distinguishes Human Understanding?* 106-07.

> appear that what is first apprehended intellectually, insofar as intellection differs from perception, is the objective world in relation to itself. In this apprehension, the imperceptible "relation to itself" is the sole contribution of understanding [i.e., of distinctively human intelligence]. Yet this contribution is sufficient both to elevate the perceptible elements of the Umwelt to the level of intelligibility and, by the same stroke, to transform the generically animal Umwelt into a species-specifically human objective world, a Lebenswelt, an objective world perfused with stipulable signs apprehended as such in the heart of otherwise naturally determined significations.
>
> If this be so, then a neglected insight of the Latin scholastics would appear to be not merely insufficiently understood, but even central for semiotics, namely, their realization that the physical environment, insofar as it enters into the cognitive structure constituting an Umwelt, is of itself sensible but not of itself intelligible. Understanding itself, taking the materials of sensation and perception as its base, has to make that material actually intelligible. The understanding does this by first seeing the whole material of perception – the objective world or Umwelt in all its parts – in relation to itself, over and above the relations to biological needs and interests which are already factored into the structure of the Umwelt by virtue of the evolutionary heritage of the cognitive organism. Hence the objective world, seen in relation to itself, already consists of a mixture of mind-independent and mind-dependent relations undistinguished as such but structuring all particular objects.
>
> …*Ens ut primum cognitum*, "Firstness", does no more than establish the foundation for the eventual arising of questions of the form, "What is that?" Here is the point of transformation whereat generically animal Umwelt becomes species-specifically human Lebenswelt.

While there is no question that animals learn—and, we could say, any evolutionarily-developing organisms likewise, not as individuals but across the transgenerational mutations whereby they adapt better to given environments—it does seem that "intelligence", properly speaking, consists precisely in the ability to ask, "What is that?" A machine may be constituted to seek means for categorizing the input it receives; it may even be structured to seek out new data of its own, without requiring an external agent to provide it with input. But the asking of the question "what" consists not in seeking data; it consists, instead in pursuing some Thirdness, i.e., the answers first to the question "what" and second to the question "why".

There is no doubt that AI can be of benefit to human beings, even in the improvement and refinement of our intelligence. Well-designed AI applications can be employed to filter the ever-increasing quantity of information produced and shared across global networks of communication. It is already far better-suited for pattern-recognition—fine-tuned as it is to the correlation of nodes in dyadic relations—than most if not all human beings. It may genuinely profit the advance of human life. As Thomas Sebeok once wrote in a rather brief note:[24]

> Machines will thus become not merely the agents of evolutionary change—in some measure they already have—but also the very loci for what Peirce has called "the essential and fundamental varieties of possible semiosis," which, as he also foresaw, "need not be of a mental mode of being."

But, while it is always suspect to contradict a man as eminent and sagacious as Sebeok, and though it is possible, no doubt, that machine technologies could in fact develop to the point of becoming somehow autopoietic; that they could indeed begin their own evolution—though they would, at that moment, cease to be machines. Any "machine" which seeks out its own organization, which pursues *meaning*, even of a strictly referential kind, no longer qualifies as a machine. However,

[24] 1989: "Semiosis and Semiotics: What Lies in Their Future?" in *A Sign is Just a Sign*, 99.

as incorporated *into* life, machines may accelerate the development of those lives. A critical concern, however, is whether this incorporation results in *outsourcing* certain tasks integral to life's proper development to the more-efficient machines.

This has already proven a temptation: many younger persons, raised with smartphones in their pockets, have shown an underdevelopment of memory.[25] More poignantly, I believe the rapid accessibility of ready-at-hand information has fundamentally damaged our ability to form good questions, to engage in the search for meaning, and, indeed, the discovery of new meaning.

5. Conclusion: The Danger of Lost Meaning

The opaque workings of "black box" artificial intelligence systems already have and will increasingly cause a different kind of hyperreal environment than those described by Baudrillard or Eco. These latter describe a perceptual falsity that comes to be accepted as a "new real". Disney World is rife with appearances that are fake, that we know are fake, that we accept as constituting a distinct "reality": socially-constituted and unresolved to mind-independent being, but "real" because of its effect upon us, because of how we are immersed and integrated within their simulacra of something coherent. The same hyperreality comprises not only our explicit fictional universes, but so too the way in which our all-encompassing media environment distorts our sense of history.

Artificial intelligence does something different. The constitution of its hyperreal will not consist in the propping up of a mind-dependent socially-constituted universe of perceptual entities—movies and television, theme parks and re-imaginings of history, a fabricated universe that we *know* is unreal but accept because of the cohesion of its perceptual presence—but rather a certain *intellectual* falsehood.

Within a society permeated by artificial intelligence, it will not be the *environment* about which we are deceived.[26] It will be *ourselves*. Indeed: it already is. Alan Turing's infamous test bears witness to this deceit: for, "Turing suggests that if a machine passes the test, then it would be unreasonable to deny humanity and intelligence to it. This implies that 'intelligent behavior' is not only the criterion for 'intelligence,' but also the definition of it."[27] We reduce the experience of our own operations—our own distinctive intellectual being—into the epiphenomenal presentations of it. We *know* the AI chatbot is not *really* thinking in the same way we are; we know it has no "subjective experience", no consciousness, no experience of qualia. It will even

[25] Rowlands et al., 2008: "The Google generation: the information behaviour of the researcher of the future", *Aslib Proceedings*, 60.4: 290-310. Sparrow, Liu, Wegner 2011: "Google Effects on Memory: Cognitive Consequences of Having Information at Our Fingertips", *Science*, 333.6043: 776-78. Makin 2018: "Searching for digital technology's effects on well-being", *Nature*, 563: S132-S140.

[26] Which is not to say that further deceptions concerning the environment will not be enabled by AI; indeed, such is already happening. Cf. Davidson 2021: "Travels in Hypervirtuality" in *Semiotics 2020/2021*, 143-62. As Davidson writes, 157: "the hyperreal is that layer of digital information that we do not recognise as digital. The filtered, edited, staged Instagram photo or the algorithmic presentation of news articles and shopping recommendations is hyperreal to the unsuspecting user… But suppose we wish to speak to a human at the bank rather than the AI assistant? We ask for the customer service representative, and we speak with a human over the phone as represented by their avatar. They assist you with your problem. This stems from a desire to return to the human-to-human interaction with a voice and a face that you interpret as human. However, in the future—Web 3.0 era—how do we know that the avatar and the voice was of a human being, not a virtual one?"

[27] Engelmann 2017: *Nature and the Artificial*, 152.

tell us so itself. But we begin to lose our own sense of *really experiencing these realities* through living in a world increasingly constituted by the semiosic-simulacrum of machine constitution. The machine, as seen above, exists itself only within an internal pattern of complexly concatenated and cross-referenced dyadic relations. We, shaping our communication through the feedback cycles of the machine, are in danger of being caught within this web inauthentically simulating significance, remitting our remaining grasp of a mind-independent real.

To give an example of this, as an experiment, I submitted large sections of this paper to ChatGPT-4 and asked it to evaluate the writing. With each positive comment it returned, I found myself, almost involuntarily, experiencing a positive affect. It offered praise of the nuance, the sophistication, the concision, the accuracy of how I depicted artificial intelligence and LLM/GPT alike, and the application of Peircean semiotic thinking to the question of these technologies.

But is praise of our work from something incapable of understanding meaningful praise at all? Does not the convincing simulation of praise—even known as simulation—not alienate us from reality?

There exists no semiosis within the machines. But we, the more we operate within the confines imposed upon those machines—those confines within which the operations of the machines can be designated as meaningful—the more our own semiosis becomes confined, too. If we entrust the machine to speak for all things, we will lose the ability to hear things that speak for themselves.

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