A traditional and central problem in the theory of knowledge has concerned skepticism about, for instance, the belief that there is an external world. For various reasons, including the intractability of this problem, a number of philosophers, notably Quine, have proposed a reorientation of the theory of knowledge, the "naturalization" of epistemology. Such a naturalized epistemology is conceived of as a basic element of a complete empirical cognitive science; it takes for granted that we do know there is an external world, and examines our actual knowledge-gathering procedures — for example, the input-output relation between a subject's sensory history and the total conceptual scheme he or she constructs. The question is, can a naturalized epistemology coherently avoid the traditional challenges of the adequacy of our knowledge-gathering practices? I shall sketch an argument that the program of naturalizing epistemology entails, in effect, a kind of antinomy: even as it sets aside traditional skepticism, it provides the basis for a new conclusion that there are philosophically significant limits for empirical knowledge. Our knowledge would be limited in this way in all but the most implausibly manageable of possible worlds.

Symptoms of this tension appear in earlier attempts to eliminate the philosophical question of how well reality fits the "ideal theory." For example, Peirce's classical attempt directly to define away the question is, "The opinion which is fated to be ultimately agreed to by all who investigate, is what we mean by the truth." Yet, only two pages earlier, Peirce also endorses a conception of mind-independent reality that his own definition of truth seems prima facie to exclude: "We may define the real as that whose characters are independent of what anybody may think them to be." How can Peirce have reality so mind-independent — "entirely independent of our opinions" — if truth is not, if "any man, if he have sufficient experience and he reason enough about it, will be led to the one True conclusion"? While the distinction here between subjective and objective concep-
tions of reality remains in need of much clarification, it is interesting to find signs of a parallel ambivalence between Putnam’s recent arguments for “internal” (as opposed to “metaphysical”) realism, and his Pickwickian implication that internal realism is not in fact entirely antirealist.  

Part of the philosophical import of the limitations I shall describe is that they suggest that verificationism fails in one of its principal functions in philosophy: to eliminate the distinction between appearance (our current or ideal theories) and mind-independent reality, by making skepticism cognitively meaningless. Nonetheless, despite its failings, some moderate verificationism is extremely difficult to avoid; we must acknowledge a pressure toward it. For the purposes of this paper, verificationism can be identified with the following version of the verifiability principle: If proposition $p$ is cognitively meaningful, then it is logically possible to confirm or disconfirm $p$. ‘Cognitively meaningful’ here means, capable of being true or false.

1. NEURATH’S BOAT

Let us start, at the beginning of the post-logical positivist era, with Quine’s argument,

we cannot detach ourselves from [our conceptual scheme] and compare it objectively with an unconceptualized reality. Hence it is meaningless, I suggest, to inquire into the absolute correctness of a conceptual scheme as a mirror of reality.

This “Neurath’s boat” argument recurs, of course, a decade later in World and Object, with the same premise, “There is no such cosmic exile,” and the same conclusion. And another two decades later in Quine’s latest book Theories and Things he argues in the same way to the same conclusion, that “What evaporates is the transcendental question of the reality of the external world — the question whether or in how far our science measures up to the Ding an sich.” Quine’s argument is very strong: we cannot ask about correctness of our current total theory, much less a Peirceanly ideal one. Is Quine committed to the extreme view that we cannot regard even our present theory as fallible and incomplete? Of course, Quine is just as well known for insisting to the contrary, for instance, in the lines preceding the first quotation of this section, “we can improve our conceptual scheme ... bit by bit while continuing to depend on it for support.” However, as with Peirce, there seems to be a tension between these two Quinian views: I shall argue below that the Quinian program of naturalizing epistemology and the account of charity
of translation do indeed indicate that Quine sometimes excludes the possibility of at least large scale errors or gaps in our current conceptual scheme.

Furthermore, I shall argue later that even the epistemic idealizations of verificationism clash with one of the most basic elements of our total theory, our picture of man’s place in nature. The scientific world view has relatively unexplored implications that conflict with the secular credo of a Peircean, American epistemological optimism — that “Nature cannot fool all of the investigators all of the time,” i.e., forever. (Competition of ideas in the free marketplace of inquiry must yield indefinite perfectibility of man’s knowledge, and so on.) The opposing view is a challenge of scientific methodology’s guarantee of total truth, and not just a claim that this truth can only be approximate: It is deeply implausible that man can have a complete and completely correct theory of the universe. Science may be the final arbiter of truth, and science itself may explain its own success (e.g., as Richard Boyd proposes that a realist causal theory of perception accounts for the convergence of mature theory); but it also suggests limits for this success.

Indeed, our world view seems schizoid, in that it includes both the above scientistic, Peircean optimism and conflicting platitudes of pessimism. The basic idea of the following sort of limits for knowledge is therefore not new. For example, versions of the first argument below seem to be at least as old as the theory of evolution. Elements of the argument appear in Bergson’s Creative Evolution; DuBois-Reymond’s assertion in the nineteenth century, “Ignoramus et ignorantibus” — “we are ignorant and shall remain ignorant” on some scientific matters — was rejected by Hilbert in his famous “Mathematical Problems” paper (subsequent incompleteness results of course have constrained Hilbertian optimism for mathematical knowledge).8

2. OCCAM’S RAZOR

My two arguments can be thought of as naturalized epistemology undercutting itself. The arguments gain force from a Great Chain of Being perspective that is also part of the scientific world view. The naturalistic standpoint reveals a hierarchy of organisms more primitive than ourselves: From our position of relative omniscience, we know on the phylogenetic scale that flies can never understand fly bottles, cats cannot figure out canary recordings, and so on. Even within our own species, the chain of levels of cognitive capacity continues in our theories of ontogenetic development of children,
comparative cultural anthropology, and the history of our own science. It is then natural to extrapolate from this "downward-looking" viewpoint to the idea that some puzzles may be intractable for us, too. We cannot emerge from our own Platonic cave.

The first argument for limits for knowledge is that the conceptual scheme we possess is the result of our use of methodological principles, in particular, Occam's Razor; but it seems to us somewhat more likely than not that what we judge to be the simplest — or most natural, plausible, elegant, or useful — theory will not always be the correct one. The point goes beyond just speculating about whether we have the slightest good reason to expect that the world really is objectively simple, e.g., whether Occam's Razor can be non-circularly justified. For example, Donald Campbell (even Quine) points out that natural selection builds into us particular perceptual and cognitive biases.9 But why should what is innate be true, as opposed to just efficient or conducive to species survival? For, whether or not the world is "objectively simple" in any sense, we have to accept simpler theories, ceteris paribus, for the "subjective" reason that otherwise our limited minds would eventually be overwhelmed by gratuitous complexity.

On the one hand, biology, psychology, anthropology, and so on suggest that evolution designed our cognitive tool kit for a specific terrestrial hunter-gatherer environment of middle-sized objects like bananas and lions. On the other, physics customarily trichotomizes its objects of investigation by size into three domains: The first is the above middling one of everyday human experience, accessible to our unaided senses, where Euclidean geometry and classical mechanics apply well. The second is the astrophysical/cosmological realm of the largest objects — planets, stars, galaxies, the entire universe. Here gravity is the dominant force, and non-Euclidean geometry and general relativity theory apply best. The third domain is that of microphysics, of very small particles studied over very short intervals; nuclear forces dominate, and quantum mechanics with its non-classical models of causation best applies. There are many other dimensions besides size on which we can similarly extrapolate in either direction — temperature, density of matter, age of the universe, duration of events. Without challenging the unity of science, we can see that on these dimensions, Uniformity or Homogeneity of Nature does not seem to hold too strictly.

From this "Scientific American" perspective,10 the universe appears to have a nested structure: we seem to be able to extrapolate indefinitely on
many of these scales. The plausibility of the cosmological hypothesis that the universe is virtually unlimited in diversity therefore seems at least an interestingly open empirical question. And the normal human terrestrial environment falls in the middle here in many ways. The history of our science and culture of course indicates that, as our theories and instrument technology develop, our investigations are taking us farther and farther from the original middle-sized domain, into, for example, the clearly very different astrophysical and microphysical realms. This occurs much too rapidly for natural selection to keep us cognitively pre-tuned in any respect. We therefore face a worse than Sisyphean prospect that, as we master familiar domains, we confront an indefinite series of stranger domains.

Must our intelligence necessarily be sufficient for all problems we could encounter? It seems a questionable article of faith that our minds, or brains, are unlimited in flexibility and adaptability. Natural selection appears to design — overdesign — for maximum efficiency in the given environment. (Two cases of perceptual, as opposed to cognitive, design closely approaching theoretical limits: human hearing is sensitive to motions of the eardrum as small as the diameter of a hydrogen atom; individual retinal receptors can respond to as little as half a dozen quanta of light.) It is not at all clear that there could be a cognitive system attuned to all aspects of the apparently unlimited diversity and complexity of the universe. But even if this were feasible, it would not seem good design to build a species' minds that way, since the evolutionary pressure is to make tradeoffs for maximum efficiency in only the terrestrial environment, and so to pre-tune specifically to it.

Thus, a naturalized epistemology begins by setting aside the classical justificatory questions of the adequacy of our knowledge-gathering practices, but ends up providing the basis for a new suspicion that there are deep limits for our knowledge in all but the most implausibly homogeneous and manageable of possible worlds. Indeed, it would be an odd accident if our subjective canons of scientific acceptability turned out to match in all respects the objective character of the universe. Why should our cognitive capacities be adequate for all domains, any more than our respiratory capacity can serve on mountain top or ocean floor? Ten billion homo sapiens, or however many hominids have ever lived, can be wrong. We wonder: From the fact that we have no need of an hypothesis, just what should we conclude about its falsity? Conversely, knowing that if God did not exist we would have to postulate Him, should not make many more theists.
3. THE FINITARY PREDICAMENT

The conclusion of this first argument is that we are unlikely to have entirely correct and complete theories; our innate cognitive biases may cause us to accept some falsehoods and reject some truths. The conclusion of the second argument is that we may be unable to have complete theories, because some interesting true theories (as opposed to mere exhaustive enumerations, etc.) are likely to be too complex for us to understand, or even read through. Briefly, the starting point of this argument is one of the most fundamental aspects of the human condition, that we are in the *finitary predicament* of having fixed finite limits on our cognitive resources, a point I have discussed elsewhere. If this thesis is part of the complete cognitive science that includes naturalized epistemology, it must be the most basic law of psychology, besides some principle of (moderate) maximization of utility. In contrast, our world view seems to present us with a universe of indefinitely great diversity and complexity, as sketched above. It does not now seem especially plausible even that the theory of the universe is finitely axiomatizable at all, much less axiomatizable in a form comprehensible to *homo sapiens*, with no five-mile long sentences.

Furthermore, even if all the basic laws of the universe are finitely representable, this ultimate web of belief may be unmanageable by any physically feasible agent because of fundamental information-processing limitations. It is now a familiar point that cognitive systems must exceed some minimum size, because of the holistic interdependence of beliefs, desires, and so on. In addition, I think that recent work in the field of computational complexity theory raises the possibility that there may be a "critical mass" for a knowledge representation, a maximum size threshold above which belief systems must in effect disintegrate: For a representation to qualify as being understood by an epistemic agent, the agent must be able to perceive an adequate proportion (not necessarily all) of the interrelations among elements of the set. Otherwise, the agent will not be able to identify and eliminate enough of the inconsistencies that arise, recognize enough interesting consequences, and so on. But as the "mind's dictionary/encyclopedia" grows, it becomes much more difficult just to search, even with cataloguing and cross-referencing of its propositions or theories. In particular, the number of possible combinations among the elements explodes exponentially. Complexity theory has shown during the last decade that much of this computational cost is
unavoidable: many types of quite simple logical processing (e.g., just deciding validity of monadic predicate calculus sentences) are intractable — no algorithm can always evade severe combinatorial explosion.\textsuperscript{13}

The range of intractability results leads one to wonder in turn whether knowledge systems of some finite size may be so computationally unwieldy in this way as to shatter — perhaps to be unmanageable even by means of quick and dirty heuristics. This speculation is supported by familiar complaints about the growth, inevitability, and cost of the division of cognitive labor in the scientific community. A few hundred years ago a single person could possess all interesting scientific knowledge; today specialization is ever finer. We worry about limits to scientific, as well as economic, growth.\textsuperscript{14} Thus, there seem to be possible worlds that would be too complicated for us or a society of experts to represent feasibly, to "get it together" enough to understand. The crippling compartmentalization we in fact observe may be a symptom that ours is such a world. The breadth and depth of putatively possible knowledge may be intrinsically too great for a both manageable and complete world view, whether it is the ideal theory or just our Peircean approximations to it. For, the universe may be not merely inhumanly complex, but "transcendentally" unmanageable for any physically realizable entity, for example, an ideal computer occupying the twenty billion light-year radius and twenty billion year age of the universe; the above intractability results apply with just this generality. Augmenting the human mind by means of computers should therefore not be much help.

"To be is to be comprehensible by us" thus seems implausibly and unhelpfully anthropocentric. It is wishful thinking to assume that in this sense man must be the measure of all things. That is, rejecting the above limits for knowledge requires a particular type of cosmology, one which ensures a pre-established harmony of man with universe. It would be a peculiar coincidence in need of much explanation if, for every domain, every one of the interesting true theories, and all of them together, should just happen to be simple enough to be usable by, and intelligible to, us.

4. TRANSLATION

The above Occam's Razor and finitary predicament arguments begin from natural questions, and there are other arguments with similar conclusions. A tension therefore emerges: Our world view contains a kind of antinomy. It
implies that it itself, and presently plausible extensions of it, are unlikely to be in all respects correct and complete. We can then agree with Quine and Neurath that this world view tells us, “I’m the only scheme you’ve got”: we cannot, and ought not to, abandon the current conceptual scheme. But its indispensability does not make it true. By what standard can it be judged? — Itself: Even if we grant that philosophy “is not to be distinguished in essential points of purpose and method from good and bad science,” Quine does not thereby evade the question of the correctness (nor, of course, of the completeness) of the total scheme, because our scheme itself suggests that the “known” (and knowable) world is not the entire actual world. And yet we do not end in Descartes’ self-paralyzing universal doubt. Quine’s Neurath’s boat conclusion thus seems too strong\(^1\) — in this sense, the actual need not be the ideal.

A corresponding difficulty in envisaging alternatives to, much less improvement of, the present conceptual scheme pervades Quine’s account of translation. Over the same decades that Quine has espoused the Neurath’s boat argument, he has claimed that to say a language is radically different from our own is

... to say no more than that the translations do not come smoothly ... The whole truth about the most outlandish linguistic behavior is just as accessible to us, in our current Western conceptual scheme, as are other chapters of zoology. The obstacle is only that any one intercultural correlation of words and phrases, and hence of theories, will be just one among various empirically admissible correlations ...\(^2\)

(Quine seems to agree in spirit with a remark Neurath endorsed in “Protocol Sentences” on almost the same page as the boat analogy: “One ought to be able to make the outlines of any rigorously scientific thesis comprehensible in his own terms to a hackney-coach-driver.”\(^3\) Thus, although Quine is of course aware of genuine conceptual revision, for instance, that engendered in set theory by Russell’s Paradox, he ambivalently also holds that conceptual differences are never more than a matter of reinterpretation of utterances, of indeterminacy of translation. These claustrophobic prospects for conceptual change — no news as the only possible news — are not brightened by Quine’s descriptions of the proprietors of the schemes the translator tries to interpret. The translator confronts either equals or, inevitably, “savages,” “natives,” “heathen,” “naturkinder” with “jungle languages”; alternatives to our scheme are always more primitive, never more advanced. The suggestion conveyed once again is that our actual scheme must be the best.
Davidson has pressed the Quine line further, to conclude explicitly, "we have found no intelligible basis on which it can be said that schemes are different." Davidson argues that, on the one hand, "failure of intertranslatability [between schemes] is a necessary condition for difference of conceptual schemes," (p. 12) but on the other, by the principle of charity we cannot even count others wrong on most matters (p. 19). Thus, a dilemma: if a putative conceptual alternative is presently intelligible to us, it is just a paraphrase of our own scheme and not a genuine alternative; but if it is not intelligible to us, it has not been shown to be more than gibberish. We cannot make sense of the very notion of an alternative scheme to ours, much less a better one.

The thesis of the present paper implies that this is an amazing conclusion; among other things, a "Great Chain of Being" recognition of our limited capacities and of the subjective basis of our simplicity metric makes it seem extremely unlikely that ours is the only — or ultimate — scheme.

It should be noted that a six year old child who had not yet mastered the concept of "prime number" could, indeed would have to, argue in this Procrustean way that grownups' talk about primes must just be noise. The argument must therefore be fallacious; it pronounces much of everyday pedagogy an impossibility. One weakness seems to be the stringency of Davidson's (and Quine's) charity principles, e.g., "The basic methodological precept is ... that a good theory of interpretation maximizes agreement" of the subject with his interpreter. Davidson has even felt he had to deny that we can make sense of cases of an agent's failure to preserve perfect preference transitivity. But, should we be required to reinterpret Frege's Grundgesetze, and Quine's own Mathematical Logic, so that their axioms for set theory come out consistent?

If we demand only moderate or minimal, as opposed to perfect or near-perfect, charity then we have the room to allow that some of a genuine scheme may not only massively disagree with ours, but be unintelligible to us. And this is no longer a mystery; we can explain it by supposing that the scheme is different from, and perhaps more sophisticated than, our own. Contrary to Davidson, the dogma of a dualism of appearance and reality consequently remains, in that we can make sense of a split between our current scheme and at least what is described by better schemes.
5. VERIFICATIONISM

An important way to reinforce the Quine-Neurath argument is by means of verificationism: challenges of the correctness of my current scheme are meaningless, because no evidence could ever bear on the issue. But now it seems that the verifiability principle similarly cannot exclude philosophically interesting limits for knowledge. Traditional skepticism says that I cannot in principle have the slightest good reason for believing (or rejecting) that, e.g., there is a mind-independent reality. Since the proposition ‘There is a mind-independent reality’ is therefore not verifiable or falsifiable, it is cognitively meaningless according to the verifiability principle. But the conclusion of the above arguments against Quine might be called “positive skepticism”: We do have a little evidence that our conceptual scheme is not correct or complete.

More importantly, the crucial feature is that we can envisage having more evidence that this is so; it is logically possible to get more confirmation of this hypothesis. We can imagine less tractable domains we might (indeed, seem likely to) encounter as we extend our investigations further and further from the ordinary terrestrial environment. For such a domain, we might find that we could construct no interesting successful theory. We know of no reason why this impasse might not persist even to an ideal limit of inquiry. The longer this *cul de sac* scenario continued, the more justifiable would be our loss of faith in the hypotheses either that all is knowable or that there is anything to know here — i.e., that in all respects the universe is orderly. We would have to choose between the explanations that some objective regularities are inaccessible to us, and that this domain is just intrinsically irregular. Other things being equal, the latter account entails more unsatisfactory — i.e., unexplained — assumptions of goodness of fit between our intellects and the universe, as discussed earlier.

In at least one respect, the impossibility of knowledge suggested by the above Occam’s Razor argument may be sufficiently close to traditional skepticism to be unproblematic. Even ideal inquirers with all the data there ever could be would seem to need a simplicity/plausibility metric; hence they could still wonder whether they would be even in principle able to eliminate that source of bias. But a natural reply to the finitary predicament argument is that the alleged unknowability is merely practical and so should be ignored: it may be presently technically or even physically impossible to verify some correct huge theory, but verification is still logically possible. This second
limit for knowledge is thus not an "in-principle" one, so we do not yet have counterexamples here to the verifiability principle — true but interestingly unknowable propositions. Schlick noted with some care half a century ago that 'verifiability' must be interpreted in this strong way.\textsuperscript{21} And of course at the beginning of the century Peirce had insisted on identifying true propositions with the result of pursuit of inquiry to an ideal limit.

Assuming coherence of the concept of such a hypothetical limit, the problem for this, like many other idealizations, is that as we progressively idealize the inquirer, his verification procedures, and his resulting total theory, his God-like omniscience becomes less and less applicable to real cases. The fact that our present cognitive limitations might not be retained in the ideal case, or successive approximations to it, is radically irrelevant to the predicament of the finite human investigator. For example, evolutionary theory does not make it seem implausible that creatures more intelligent than ourselves may someday slouch over the horizon. But if the Martians or whatever brought us today a perfect oracle or a Doomsday Book containing (one of perhaps many alternative versions of) the final theory, it is likely we could not understand or use much of it. Indeed, how could we even recognize it as an ideal theory? The antirealist's ideal theory seems to serve the epistemological function of the realist's thing-in-itself; if this maneuver yields an improvement in epistemic accessibility, it is only by an epsilon. The idealizers' victory thus is Pyrrhic: the idealizations amount to granting a skeptical conclusion for anything like our situation. It is impossible for us to know the whole truth.

Indeed, the argument for these limits for knowledge applies not only to human beings, but to any creature of finite resources, even if those constitute the entire known universe. A more extreme idealization of the investigator is agent-as-Turing-machine, with no fixed limit on memory or computing time. It is very important to remember, though, that even such an inquirer, using purely formal procedures, still faces simple but absolutely unsolvable deductive questions, such as the Halting Problem. In this sense, the unattainability of a Peircean ideal limit seems at least as severe, and philosophically significant, as the unsolvability of the Halting Problem. (An even more idealized investigator might not be restricted, as Turing machines are, to executing algorithms of finite size.) While philosophy may not be especially interested in limitations imposed by, e.g., everyday carelessness, it is also not solely concerned with highly idealized investigators. We must deal with the inter-
mediate case of the basic epistemological predicament of actual organisms with limited cognitive resources, such as ourselves — this seems the least controversial part of naturalism.

6. MINIMAL RATIONALITY

In fact, the argument of this paper against perfect epistemic agents in the field of empirical knowledge can be conceived of as part of a general program of constructing a philosophical theory of the agent that is less idealized than standard decision-theoretic inspired ones. The typical idealization requires the agent to have a perfect capacity to choose actions appropriate for his belief-desire set; that in turn requires the agent to be able to make virtually any deductive inferences from his beliefs. For such an agent, much of the deductive sciences would be trivial. This therefore seems a profoundly inapplicable idealization, not just a harmless approximation of actual human rationality.

And the program of developing less idealized theories of the “minimally rational” epistemic agent for empirical as well as deductive sciences meshes with two extraphilosophical areas of intense current research: psychological studies of prima facie “irrational” human reasoning,22 and complexity theory in computer science. The “psychology of irrationality” reveals remarkably persistent and ubiquitous use of formally incorrect heuristics in everyday reasoning. As discussed earlier, complexity theory indicates very stringent practical limitations on even an “ideal computer” with literally the resources of the entire universe; in some respects it is as if, as a practical matter, Church’s Undecidability Theorem applied to formally correct decision procedures all the way down to tautology testing. The “quick and dirty” heuristics may therefore be indispensable to do better than guessing while avoiding computational paralysis. Of course, such imperfect procedures cannot suffice for an ideal agent. Positive skepticism fits in with the above two areas; it thereby possesses additional systematicity and explanatory power. For, the opposing tendency, to idealize away the “psychological reality” of our cognitive limitations, makes it easy to overlook the important implausibility of the hypothesis that in principle we can know everything.

Indeed, the above picture, suggesting such unexpectedly restricted knowledge of the computational universe, by itself seems to heighten awareness of an appearance/reality distinction. It reinforces the realist view that there are objective computational facts — e.g., primality of some large integer, or truth-
functional consistency of a set of propositions — existing independently of our knowledge-gathering activities. Furthermore, the picture of extensive practical uncomputability motivates unfolding the traditional philosophical dichotomy between in-principle logical and "mere" practical impossibility into a trichotomy: Practical impossibility may sometimes involve only current technological unfeasibility, but sometimes it involves principled limitations as hard to evade as computational intractability. If a task must require resources greater than those of the entire universe, that can be philosophically significant, not just an engineering obstacle, even though the task remains "in principle" possible — e.g., for a more ideal investigator that, like a Turing machine, has potentially infinite memory space and computing time.

7. A KANTIAN ARGUMENT

The above arguments for limits for knowledge are empirically based, in that they conclude that the hypothesis, 'our theories can be complete and completely correct,' at least can be empirically disconfirmed. This approach is worth contrasting briefly with stronger, a priori arguments that we cannot even make sense of this hypothesis. One part of the discussion of the antinomies of the "ideas of reason" in the Dialectic of Kant's *Critique of Pure Reason*\(^\text{23}\) contains the most important basis for an argument that we cannot accept the hypothesis that we could know everything. For example, in the conclusion in his later *Prolegomena to Any Future Metaphysics*, Kant asserts,

> We cannot ..., beyond all possible experience, form a definite concept of what things in themselves may be. Yet we are not at liberty to abstain entirely from inquiring into them; for experience never satisfies reason fully but, in answering questions, refers us further and further back and leaves us dissatisfied with regard to their complete solution.\(^\text{24}\)

Skirting intricacies of the larger Kantian program, we can note that on the one hand, Kant's first sentence above expresses the empiricist strain of his account: Further, "if even the pure concepts of the understanding are thought to go beyond objects of experience to things in themselves (noumena), they have no meaning whatever." (p. 60) This theme is familiar from our earlier critique of verificationism. On the other hand, the second sentence asserts that if unexperienceable things in themselves are nonsense, they are for us *indispensable* nonsense. Again, "It would be, on the other hand, a still
greater absurdity if we conceded no things in themselves ...” (p. 99); such ideas have a necessary regulative role in the conduct of science.

In particular, Kant’s argument here seems to imply, among other things, that we cannot make sense of the notion of the completion of scientific inquiry, the end-state in terms of which Peirce defined truth. For instance, we cannot conceive of any end to “why” questions. One such argument might proceed by a kind of inductive schema: (a) Initial case: We require explanations of everyday, observable phenomena. (b) Inductive step: Given any current basic level of general explanation, we can always ask the “child’s question” of why in turn that explanatory story holds. We cannot seem to imagine an answer that would terminate this series of questions at any stage of inquiry. For example, one might attempt to stop the “atom-proton-quark ...” regress by just postulating an infinite hierarchy of sub-quark-like objects; but then one can ask about the causes of this hierarchy itself and its properties. (In the discussion of the cosmological antinomies Kant of course also argued that we cannot imagine the world without a first cause; however, Kant’s final view seems to be that quoted above from the conclusion of the Prolegomena.) At least this much of the Kantian account seems to entail that we cannot even find it intelligible that we might not be in this type of Sisyphean predicament.

Thus, part of human nature is to raise empirically intractable questions.25 And, at least from our perspective, this uncompletability of inquiry seems to hold for any finite epistemic agent, not just human beings. If Descartes’ Evil Demon has finite cognitive resources, he confronts the same predicament, of endless questions that must eventually outrun those limited resources. For the deductive sciences, of course, we know that a creature with a finitely represented formal deductive capacity — even with potentially infinite memory and computing time — is limited by the classical undecidability results. (A more idealized intelligence might possess the omniscience studied in rational theology. One question is whether the concept of such supernaturally unlimited capacities is coherent. Also, a finite intelligence that encountered such an apparently perfect being would face a special other Minds problem: could the finite agent have any good reason to conclude that the other being was in fact omniscient, rather than just very smart? Further examination of the various notions of the ideal limit of inquiry is needed.)

The most important question this glance at Kant is raised is, could we ever eliminate positive skepticism and know, or even have some justification
for thinking, that we had eliminated it? In the most manageable and apparently comprehensible universe, our criteria for acceptability of empirical theories will still be seen to be at least partially subjectively based and hence to that extent suspect, and the obviously limited nature of our intellectual capacities will cast a doubt on the assumption that we can know everything. Indeed, it might be that the universe is in fact comprehensible for creatures of finite intelligence such as ourselves, but even if it were, we would still have some good reason to overshoot, to reject such a cosmology. The belief in our limits may therefore itself be a part of our unavoidable acceptability biases. In this way, a belief in limits for our knowledge seems more than just an accident of the current Zeitgeist.

Beginning with basic features of our theory of ourselves as epistemic agents, our picture of our universe, and the relation of one to the other, I have argued against the widespread positivist viewpoint expressed in this passage from *Language, Truth, and Logic*:

One way of attacking a metaphysician who claimed to have knowledge of a reality which transcended the phenomenal world would be to inquire from what premises his propositions were deduced. Must he not begin, as other men do, with the evidence of his senses? And if so, what valid process of reasoning can possibly lead him to the conception of a transcendent reality?^26^  

I have suggested that as we try to deny an appearance/reality distinction by means of such verificationist strategies, whether explicit or implicit, the distinction reimposes itself and questions rather like the traditional philosophical ("skeptigenic") ones arise again.  

Reducing philosophy to science does not evade them. Thus, epistemology *redivinus*: In this respect, Richard Rorty's recent announcements^27^ of the death of epistemology seem premature, since science itself, in motivating doubts about the future of progress, still distinguishes between mere correctness of game-playing within its own disciplinary matrix, and truth. Similarly, contrary to Putnam's recent arguments for "internal realism" along the lines of Quine's earlier "no cosmic exile" point, an external "metaphysical" realism seems not to require the impossibility of a God's-eye extratheoretical skyhook; rather, it is a consequence of our world view itself.  

Unlike traditional skepticism about, e.g., existence of physical objects, the skepticism here is positively supported, but it is nonspecific — we cannot now say exactly what it is we do not and cannot know. In this way, 'However
reality is, it is unlikely to be as we believe it to be’ is the ultimate Preface Paradox. Therefore, as with traditional skepticism, we should not worry in practical or scientific matters about this type of skepticism — in particular, withdraw acceptance of all our current theories. *Ex hypothesi*, these theories are the best we presently have. Similarly, despite this shortcoming of the verifiability principle, the recommendation is of course not that science give up and become fanciful nonempirical speculation, any more than that a basic desideratum like simplicity be abandoned. The bearing of this skepticism is rather within traditional theory of knowledge. It tells us something about ourselves, part of our relation to the world. It indicates types of limits for knowledge that recent philosophy has tended to overlook, apparently because of prevalent overidealization of the epistemic agent.

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NOTES


P. 200, Ayer, ed., op. cit. See also the similar remark cited by Hilbert, op. cit.


In The Language of Thought (Crowell (New York, 1975)) Jerry Fodor arrives by very different means at a “no news” conclusion rather like Davidson’s: “There can be no such thing as learning a new concept.” (p. 95) Fodor’s argument is based on the innateness hypothesis that all human beings employ the same species-specific internal “language of thought,” into which any public natural language expression must be translatable in order to be understood. (Martians would thus correspondingly be locked into their own innate conceptual inventory.) Like Davidson, Fodor assumes that understanding can occur only by means of direct translation. Some of the paradoxicality of Fodor’s conclusion dissipates if one distinguishes between acquiring new elementary concepts and new complex ones; at most, the argument seems to apply to the former. (Given this semantic ultranativism, it is not surprising that more recently Fodor has broached, if not ventured to answer, the question of whether the mind is “epistemically bounded,” i.e., constrained in its knowledge by its cognitive organization; see pp. 119–126, The Modularity of Mind, MIT Press (Cambridge, 1983).)


Bk. II, Ch. 2. N. Kemp Smith, tr., Macmillan (London, 1929).


Cf. Hume’s earlier remark, “...‘tis almost impossible for the mind of man to rest, like those of beasts, in that narrow circle of objects, which are the subject of daily conversation and action.” p. 271, Treatise, of Human Nature, H. Selby-Bigge, ed., Oxford Univ. Press (Oxford, 1965). The very first sentence of the Critique of Pure Reason
(p. 7, op. cit.) already goes beyond Hume here.


28 On how to interpret the Preface Paradox so that it is a truth, see my 'Rationality and the structure of human memory,' *Synthese* 57 (1983), pp. 163–186.

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