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Naturalism? What Naturalism?*

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"Homo sum, humani nihil a me alienum puto",[†]

Terence, *Heauton Timorumenos*, 163 BCE

I am grateful to the APA Committee on Prizes and Lectures for offering me the Romanell prize. I confess to having been quite surprised as I don't see myself as actively participating in debates about naturalism in philosophy. And yet I have said about my approach in epistemology and philosophy of science that is naturalist (in a sense that means something to me). So I saw and see the prize not as an acknowledgement of any contribution I have made to the philosophical discussion of naturalism, but a challenge to make good on this self-assessment. I approach the task with gratitude tinged with some wariness. What could naturalism in philosophy be? And, is there a form of naturalism that I could claim as also mine?

My talk today will be divided into three parts. The first addresses that first question: what could naturalism in philosophy be? The second reflects skeptically on the prospects for one common understanding of naturalism in philosophy: that science be the source of answers to philosophical questions. The third proposes a naturalism without science.

Part One: Naturalism as Opposed to What?

To answer this question, I consulted both philosophical and lexicographical sources. Both the *Stanford Encyclopedia of Philosophy* entry on "Naturalism"¹ and that on "Naturalism in

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<https://www.apaonline.org/global_engine/download.aspx?fileid=9C08E47C-77CB-4608-B1BC-7A6A835FBEF9&ext=pdf>.

My thanks to Ken Waters for introducing me and for chairing this session.

[†] "I am human, I believe nothing human to be alien to me."

Epistemology”² give excellent, if noncommittal, surveys of naturalism, but offer nothing that could be attached to any view I hold (apart from a brief reference to my socializing moves in the epistemology entry). Dictionaries were revealing in the manner of their unhelpfulness.

Most dictionary entries for “naturalism” and “natural” devolve the burden of definition to “nature,” whose definition in the *Oxford English Dictionary* has eleven entries, each of which has multiple subentries, and only one of which is relevant to philosophy. A significant number of definitions of “naturalism” define by negation, by stating what naturalism abjures. In philosophy, we often sign onto an “ism” to signal what we are not. If I’m a realist, you can’t charge me with relativism or constructivism, if I’m a constructivist, you can’t charge me with realism. I suspect that some of that signalling function persists in implicit or covert ways in more explicit discussions. I have learned from feminist analyses of gender that terms entering into contrast relations (like male/female/ feminine/masculine) are rarely adequately understood as standalone categories or concepts and in many cases it is the intended contrast that is doing much of the work. So part of this initial investigation includes considering some of the contrasts into which naturalism (or nature) enter. I think that there is a stickiness or residue of some of the contrasts that make some possible naturalisms less salient than they might be. .

The online *Oxford English Dictionary* offers four definitions of “naturalism”

1. *Ethics*. Action arising from or based on natural instincts, without spiritual guidance; a system of morality or religion derived only from human reason and having no basis in revelation.
2. *Philosophy*. The idea or belief that only natural (as opposed to supernatural or spiritual) laws and forces operate in the world; (occasionally) the idea or belief that nothing exists beyond the natural world. Also: the idea that moral concepts can be analysed in terms of concepts applicable to natural phenomena. Cf. naturalist *n.* 2a.
3. A style or method characterized by close adherence to, and representation of, nature or reality.
4. Adherence or attachment to what is natural; indifference to convention.³

Contemporary meta-ethicists might have fun with the first of these, but it's the second that purports to define philosophical naturalism. Unfortunately, any positive account of naturalism in any of these definitions simply refers us to "natural," so that's not much help. The contrasts are with the supernatural, spiritual, or revelation (presumably divine) so they do not narrow the field for naturalism in any useful way, and the fourth contrast "convention, seems, without context, a change of subject.

The *Random House Webster College Dictionary*, offers three definitions of naturalism, the one pertaining to philosophy reading:

Philosophy.

1. the view of the world that takes account only of natural elements and forces, excluding the supernatural or spiritual.
2. the belief that all phenomena are covered by laws of science and that all teleological explanations are therefore without value.⁴

The second definition is consonant with definitions from other sources (and with the elaborations in the *Stanford Encyclopedia*) and adds a further contrast, teleology. The first definition is similar to the OED offerings and shares with the *OED* the feature of passing the buck to "natural." Both define "natural" in terms of "nature." To get clearer on what "naturalism" means, we must go to "nature." And, "nature" in the OED has multiple definitions, each of them with many subheads. Finally, the 11th definition says of nature that it is

- a. The phenomena of the physical world collectively; *esp.* plants, animals, and other features and products of the earth itself, as opposed to humans and human creations.⁵

So, the contrast terms to natural or naturalism include "supernatural or spiritual"; "convention"; "humans and human creations"; teleology or purposefulness. Should we understand these as close to synonymous or at least in a relation of family resemblance? Simon Blackburn's *Philosophical Dictionary* confirms the confusion. Of "nature" he says: "An indefinitely mutable term, changing as our scientific conception of the world changes, and at best seen as signifying a contrast with something considered not part of nature." He goes on,

Contrasts with nature may include

- (i) that which is deformed or grotesque, or fails to achieve its proper form or function, or just the statistically uncommon or unfamiliar;
- (ii) the supernatural, or the world of gods and invisible agencies,
- (iii) the world of rationality and intelligence, conceived as distinct from the biological and physical order
- (iv) that which is manufactured and artificial, or the product of human intervention;
- (v) related to that, the world of *convention and artifice.⁶

The third of these actually expresses a substantial philosophical thesis, severing rationality and intelligence from the biological and physical order. And notice the association of the fourth, “manufactured and artificial or product of human intervention” and the fifth “the world of convention.” The contrasts can be summed up in a table:

Non-Natural	Natural
Rationality and intelligence	Biological and physical order (add psychological?)
Artifice	Covered by the laws of science
Convention	
Constructed	
Supernatural	
Teleology/purpose	

From this review of lexicography, we can extract two definitions of naturalism: 1) a view of the world that takes account only of natural elements and forces, presumed to be biological and physical (material) entities and their processes) and that abjures explanation by appeal to the supernatural, divine, or whatever transcends the domain of the material. 2) the view that all phenomena are covered by the laws of science. If we treat these as meaning the same thing, we assume that scientific inquiry is sufficient to account for all the elements and forces

belonging to the biological and physical order. This is surely an aim of scientific inquiry, but it is not clear that we should adopt the assumption. If we take the contrasts seriously, the biological and physical world, (the material world) and the referents of the terms on the non-natural side of the ledger belong to mutually exclusive domains. Naturalism as defined in the second definition, presupposes that the shape of scientific content is such to enable the provision of scientific content to philosophical theses. In Part Three, I will suggest that the distinction between the Natural and the Non-natural, in particular the association of the candidates for non-natural with each other simply by being contraries to the same category, limits our understanding of what philosophical naturalism could be. But, first I will explore what is possible if we let ourselves be guided by these definitions.

Part Two: Deference to Science?

I am interested in the concept, *knowledge*. Scientific knowledge has been my primary object of analysis, but to think about scientific knowledge, one must also think about knowledge in general. Naturalized epistemology refers to a collection of efforts to take *knowledge* out of the realm of the non-natural and into the natural. By the division above, to naturalize epistemology is to show that it is either an element of the biological or physical order or that whatever processes give rise to knowledge are themselves forces or processes of the biological and physical order (governed or described by biological or physical laws).

Hilary Kornblith has pursued the first of these strategies in his claims that knowledge is a natural kind: "Cases of knowledge, on this view, constitute a natural kind, and epistemology is the empirical study that investigates its properties."⁷ One finds out the actual contours of this kind by starting with some paradigmatic instances, identifying what they have in common, and then classifying or reclassifying other candidates by reference to the properties of those paradigmatic kinds. The strategy is much like a strategy one might pursue with chemical elements: identify some paradigmatic samples of, say uranium, and then determine for other radioactive elements whether they share the same atomic structure. [And, we know with uranium and other elements, that different isotopes can be discovered, so the empirical investigation yields multiple categories.] There has been much discussion of Kornblith's

proposal.⁸ My reservation has to do with the notion of discovery that is relied on. In the case of metals or other standard candidate natural kinds, we encounter something in nature, find out whether it is artifactual or accidental and, if not, find similar instances and then classify them on the basis of shared characteristics. Knowledge is not something like lead or helium we discover out there. We identify the paradigmatic cases of knowledge based on our conception of what knowledge is. Any disagreement about that conception will not be resolved by finding paradigm cases, as their identification as cases already depends on the conception we bring to bear.

More promising is to think about the norms and standards that govern our identification of candidates as knowledge or not knowledge. Here the ur-philosophical view is that expressed by W.V.O. Quine in “Epistemology Naturalized”: “Epistemology, or something like it, simply falls into place as a chapter of psychology and hence of natural science.”⁹ There are different possible interpretations of this statement. The standard one is that the norms are psychological and, ultimately, brain processes subjectively understood as norms. Closely related is the more evolutionary view that the norms are simply the processes that enabled our ancestors to survive more successfully than their conspecifics, hardened into norms by natural selection. However understood, this proposal, too, has received much attention, and many efforts to adapt the ideas. My response is the same as Richard Grandy’s: “One question I want to press is which chapter of what psychology epistemology is to become?”¹⁰

Grandy wrote that in 1994. In 2021, one can only echo the French: *Plus ça change, plus c’est la même chose*. Grandy surveyed the possible candidates that could serve as the chapter, and pronounced them as yet too immature and unable to answer the skeptical question: Am I a brain in a vat? All of the candidate sciences have made great strides forward since then. What are those sciences? And have the strides they have made enable epistemology to fall into place as one of their chapters? The sciences currently investigating knowledge and cognitive processes include:

Artificial intelligence that hopes to model cognitive processes

Cognitive psychology that hopes to provide descriptions of human cognitive processes

Neuroscience that hopes to characterize the material processes that carry out those cognitive processes

Cognitive Anthropology that studies how humans in communities create knowledge (or come to accept representations of the world that suffice for their purposes)

Sociology that studies how human groups develop and accept representations (that they will call knowledge).

There are two distinct problems facing the hope that these could essentially replace philosophical epistemology:

1. There's no sign of convergence among these, so Grandy's question, "which psychology" remains.
2. Either the strides forward in a given discipline still don't connect to human doxastic or epistemic states or there are multiple approaches in a discipline that seem non-reconcilable or that make substantive assumptions, in which case Grandy's question, "which chapter?" also remains.

To press this case, let us look at a few of the candidates:

Artificial Intelligence research. Artificial intelligence researchers are not united around a single goal. Is or should the point be to create a machine that can perform better than humans at a given cognitive task (e.g. play chess, diagnose disease)? Or is it to create a machine that models actual human cognitive processes. If the latter, should we follow the chapter that is logic based or the non-logic based chapter? This, of course, depends on what we already think about human cognitive processing.

What about machine-learning? The algorithms that the machine develops are inaccessible to the researchers, so we won't learn about their process let alone human cognitive processes from them. AI, then, unless it undergoes a major unifying transformation, is not a candidate, and were it to develop a chapter dedicated to philosophical questions, would not replace philosophical epistemology, since it would be riddled with philosophical assumptions.

Neuroscience. This is another area of research that has seen enormous progress in the last decades, but the progress is not towards a unified understanding of the functioning of the

brain, but in the proliferation of research areas and approaches. Neuroscience, like artificial intelligence research, is characterized by a major distinction between research that seeks to understand how the brain actually works and research that seeks to build systems that can perform tasks that the human brain performs. The former, neural systems research, seeks to model the brain and nervous system's processing, storage, and transmission of information. Neural network research, on the other hand, builds algorithms that mimic the operations of a human brain to recognize relationships between vast amounts of data. Such networks are used in a variety of applications in financial services, from forecasting and marketing research to fraud detection and risk assessment. Neural network research is a form of artificial intelligence research, but just because there is an intersection between some AI research and some neuroscience research doesn't mean that the two fields are converging. A certain amount of philosophy of neuroscience research is devoted to understanding the relationship between the models of computational neuroscience and the models developed on the basis of imaging of actual brains.

Neuroscience harbors further partitioning. If we ask, what is the functional unit of the nervous system, different research programs will give us different answers. I give examples of reports from two different laboratories.

Science Daily reported on work at the Callaway lab at the Salk Institute:

The researchers used imaging technology combined with genetically expressed sensors to study the function of thousands of individual neurons involved in processing color and shape in the primary visual cortex. During long recording periods, roughly 500 possible combinations of color and shape were tested to find the stimulus that best activated each visually-responsive neuron.

The team found that visual neurons selectively responded to color and shape along a continuum -- while some neurons were only activated by either a specific color or shape, many other neurons were responsive to a particular color and shape simultaneously, contrary to long-held notions about how visual processing works.¹¹

Taking advantage of the enormous advances in imaging technology, this team investigates how individual neurons respond to color and shape. The presupposition is that individual neurons are the functional units and that study of their behavior will reveal how the brain accomplishes everything the brain accomplishes.

Gerald Edelman and Vernon Mountcastle proposed in 1978 that the cortex was arranged into neuronal groups, themselves structured as columns (fn *The Mindful Brain*) and that these were the functional units of the cortex.¹² One might think that the greater resolution afforded by the kinds of techniques employed by the Salk lab would have left neuronal group theory behind. Instead it has simply facilitated greater detail about the structure of the groups.

When we examined the network topology of connectivity between neurons, we found that the neurons cluster into small world networks that are not scale-free, with less than 2 degrees of separation. We found a simple clustering rule where connectivity is directly proportional to the number of common neighbors, which accounts for these small world networks and accurately predicts the connection probability between any two neurons. This pyramidal neuron network clusters into multiple groups of a few dozen neurons each. The neurons composing each group are surprisingly distributed, typically more than 100 μm apart, allowing for multiple groups to be interlaced in the same space.¹³

Will the brain be parsed into single neurons or into neuronal groups or will researchers find that both constitute the functional unit in different contexts? Whatever the case, as sophisticated as the neurosciences have become, neither neuroscience as a whole, nor any of its subdisciplines can qualify as the scientific replacement of epistemology. As neuroscience progress, it will undoubtedly reveal, describe and explain, the cognitive processes of cognitive agents, but this does not yet fully incorporate or eliminate the normative dimensions of philosophical epistemology.

Cognitive Psychology. Turning to cognitive psychology, we find research on memory, on perception, on attention, on reasoning. And, here, too, we find many “chapters” from which to choose.

Just focusing on reasoning, we find not only many divergences, but different kinds of divergence. One has to do with conceptions of how reasoning actually proceeds, with researchers in *mental model theory* seeking evidence that deductive reasoning is based on imagistic thinking, while the advocates of *mental logic theory* have tried to prove that it is based on verbal thinking.

Perhaps the theoretical dispute most familiar to philosophers has to do with the status of reasoning about probabilities. Daniel Kahneman and Amos Tversky claimed that experiments showed that humans, even those with knowledge of statistics and of probability theory, quite generally fail to reason correctly, instead relying on biased processes, that they called heuristics, that frequently led them to the wrong conclusions to problems posed in experimental settings. Kahneman explained their work in the introductory remarks of his 2002 Nobel lecture:

Our first joint article examined systematic errors in the casual statistical judgments of statistically sophisticated researchers (Tversky & Kahneman, 1971). Remarkably, the intuitive judgments of these experts did not conform to statistical principles with which they were thoroughly familiar. In particular, their intuitive statistical inferences and their estimates of statistical power showed a striking lack of sensitivity to the effects of sample size. We were impressed by the persistence of discrepancies between statistical intuition and statistical knowledge, which we observed both in ourselves and in our colleagues. We were also impressed by the fact that significant research decisions, such as the choice of sample size for an experiment, are routinely guided by the flawed intuitions of people who know better. In the terminology that became accepted much later, we held a two-system view, which distinguished intuition from reasoning. Our research focused on errors of intuition, which we studied both for their intrinsic interest and for their value as diagnostic indicators of cognitive mechanisms.¹⁴

On the other side are Gerd Gigerenzer and his colleagues, according to whom, heuristics are not faulty or biased rules. They are instead strategies that selectively ignore information to make decisions faster, more frugally, and/or more accurately than more complex methods. (e.g. calculating probabilities). Instead of treating rationality as the following of content neutral rules, and the study of rationality as the study of such rules (for example formal logic) Gigerenzer proposes what he calls “Ecological rationality.” The study of ecological rationality investigates in which environments a given strategy is better than other strategies “(better—not best—because in large worlds the optimal strategy is unknown)”.¹⁵

And, for good measure, here is a philosopher, who, after severely criticizing the Kahneman and Tversky approach, advocates not finding an alternative (of the sort Gigerenzer proposes) but doing more philosophy:

“contrary to some of these critics, I do not think that alternative approaches to studying decision-making should necessarily come up with alternative concepts of rationality (such as ecological rationality proposed by Gerd Gigerenzer—see e.g.: Goldstein and Gigerenzer 2002). Instead I suggest that we need more philosophical scrutiny in uncovering the presence of value commitments, such as commitments to notions of rationality, and in understanding their epistemic role in research ...”¹⁶

It’s worth considering these examples. As philosophers, we are often seduced by the beautiful empirical work performed by our colleagues in the various relevant sciences. We meet one beautiful set of experiments, drop our professional wariness, and proceed as if the beautiful work is not just true but comprehensive. But the proliferation of research approaches with their different presuppositions shows that Grandy’s question is as appropriate now as it was 25 years ago. Don’t get me wrong, I think there’s lots of wonderful science being done in all these disciplines and in their chapters. They just don’t begin to give us an integrated story of how humans process information, how we reason, how we know, let alone provide a connection to epistemological norms. And, as Malecka points out, even if we were to eschew the philosophical questions proper to (philosophical) epistemology, sorting through these

different potential candidates, understanding the assumptions and values built into them requires philosophical analysis, so philosophy is not eliminated.

Part Three Naturalism without Natural Science

It's hard to know whether the definitions of naturalism found in the dictionaries are culled from philosophical practice or statements or whether philosophical thinking about naturalism follows lines laid down in the dictionaries. I think it actually runs both ways. In any case, I suspect the distinctions marked by the dictionaries have had a limiting, if not actually pernicious, effect on philosophical thinking, closing off possibilities of analysis. In my naiveté twenty years ago, I claimed for myself a naturalist identification based not on the thought that knowledge was a natural kind or that knowledge could be accounted for by the laws of science, whatever they are, but on the thought that the subjects of knowledge, the cognitive agents we are, are empirical subjects. "The approach I take in this book is naturalist in the sense that it treats the conditions of knowledge production by human cognitive agents (empirical rather than transcendental subjects) as the starting point for any philosophical theory of knowledge."¹⁷ (I probably should have said "my philosophical theory") As human, empirical subjects, we are limited ("bounded" as Herbert Simon put it), embodied (spatially and temporally located), become endowed with particular sets of points of view, values and norms as we progress through time and space ("experience"). Our limitations, forms of embodiment, perspectives, values and norms change as we go through life.

Secondly, I took "knowledge" to be a status term, ascribed to psychological states like beliefs as well as to their content, for example, when we talk about scientific knowledge (possessed by all and by none in particular). So, knowledge is not something out there to be discovered, like gold, helium, polonium, goldfinches. And, its properties are not to be discovered by examining samples, whether of psychological states like belief or of content like science textbooks.

I went on:

A philosophical theory of knowledge spells out the conditions that our use of the term "knowledge" indicates must be satisfied for correct ascription.

Neither purely descriptive nor purely prescriptive, it requires a characterization of empirical subjects and of the situations in which they seek to produce content that has the status of knowledge. This is descriptive. And it involves a characterization of the conditions satisfaction of which they take that status to imply, that is, a spelling out of the prescriptions implicit in the ascription and withholding of that status.¹⁸

In this regard, “knowledge” is like other status terms. For example, the value of a piece of currency is not fixed by the natural processes that give rise to the physical item, whether special paper made with certain kinds of fiber, or metal given a particular shape, but by being assigned a value by an entity entrusted with the authority to do so (the Federal Reserve or the Treasury). Because the value of the piece of currency does not flow from the elements and processes that went into the making of the particular physical item, we say its value as a medium of exchange is fixed by convention. Could the conditions satisfaction of which confer on a candidate the status of knowledge be conventions?

The contemporary philosophical discussions of convention descend from David Lewis’s *Convention*.¹⁹ Lewis says:

A regularity R in the behavior of members of a population P when they are agents in a recurrent situation S is a *convention* if and only if in any instance of S among members of P ,

- 1) Everyone conforms to R ;
- 2) Everyone expects everyone else to conform to R ;
- 3) Everyone prefers to conform to R on condition that the others do, since S is a coordination problem and uniform conformity to R is a proper coordination equilibrium in S .²⁰ p. 42

Put a bit differently, a convention is a regularity that holds in a group such that everyone expects everyone else to conform to the regularity/convention, and it is to the benefit of each member of the group that all members conform to it. The second clause is important. It, together with the fact that universal conformation benefits each member, is what entitles

others to criticize a member who does not conform. Lewis says that conventions are solutions to coordination problems. What are coordination problems? They are situations in which two or more agents must choose among a set of options, one among those options being an equilibrium solution, i.e. a solution in which each agent does the best they could given the choices of the other agents. Lewis is forthright about his reliance on game theory, and indeed much of the book is expressed in the language of the theory of games of coordination (such as prisoner's dilemma). The challenge is to identify the rational choice for participating agents, understood as the choice that has the greatest probability of a positive outcome for the agent (not the choice of the highest outcome for the agent). I will not go any further into the details of game theory. The important point is that the agents of game theory are empirical in at least the sense proposed by Simon, namely their rationality is bounded, meaning they do not have access to complete information. In particular, they do not know how the other agents will choose.

The agents in Lewis's theory and in the proposals of game theoretic solutions to other puzzles, such as the evolution of signaling or of the social contract ²¹ are trying to find solutions to a common problem in isolation. What they don't know is what other agents with whom coordinated action will yield a good solution for all believe or intend about the situation they share. Identifying the rational choice for individual agents in these situations does indeed constitute an interesting intellectual puzzle, but it fails to take advantage of the full range of properties of empirical subjects.

In my work exploring an alternative to standard accounts of scientific objectivity and, by extension, scientific knowledge, I argued that the limitations of sense and reason, of point of view, of particular values are overcome by the sociality of empirical subjects.²² Those limitations have a classic counterpart in scientific reasoning in the problem of underdetermination. The dependence of evidential relations on background assumptions generates the question: how can we ascertain that the background assumptions we knowingly or unknowingly rely on are worthy of that reliance? The answer I offered was that this assurance comes through the survival of those assumptions in critical discursive interaction, carried out in situations satisfying certain conditions. My associated claim was that the

standards that regulate critical interaction are themselves the outcome of critical discursive interactions. To me this meant that the standards, at least some of which I am happy to call norms, have the status of conventions. They are conventions in the sense that they are rules that emerge in the course of community interaction that individual members hold one another accountable to. They have no status apart from the community's agreement to abide by them as means to satisfying a common goal. But this understanding of convention and of the conventional status of our epistemic norms violates the ground rules of Lewisian convention and standard game theory accounts of conventions. They are solutions to coordination problems, but they are not solutions individual agents identify through calculating probabilities and expected utilities. In the game theoretic literature, these can be identified by the theorist, but there is no guarantee that individual empirical subjects confronting a dilemma will find their way to them. They need more information to do so.

So, must I find another way to describe the status of the standards that are a part of my account of scientific knowledge or is there something problematic with the Lewisian approach to convention? I think I'd rather say that the Lewisian approach to convention, and the game theoretic analysis of social phenomena is insufficiently naturalistic. The agents of game theory differ from the traditional agents of epistemology only in having limits placed on the inputs to their reasoning. If we are going to be naturalists (and I am not assuming that Lewis and his followers claim that identification), we ought to be able to take advantage of the full range of human features, our limitations, the value-ladenness of our points of view, yes, but also our resources, especially our sociality, our ability to communicate with others in order to overcome those limitations and together arrive at more robust solutions to common problems. In this attitude, I am encouraged by a passage from an essay by the philosopher Cristina Bicchieri, herself a practitioner of game theoretic analysis. Much of Bicchieri's work has involved identifying additional conditions agents must satisfy, assumptions, information, or norms they must carry into the dilemma in order to arrive at a satisfactory solution, but in the essay "Covenants Without Swords" she discusses a particular set of experiments.

One variation in social dilemma experiments, which dramatically increases cooperation rates, is allowing subjects to discuss the dilemma. [My emphasis]

There are two possible explanations for this “communication effect.” One is that communication enhances group identity, the other that communication elicits social norms. I argue that the reason for this departure from normative rational choice is the working of norms; if correct, this conclusion has important strategic implications for institutional design and public policies that encourage social cooperation.²³

So, when real agents are put into coordination game situations, better results come from allowing the agents to communicate rather than seeing what it takes for them to accomplish the results calculating machines say are best for them. I think this may be surprising only in the context of the conceptions of nature and naturalism built into the definitions reviewed in Part One. As noted, some of the contrasts in those definitions already have philosophical assumptions built into them, in which case we ought not feel constrained to conform to them. When we treat ‘natural’ and ‘nature’ as having single unified meanings, their contraries acquire a stickiness, each one bringing the others along, constituting a reservoir of meaning that haunts the concept of nature and the natural that opposes them to the products of human agency. This residue conjoins

The statistically anomalous

The world of supernatural or invisible agencies

The world of rationality and intelligence (conceived as distinct from the biological and physical order)

That which is manufactured or artificial, or the product of human intervention

The world of convention and artifice

When brought out of the shadows, the reservoir dissolves. There is nothing supernatural or statistically anomalous about the agreements emerging from those interactions that stabilize our representations and inferences; and the world of rationality and intelligence conceived as distinct from the biological and physical order becomes unmoored from reality, and not the intelligence of the empirical subjects whose capacities and aspirations I claim ought to be the subject matter of epistemology. Empirical subjects have limitations, but they also have

productive capacities. Neither symphonies nor scientific theories would appear in the natural world without humans to create them, but this does not push them into the world of the supernatural or non-natural. At the same time, there is a difference between a mountain produced by movement of the tectonic plates or the upwelling of magma from inside the earth and a mountain made for Disneyland; or between curative herbs picked from field and forest and chemical compounds produced in a pharmaceutical laboratory.

My point is that the line between the natural and the unnatural gets drawn improperly when the reservoir of meaning loaded into the contraries is not attended to. Those contrasts impart different meanings to “natural,” different reasons to use the concept. Sometimes we mean a contrast between the world of biological and physical matter and forces on the one hand and something else supposed to transcend or exist beyond that world on the other. Sometimes we mean a contrast between what we humans discover in that world and what we make. There isn’t a single definition of “natural” that can guide our philosophical reflection. Where some reflection has missed opportunities is in conflating the multiple contrasts to the natural as belonging to the same category, placing human intelligence and creativity in the same category as the supernatural or the transcendent, placing the conventional in the same categories as artifice or the supernatural. Efforts at apposite characterization of nature, natural, or naturalism are hampered by the stickiness of the contrasts.

There is a way to read the definitions less as definitions than as reflecting two motivations for pursuing a naturalist program in philosophy. One is dissatisfaction with a priori theorizing that treads unwarrantedly on the empirical. Something like that stands behind Quine’s famous dictum and the efforts to naturalize epistemology by treating its subject matter as more appropriately addressed by one or another of the sciences. But the sciences are not ready to take on this task, and epistemological reflection guided by various underlying metaphysical commitments persists. Another is a wish to detach the philosophical from the theological, to separate the human from the divine, to avoid recourse to the suprahuman in engaging in that epistemological reflection. This ambition, however, need not be concerned with generating claims about what there is, but can instead be understood as a stance towards philosophical reflection, a stance that centers the capacities and limitations of empirical subjects, that is, of

humans and all our activities and products. This naturalism without science would constitute not a doctrine but a constraint. But just as it disallows the suprahuman, it incorporates as the source of problems and analyses all that is human and human made – still a broad set of resources for philosophical reflection.

¹ Papineau, David, "Naturalism", *The Stanford Encyclopedia of Philosophy* (Summer 2021 Edition), Edward N. Zalta (ed.),
<<https://plato.stanford.edu/archives/sum2021/entries/naturalism/>>.

² Rysiew, Patrick, "Naturalism in Epistemology", *The Stanford Encyclopedia of Philosophy* (Fall 2020 Edition), Edward N. Zalta (ed.),
<<https://plato.stanford.edu/archives/fall2020/entries/epistemology-naturalized/>>.

³ "naturalism, n." *OED Online* (Oxford, UK : Oxford University Press, 2021
www.oed.com/view/Entry/12537.) accessed April 2, 2021.

⁴ *Random House Webster College Dictionary* (New York: Random House, 1991) p. 901.

⁵ "nature, n." *OED Online*, (Oxford, UK: Oxford University Press, June 2021,
www.oed.com/view/Entry/125353. Accessed April 2, 2021.

⁶ Simon Blackburn, *The Oxford Dictionary of Philosophy* (Oxford: Oxford University Press, 1994)
pp. 256-7.

⁷ Hilary Kornblith, "Naturalism: Both Metaphysical and Epistemological", *Midwest Studies in Philosophy*, XIX: 39–52. Reprinted in Kornblith, *A Naturalistic Epistemology: Selected Papers*, (Oxford: Oxford University Press. 2014. Pp. 104-118), p. 117.

⁸ See Rysiew, *op. cit.*

⁹ W.V.O. Quine, , "Epistemology Naturalized", in Quine, *Ontological Relativity and Other Essays*, (New York: Columbia University Press. 1969, pp. 69-90), p. 82.

¹⁰ Richard Grandy, "Epistemology Naturalized and 'Epistemology Naturalized'" *Midwest Studies in Philosophy* XIX (1994) pp. 341-349.

¹¹ Salk Institute. "Deciphering how the brain encodes color and shape: Study reveals how the brain processes the external world using overlapping visual circuits." ScienceDaily. ScienceDaily, 27 June 2019. <www.sciencedaily.com/releases/2019/06/190627164751.htm>.

¹² Gerald Edelman and Vernon Mountcastle, *The Mindful Brain* (Cambridge, MA: MIT Press, 1978)

¹³ Rodrigo Perin, Thomas K. Berger, and Henry Markram, "A Synaptic Organizing Principle for Cortical Neuronal Groups," *PNAS* (2011), 118, 13: accessed online: www.pnas.org/cgi/doi/10.1073/pnas.1016051108.

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- ¹⁴ Daniel Kahneman, “Maps of Bounded Rationality”
<<https://www.nobelprize.org/prizes/economic-sciences/2002/kahneman/lecture/>> accessed 2 July, 2021.
- ¹⁵ Gerd Gigerenzer and Wolfgang Gaissmaier, “Heuristic Decision Making” *Annual Review of Psychology* (2012) 62: 451-82. P. 456
- ¹⁶ Magdalena Malecka, “Knowledge, Behavior and Policy” *Synthese* 5 Feb. 2021, accessed online: <https://doi.org/10.1007/s11229-021-03026-6>
- ¹⁷ Helen E. Longino, *The Fate of Knowledge* (Princeton, NJ; Princeton University Press, 2001) p. 10
- ¹⁸ *Ibid.*
- ¹⁹ David Lewis, *Convention* (Oxford: Blackwell Publishers, 2002)
- ²⁰ Lewis, *op.cit.* p. 42.
- ²¹ See, for example, Brian Skyrms, *The Evolution of the Social Contract* (Cambridge: Cambridge University Press, 2014) and “Evolution of Signaling systems with Multiple Senders and Receivers” *Philosophical Transactions of the Royal Society B* (364, 1518 (2009: 771-779.
- ²² Longino, *Science as Social Knowledge* (Princeton, NJ: Princeton University Press, 1990) and Longino, *op.cit.*
- ²³ Cristina Bicchieri, “Covenants Without Swords” (*Rationality and Society* (2002) 14, 2:192-228) p. 193.