

# Deference, Humility, and Awe

## The Epistemological State of Cognitive Science

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### I • Part I – Religion

- A. Absolutely not a scholar of religion; nevertheless a few introductory remarks
- B. What religion is not
  - 1. In many pieces I read, about relations between science and religion, the religious side (Abrahamic and otherwise) is characterized in terms of a number of distinctive sorts of thing:
    - a. First, particular *patterns of myths & stories*: about fathers & sons, gods & goddesses, spirit worlds, origins of the world, transubstantiation, etc.
      - i. In many cases, particular personages figure large in these myths: Jesus in my own case; for others, perhaps Vishnu or Buddha or Mohammed or something or someone (or someones) else.
    - b. Second, especially in the Abrahamic faiths, religions are characterized in terms of *factive beliefs*: whether you assent—not only believe, put commit yourself, pledge allegiance to—various *sentential propositions*:
      - i. That God exists
      - ii. That there is an afterlife (perhaps mapped in terms of Heaven, Hell, purgatory en route, whatever)
    - c. Third, of course, paradigmatically, *Good and Evil*—often manifested in various forms, appearing in different roles, played by different actors, and so on. But they are usually there.
  - 2. Especially in discussions of religion’s relation to science, it is the factive beliefs that are usually given primary focus—possibly since science, too, traffics in factive beliefs (that bodies consist of cells, that energy is conserved, that the world is causally closed), and because, on the face of it, scientific factive beliefs and religious factive beliefs often seem at odds.
  - 3. Now my reaction to these characterizations of the religious, to be honest, is usually *complete frustration*.
    - a. Those myths and stories and personages *aren’t the point*, I always feel.
    - b. They are *vehicles* for religious understanding; not religious understanding itself.
    - c. And the conflicts of in statement of fact aren’t particularly interesting.
      - i. For starters, they’re hardly surprising.
      - ii. Most of the religious myths with which we are familiar were framed hundreds and even thousands of years ago, in natural philosophies hewn well before the rise of natural science.
      - iii. Our understanding of the world has developed immensely since then.
      - iv. It is no surprise, therefore, that walking on water, or having four or eight or a hundred arms, or being visited by spirits or angels, are viewed with suspicion.
    - d. But those stories, in my view, are ancillary—besides the point, or anyway besides the *ultimate point*.
    - e. They are certainly beside the point with respect to anything I am going to say today.
- C. So what *do* I take the religious to be?
  - 1. That is harder to say exactly, but I think I can convey a sense.

2. A terminological comment, first
    - a. I am going to avoid the count-noun ‘religion’—which I think of as a rather colonialist category used by imperialist civilizations to name—and to some extent to “other”—a variety of civilization-constituting metaphysical orientations alien to their own natural philosophies.
    - b. Instead, to the extent that I use the r-word at all, I will talk about *religious traditions*—and to some extent (though not much even in this case) about *what it is to be religious*.
  3. Ultimacy
    - a. The way I understand religious traditions, then, is as socio-cultural efforts to frame and answer and pass on to future generations *ultimate questions*—historically-worn strategies people have developed
      - i. To formulate their deepest wonders and wondering;
      - ii. To give voice to their most profound understanding of what matters;
      - iii. To “reach beyond” their daily concerns to consider issues of sweeping gravity;
      - iv. To found their sense of normativity and ethics;
      - v. To develop a moral compass with which to chart a navigable course through the inexorable trials and tribulations of life;
      - vi. To forge a sustaining and intelligible account of significant life.
- D. This raises an obvious question: is it possible to frame—hypoallergenicly, in ways to which a contemporary scientifically-trained sensibility would not rebel—any of the issues that have been raised in the religious traditions, any of the insights that have been reached? Well, I think it is—at least approximately.
1. Christianity
    - a. Here’s one, for example, which I associate with Christianity, or at least the version of Christianity in which I grew up: that *love trumps justice*.
    - b. Just 3 words; though of course vastly more needs to be said, as is said, to make good on it, to plumb its depths.
    - c. But when (i) enriched with appropriate understandings of compassion, forgiveness, justice, etc., and (ii) understood in a way which doesn’t, in the process, underestimate the gravity and importance of justice, those 3 words pretty much sum up what I, at least, took from Christianity.
    - d. There’s tons more, of course, in the Judaic tradition on which Christianity rests. But Christianity itself? Well, I confess that those 3 words pretty much constitute my elevator speech.
  2. A second one: what about God?
    - a. God? Who knows? It’s not a word I use at all.
    - b. If pressed, I would probably lean in the direction of Teilhard de Chardin direction, towards something like the word ‘God’ being the name of the *ground of being*.
      - i. Incidentally, I’ve never read Teilhard de Chardin.
      - ii. (I tell you, I really do know nothing about this whole topic.)
    - c. The point, though, is that I the conception of God of those people who write most vociferously against religion to, again, be besides the point. Moreover, not only do I not their conceptions seriously; my sense is that many deeply religious people do not, either.
      - i. I like a comment made by Fergus Kerr, a religious scholar and devout Catholic priest in Edinburgh. “Tell me about this God you don’t believe in,” he often says. “I suspect I do not believe in him either.”
    - d. Rather, my usual strategy is to recognize God-talk as manifesting a profoundly humble orientation to the *transcendent*.
      - i. For surely this is a common theme throughout religious traditions, whether theist or not

(and in the theistic traditions perhaps especially in their mystical variants) not only of orientation or deference towards, but also originary dependence on, the ultimate—that which is profoundly, inexorably, and unutterably beyond our grasp, our comprehension, our words.

- α. “I know that Allah is greater than I know him to be,” says the muezzin.
  - β. That “which surpasses all understanding” (Philippians 4:7)
  - γ. Cf. also the burning bush
  - δ. That one cannot look God in the face (or even name him)
  - e. “Browning to the max”, one might say: that the world that sustains or constitutes us, in a sense of “world” much bigger than what people normally mean by world—perhaps better said as “the totality”—transcends our grasp in more profound ways than we can imagine.
3. And so on.
- E. So what does this orientation lead us to say about religious *belief*?
- 1. I can’t answer that one without acknowledging my father, whose influence on me on these topics is so permeating that it is unlikely I have contributed anything of my own.
  - 2. I will just tell an anecdote
  - 3. When I was about 16, I came home and said that I couldn’t pretend to be religious anymore, because I didn’t believe all the things they told me I had to.
    - a. “If they require you to say that you believe things *in the sense of assenting to the truth of this or that proposition*,” he said, “then you have to leave. “Belief” had originally to do with love; “credo” meant *give your heart*. The idea that to be religious is to *assent to propositions* is an historically new idea, only a couple of hundred years old, which is *fatal to what matters most about the religious traditions*.
    - b. “There’s just one problem,” he went on. The problem with rejecting the religious traditions is that you will lose vocabulary to talk with your closest friends about what matters to you most.”
    - c. “What is it to be religious?”, I asked.
    - d. “To find the world significant,” he replied.
- F. So...
- 1. Forget the stories; and forget the factive propositions (even my proposition that loves trumps justice)
  - 2. Discard, too, the pernicious, the xenophobic, the blinkered. By no means do I think everything distilled into historical religious myth is worthy of retention. And discard, too, I would add, the *tribal*. (If I could rid the world of any one thing, it would be tribalism and sectarian allegiance.)
  - 3. Instead, recognizing that these traditions embody humanities’ best understanding, hewn though many centuries, of the deepest insights into ultimate questions, and ask the following question
    - a. How, in the 21st century...
      - i. In words that mesh, without compromise, with the very best in science...
      - ii. In words that do not violate our contemporary understanding of the world...
      - iii. In words that are progressive, inclusive, culturally sensitive, etc.,...
    - b. How, in such words, we can express—or at least make room for, wrestle with, coalesce our understandings of—issues of maximal gravity, the things that matter most?
  - 4. How, that is, in contemporary, progressive, and helpful terms—with passion, dispassion, and compassion—we can deal with ultimate issues?
  - 5. And how, too—to start to bring this towards cognitive science—can we recognize that *reaching for such understanding, striving to express such understanding*, has been as fundamental a fact as any about the nature of the human mind?

## Part II – Part II – Science

- A. I want to tell a “just-so” story about the foundations of science—running roughshod over Bacon and Locke and myriad other folks—but, I believe, getting at something fundamental about the scientific method.
1. Science, I guess, must be a bit more complex than Christianity, because my elevator speech about it has 4 words: *defer to the world*.
    - a. The fundamental project of science, I take it, since the beginning, has been to examine the world, and to derive an understanding of it *from* it—an understanding of nature, of whatever you like the call things that are out there—not from divine revelation, nor from pure logical reflection, nor from the authority of sages, but from *that which is beyond us* (beyond our minds, anyway), towards which our words and thoughts and experiments are directed.
    - b. That is: *try to figure the world out*. And try to test or verify or reproduce or validate or otherwise ensure the worth of your claims about it, as best you can.
    - c. So explain it; come up with theories.
    - d. But here’s the bottom line: if words and world disagree, *the world wins*. Adjust your words!
      - i. Science is not engineering or programming, in other words, whose mottos might be: when words and world part company, *debug the world*.
      - ii. Science is not quite art, either—though it may be artistic. But it is not just the externalisation of inner creative imagination.
      - iii. Rather, at its most fundamental level, I take science to be an attempt to come to grips with the world beyond—beyond our selves (our favourite misconceptions), and also *beyond what we yet understand*.
  2. Moreover, since the beginning, there has also been a permeating sense of the magnitude, the majesty, the mystery behind scientific discovery.
    - a. A wonder that was inspired by the microscope—and the telescope.
    - b. A humility engendered by Copernicus, and our de-centering in the universe
    - c. A sense of the vastness, and continuing inscrutability, as well as scrutability, of what lies beyond that small fraction of the world of which our unaided senses had made us aware.
    - d. This sense of majesty was restricted just to *empirical* discovery, either.
      - i. Think about Gödel’s incompleteness proof, or Turing’s proof of the limits on computability; the humility of recognizing the extent to which most of the world lies beyond what we can understand, or come to know, or formalize, or articulate in language.
      - ii. It is a little making your way up the Canol Road, in the Yukon, to the ridge of the Mackenzie mountains, and looking out, beyond the summits (beyond where cars can go) over the vast stretches of the Mackenzie valley and the plains beyond. You have the sense that if you started walking the first person you might encounter would be in Moscow.
    - e. It is important, in a cynical age, not to underestimate that sense of wonder and mystery, and of our own epistemic humility in its face.
  3. Now I know that my characterizing science in these terms that will cause some of you to start screaming—to claim that this image of science is a culpable romantic fantasy—an imperialist conceit, onto which science studies and feminist epistemology and post-colonial studies and critical theory and poststructuralist thought have heaped dollop after dollop of excoriating critique. All that *happens* in science, the critics assert, are contingent practices of knowledge production controlled by contestable regimes of power. Circulating documents; professional maneuvering; funding regimes. Yes, I know all this; we’ll get there. But a little more, first, on the founding vision—

because I think there is something in the founding vision that is almost sacredly important—and is also something to which the critiques are constitutively blind.

B. The 20th century

1. Now it may be true that a rather arrogant sense emerged in science, towards the end of the 19th century, that we could actually get a grasp on reality; that “God wrote the world in mathematics”, that a kind of total (if not totalizing) comprehension was within sight.
2. But the 20th century dashed any such vain hopes.
3. Far from being grasped, the world turned out to be barely comprehensible—far more profoundly than anyone (except, possibly, religious mystics) could possibly have thought before then.
  - a. There is nothing “out there” vaguely like the NOA: straightforward objects, properties, relations, etc.
  - b. Moreover, any attempt to *reduce* what we normally take “the world” to consist in to what is actually out there looks pretty dismal.
    - i. Quantum mechanics—defies our commonsense not only of ontology but of logic, and makes the whole thing seem to exist on a house of cards.
    - ii. Relativity—things are not just weird in the small, but weird in the large.
    - iii. Wittgenstein—who argued that even if it wasn’t weird down at the bottom, and weird up top, we shouldn’t be too sure about the meso-scale world either.
    - iv. Then: the incompleteness of mathematics: we can’t capture *even as simple a thing as arithmetic* in a formal system.
    - v. Non-computability: we can’t figure out perfectly metaphysically secure properties of programs that *we ourselves write*.
    - vi. Chaos theory and non-linear dynamics: the smallest facts can have major consequences, meaning that without perfect measurements, which one mortal can have, one cannot be sure of what is going to happen.
    - vii. ... And so on.
  - c. Among other things, all of these drive an irrevocable wedge between determinism and predictability
  - d. They also buttress both our epistemic humility and our sense of the world’s extent—that that which we barely see, and still do not understand, continues to expand faster than our grasp of it.
 

— Cf. Pekka Sinervo on the Higgs Boson.
4. Summary of Part II:
  - a. The world is surpassingly strange.
  - b. We, surpassingly small.

### Part III – Epistemology

A. Let’s start to move towards cognitive science

1. Now cognitive science, in a sense, is *science gone reflexive*
  - a. If science is a process of reaching out, and try to understand, what is out there; then
  - b. Cognitive science, it seems should be a study of *how it is that people, or minds, are able to reach out, and try to understand ...*
2. So the first topic we need to address—applicable both to science itself (what we do) and to cognition (the subject matter we study)—is *how people do this*—how people can understand.

B. Epistemology

1. How, that is, can we pay attention to the world—reach out, beyond our skins, to the stars, to the

- origins of the universe, to the insides of a quark, to absolute zero, to parts of the universe outside our light cone with which physics prevents any causal interaction whatsoever?
2. How is science *possible*? And for that matter, how can I even reach out to *you*, rather than to the two-dimensional laminar surface that is currently reflecting light off of you. In fact how does my attention get past what is happening to me—the fact that a pattern of incident electromagnetic radiation impinging on my retina? How can I think about my partner, who is returning from Texas today and whose current location I don't know (even including what she is in)?
  3. The answer to how this is all possible has to do with *words, meanings, thoughts* and *theories*—with *reference* and *semantics* and *interpretation*—with what philosophers call *intentionality*, though because it is more familiar, I will summarize it here as our “epistemic capacities”.
  4. This is the topic on which I go on endlessly in my cognitive science courses: about how even the simplest references (my thoughts about you, for example, or my use of the word ‘tomorrow’) reach out across the universe, to “land on” (select, refer to) almost arbitrary patches and points of the world, without having to do so by sending any causal signal that direction.
    - a. Long-distance reference is absolutely astounding, in a mesoscopic world governed by  $1/r^2$  local physics.
    - b. It is also so absolutely mundane and fundamental to human experience that it is difficult for people to see what an astounding achievement it is. It should especially astound you if you are a physicalist, and assume that “all we are,” in some sense of “all”, is a collection of  $\sim 10^{28}$  hydrogen, oxygen, and carbon atoms.
    - c. Reference is also—and this will matter—not a *causal* phenomenon, in any simple sense. I can refer to you, without any causally efficacious or detectable “ray” of reference reaching or impinging upon you. Reference is also *fast*—I can refer to the sun, without my reference taking 8 minutes to arrive—or to Andromeda, without referential success taking 2.6 million years.
    - d. This non-causality of reference, as I emphasize to the students, is why you cannot build an app that would cause your iPhone to *beep* every time you were thought about.
    - e. *Even though there is a fact as to whether your high-school sweetheart is thinking about you at this very moment*, that is, *no one* can build an app to detect it—not even the NSA. They can't build it because “being referred to” is not a property that can be detected by a physical detector. (And I don't consider wiring up the universe with neuroscopes and broadcasting the contents of our thoughts on the internet a solution. The point is that there is a fact about your high-school sweetheart's thoughts *right now*. You either are or are not being thought about. “Only the universe knows.”)
  5. The most fundamental fact about words, thoughts, and other epistemic phenomena, I believe—i.e., about epistemic agents is that, without violating physicalism, and therefore in virtue, *somehow*, of their physical embodiment and instrumental scaffolding and cultural embeddings and Lord knows what all else—they nevertheless manage to establish these Brentano-esque “arrows of intentional directedness” (i.e., manage to refer) to the outside world.
    - a. Moreover—I think this is actually the same fundamental fact, though it may seem like a second one—as well as being able to refer, in this stupefyingly impressive way, to that which is other, we also try to *understand* that to which we refer—i.e., try not only to refer to it, but to name it, to describe it, to render it *intelligible*—and not only that, we try to get it right.
    - b. Reference and truth, if you are a philosopher (though whether Reference and Truth are two things or one thing is a topic for a paper—or a pint; not for this conference).
  6. So: we refer to that which transcends us—and defer to it (in the sense that “it wins.”)
  7. And that is nowhere more evident than in science: a deferential epistemic project to systematically

comprehend and take the measure of the world beyond us.

- a. Except of course, it is not *beyond us* in the sense of being outside us, “other,” or “over there.”
- b. It is beyond us in the sense of “more”: that which transcends us that that we are constitutively *in and of*.

## Part IV – Cognitive Science

### A. Intro

1. And so, as I said a moment ago, you could imagine that cognitive science would be an enterprise in which, as intellectuals, we reach out, and try to understand, how it is that people, or minds, are able to reach out, and able to try to understand.
  - a. A project of semantic engines trying to understand semantic engines, to use Haugeland’s phrase—or epistemic creatures trying to understand epistemic creatures, to use mine.
  - b. That is, if my characterization hold water, then cognitive science could, with humility and awe, direct its epistemic deference towards understanding how epistemic creatures *defer*, in order to be able to be normatively and intentionally be directed to that which transcends their grasp.
  - c. Lots of familiar topics would fit under this rubric, of course
    - i. Relations between propositional knowledge and other sorts (what can be, as it were, put into “articulated sentences,” vs. forms of knowing how fast you hit your second tennis serve)
    - ii. Procedural know-how vs. declarative
    - iii. Conscious vs. unconscious processing
    - iv. Roles of emotions
    - v. Etc...lots of familiar topics
2. But needless to say, this sense of a mind being fundamentally oriented outwards—normatively and semantically—is not exactly the cognitive science we inherited.
3. Instead, cognitive science has *narrowed* into something much closer to what the definition that Tom read this morning suggests: studying *physical* features, focusing on *information* processing, etc.
4. A cluster of facts conspired together to cause cognitive science to narrow like this.
5. Today I want to highlight just three.

### B. Causal explanation

1. Intro
  - a. Note, for starters, that natural science was never simply an attempt to study part of the world, *in whatever way it was best studied*—in whatever way would get at its constitutive regularities—in the sense that, were it to expanded its compass, it would take on other topics or aspects of the world, and in parallel expand its methods to suit, so as to understand other things in whatever way would best get at *their* constitutive regularities.
  - b. It is not just that science’s original *world* was limited, to causal/mechanical/physical phenomena, that is.
  - c. It’s method was limited, too—to providing *causal explanations* of everything that came within view.
  - d. Needless to say, we discovered that a great deal could be explained in causal terms.
  - e. Indeed, science was a huge success...so successful we are somewhat still in shock.
  - f. And we are still fitting things into causal explanation—most notably, recently, through evolution (which I decry as a “naturalistic” source of our normativity).
2. But consider something else that took place in the 20th century.
  - a. Among other things, the compass of science was expanded to include the subject matter of the

- rationalist* (not just *empiricist*) tradition: *logic, reasoning, language, theories, etc.*
- b. This incorporation of logic and reasoning and language and such into the compass of science has had enormous consequences
    - i. Not incidentally, moreover, it is this move out of which computing and computer science were born.
  3. Two options
    - a. Now given, as I have said, that there are aspects of logic and reason and epistemic phenomena (like truth and reference), that aren't evidently causal in any simple sense, there were two options that computing (and then cognitive) science could have taken.
      - i. First, it could have recognized that mechanical (*causal*) explanations are insufficient in terms of which to understand its new subject matters.
      - ii. It could therefore have tried to *expand science* to deal seriously with what is ultimately a form of *relationality*—with non-reducible, non-causally-efficacious relations that, even if they ultimately supervene on the global physical configuration of the world, nevertheless cannot be reduced to physical facts, but nevertheless play an essential role in any humanly intelligible account of the world.
      - iii. That is, computer and cognitive science could have *changed science*, or gone on strike until the Universal Academy of Science opened up scientific explanation to bless non-causal relationality in this way.
      - iv. That is: one way or the other, they could have propelled science into a less methodological-ly hidebound enterprise I will call “Science 2.0”
    - b. But of course this is not what happened—not what they did.
    - c. Rather, they subsumed everything into the causal-explanation requirements of Science 1.0—in a complex, and ultimately rather perverse, way.
      - i. Computer science not only began to deal with logical, semantic, intentional phenomena, which had for centuries been recognized as falling on the epistemic side of things: *language, reference, data, variable, interpretation, syntax, semantics, identifier, information, etc.*
      - ii. Not only that, they continued to call them *reference, data, interpretation, semantics, etc.*
      - iii. Rather than retaining what those words had classically meant, bowing to the dictates of the causal / mechanical orientation of science, computer science *redefined every one of these words, giving them new meanings—meanings which refer exclusively to echt, causal stuff!*
      - iv. The net result is that I have lost the ability to speak to anyone in C.S. about anything that I think is genuinely epistemic—because there are *no words I can use which mean, for them, what it is that I am talking about.*
      - v. It is not just religious vocabulary we have lost, that is. We have lost our epistemological vocabulary as well.
    4. So that's the first reason why we don't have the wider version of cognitive science I suggested above: computer science's reconfiguration of all semantic and epistemological terms to mean and refer to purely causal phenomena.
  - C. Second
    1. The second reason arises out of another 20th c. development—this one having to do with our understanding of science, rather than our scientific understanding of the world.
    2. In particular, it became increasingly clear, as the century wore on, that our scientific *take* on the world is not innocent.
      - a. Far from being neutral, transparent vehicles—pellucidly transparent glasses—through which we obtain a conceptual picture of “how nature is”. our scientific theories and accounts give us a



- picture of the world—note—“through a glass darkly”.
- i. Issues of interest, and practicality, and funding, and cultural perspective, etc., inevitably intervene.
  - ii. Not only what we know, but even *how we know what we know*, including *the very framing of the understanding that we have developed of that which we do know*, is affected by, is more culturally bound than, what is recognized in science’s founding mythos.
- b. We could talk about the rise of multicultural awareness, feminist voices, etc.
  - c. We could talk about McLuhan, interestingly, whose bringing media to our attention fits into this, I believe.
  - d. But the bottom line is that all sorts of people got together to drive nails into the coffin of the “pure, “objective” [in quotes], value-free notion of a view from nowhere.”
3. Now my sense is that most scientists working today, or at least a significant fraction:
    - a. Would acknowledge that the vastness and strangeness of the world defies being “captured,” in anything like a complete or absolute way, by humanly interpretable categories, and
    - b. And would admit that our take on the world is not innocent.
    - c. Nevertheless, however, they would still claim to be—and, I believe, by and large *still are*, driven by a deference to the world beyond them—a world they remain committed to understanding
    - d. *Deferential epistemic directedness* is still the rule, I believe, in scientific practice—even if it is culturally bound and in a number of ways contingent deferential epistemic directedness .
- D. Cognitive science
1. How has this second complicating incident—a recognition of the non-utter-transparency of scientific understanding—affected cognitive science?
    - a. Now you might think, to back to my dream, that the results just articulated—(i) not only that our “take” on the world is paltry, compared to what is the case, but also (ii) that, as well as being modest, our “takes” are *located*, culturally bound, etc.—would only have *increased* cognitive science’s interest in epistemic directedness.
    - b. Thus, on the image I am suggesting, we might have extended our understanding of the mind in order to develop an understanding of how it is that different cultures, voices, projects, etc., affect our ways of parsing or rendering the world intelligible—and how these diverging epistemological “takes” do more or less justice to the norms governing this or that project in which they are engaged, but all ultimately defer to the same unutterable world.
    - c. But this, too, of course, is not what has happened.

## Part V – Blanket materialism

- A. Intro
1. And so we need to consider the third thing that has stood in the way of this vision of cognitive science.
  2. This third issue, I believe, cuts the deepest, showing that the situation is far more dire than I have yet suggested.
- B. ...
1. Perhaps because of the success of science, the strategy of “let’s restrict our attention to just those things that are causally explicable” has now taken root in all kinds of fields within the academy—and outside the academy, for that matter, though that is not a topic for today.
  2. Moreover, the stance is not just one of saying “let’s restrict our theoretical attentions”, or “let’s restrict our attention as regards those things that we believe will succumb to scientific explanation”—in full recognition of the fact *that to do so is to restrict one’s attention*.

3. Rather, what has happened, in my experience, is far more profound. People, in my experience—perhaps especially students—have implicitly said to themselves: “let’s restrict not just our scientific theorizing but our complete imagination and understanding of *what exists* to those things that are causally efficacious—to those things that can be recorded on a video camera. (A video camera will not *record* reference, of course—since, as I keep saying, referential relations are causally effective, and therefore don’t cause the photo-detectors in the camera’s detector to fire.)
  4. The restriction is no longer just an ontological restriction, or a methodological approach, but has turned into a metaphysical position—this restriction of ontology itself to that which submits to causal explanation. I call it **blanket materialism**. (Actually blanket *mechanism*, but for reasons we needn’t go into here.)
  5. A note for philosophers
    - a. Blanket materialism is not *physicalism*, as that word is understood in contemporary philosophy. I am approximately a physicalist, too—but of a “global-supervenience variety”
    - b. Blanket materialism is not *eliminative materialism*, either, as *that* word is understood in contemporary philosophy. It is closer to that than to physicalism, but it is even more thorough-goingly materialistic. *Eliminative materialism*, in the way the term is usually used, denotes a stance towards the *mind*, and denies the existence of certain mental states, including epistemological ones. Also, eliminative materialism is generally an approach or commitment that suggests something like, but stronger than, *reduction*—that instead of licensing talk of mental states, of the sort constitutive of “folk psychology,” we should instead employ the conceptual framework provided by neuroscience or some other *lower-level physical account* of the brain.
    - c. Blanket mechanists, however, are adamantly opposed to anything that smacks of *reduction*. It is not that they would take mental states, such as wanting to be generous to one’s partner, to be something that should be eliminated in favour of some neurochemical description of the brain. Rather that they would take generosity itself to be a thorough-going material phenomenon—not something that *supervenies* on physical facts, but that is *itself constitutively causal*.
    - d. But my main point—as evidenced in the writings of Latour, Deleuze, and untold others—is that while the reductionist part of physical reductionism has been roundly rejected, the other half of physical reductionism—namely the *physicalist* part—is being ever more strongly *endorsed*. In terms of providing an alternative to the haunting spectre of the world collapsing to atoms in the void, in other words—the spectre of mythic mathematized natural science subsuming everything in its path, including all that is human and sacred—blanket materialism escapes one of the two dimensions, and throws itself unhesitatingly onto the other. Sure enough, it may not be reductionist—but, even if described in urbane post-structuralist prose, blanket materialism sees the world as naught but bumpings and shovings—the world projected onto the wall of the causalist’s cave.
  6. Blanket materialism, I believe, has gathered a large from of the academy in its clutches—including much of science and technology studies, and critical theory, and other social science and humanities fields. (Semantics isn’t even taught in either of the our philosophy departments first two courses in logic, I have been told.)
  7. And more pertinently, blanket mechanism has infected cognitive science. Goodness knows, in spite of everything I can do, I am failing to convince undergraduates that semantics even exists (or rather: that the word ‘semantics’ could name anything other than patterns of causal intra-action among symbols inside heads).
- C. OK, finally we are ready to get to why people scream.
1. I pointed out that there myriad voices, over the last several decades—in science studies, critical

theory, and other areas—have raised critiques against the supposed purity, neutrality, value-freedom, “view from nowhere” originating conception of science.

2. So far, that’s OK. I too don’t believe in a “science from nowhere”—in the idea that science is “objective” according to many people’s understanding of that term (which I might say, I find very shallow. I continue to believe that objectivity is enormously important—but it is not *that*. “Tell me about this objectivity you don’t believe in,” I want to say to such people. “I doubt if I believe in it either.”)
3. The problem, however, is that the critiques are not formulated as sensitive recognitions of the cultural dependence and pragmatic contingency of science’s deferential epistemology. Instead, they are framed in blanket materialist terms—thereby critiquing epistemic directedness entirely. That there is no absolute, univocal, fully-nature-comprehending science (which is obviously true) is instead voiced as “there is no truth at all.” That there is no univocal epistemic account is turned into “there is no legitimate epistemic perspective at all.” That there is anything we defer to *other than power relations* is denied. And so on.
4. Science (and presumably thinking and mind, to boot), these people say, are merely materialist projects governed by interest, power, and might. Of course it is not put that way; it is put in Foucauldian or poststructuralist terms, of entangled and imbricated causal intra-action. But *au fond* we are back to the behaviourists’ “bumping and shoving”—except that we can intervene now; we no longer have to stay on the outside.

## Part VI – Conclusion

- A. It is obvious where I am headed. Three morals, in particular (just to be tellingly Christological):
- B. First, science in its conduct, and cognitive science in its subject matter (and therefore we, as cognitive scientists, in two ways), should recognize two profound humilities:
  1. ☐ The world transcends us, and our comprehension—in more profound ways than we ever imagined—even if, at the same time, that transcendently magnificent world is what we are *of*, what we are *in*, what we are directed *towards* (making it immanent as well).
  2. ☒ The ways we *take the world to be* are inevitably inflected by our local participation in the world. We do not escape our particularity, our modesty, our locally-buffed circumstances, in order to view the world from without.
  3. Or to put it as simply as possible:
    - a. We’re not all that’s here (≡ the fundamental truth of realism)
    - b. But we *are* here (≡ the fundamental truth of constructivism)
  4. We should know that, in our science. We should also recognize that *knowing these things* is constitutive of being a mind.
- C. Second, again in both conduct and subject matter, we should recognize—and value—the deferential stance towards the world that undergirds all of epistemology. Cognitive science in particular should recognize that the epistemic capacity constitutive of mind is a normatively-laden, “beholden” relation to the world, not fully explicable in causal terms.
- D. Third, cognitive science in particular might take as their project something like this: to understand how “creatures made of clay” can not only be deferentially oriented towards that which transcends them, but also how it is that such creatures *have—and do—recognize that that towards which they are deferentially related outstrips their own comprehension*.
- E. One final comment—about that pesky term ‘world’
  1. When it all started, the world of science may have been thought to be restricted to the *physical* world.

2. It wasn't obvious, back then, what relation that physically-conceived or physically-conceivable world bore to the totality of that that is—to all that exists.
3. It still isn't obvious. Debates continue to rage—and opinions to differ—about whether mathematics, and reason, logic, types, scientific laws, and a passel of other things, are *part of the world*—and if so, in what sense.
4. Moreover, two things are clear:
  - a. First, it is hard, any longer, to justify that our intellectual knowledge, at least, and perhaps our scientific knowledge as well, is—or even should be—restricted to *part* of the grand totality of what there is. If for no other reason, that is so because it seems increasingly impossible to divide the world, intelligibly, into two.
    - i. For Descartes it was easy. He thought that *spatial things* (*res extensa*) were subject to scientific explication, but that mind was non-spatial (at least not spatially extensive). But he certainly recognized that the mind was *temporal*. He would be astonished, I expect, if we were to exhume and revive him and tell him that space and time have been discovered to be constitutively inseparable.
    - b. Second, if it is cognitive science's task to understand the *mind*, and if, as I believe, epistemic capacity is fundamental to mind, then our "science", at least, cannot be restricted to the causal, or to the physical. Indeed, it cannot be restricted *in any way whatsoever*—since whatever minds think about, then if we are to take the mind's epistemic directedness seriously, we must be able to understand *minds thinking about those things*. It follows that, as cognitive scientists, we need to be able to refer—deferentially, with humility—to anything to which minds can refer. This is a metatheoretic mandate of enormous consequence.
  - b. Perhaps an even simpler way to refer to it than TW, in order to index the determinateness of the reference but simultaneously pay homage to its unqualified nature, would simply be "The." It is a suggestion I made 20 years ago, but I have to say it hasn't caught on...
5. So by 'world' in everything I've said, above, I think we need to mean "*everything that is.*"
  - a. I sometimes call this "TW", as an ambiguous acronym for "the world" or "that which"—in the sense of *that which we refer to*, or *that which exists*, or *that which surpasseth all understanding*, or something along those lines.
  - b. Perhaps an even simpler way to refer to it than TW, in order to index the determinateness of the reference but simultaneously pay homage to its unqualified nature, would simply be "The." It is a suggestion I made 20 years ago, but I have to say it hasn't caught on...
6. But words aren't the point—any more than were the religious myths and stories. The point is that if we are to develop an epistemologically sound conception of an epistemologically-drenched and oriented mind—something, I might say, from which I believe that contemporary cognitive science remains, alas, a very long way away—then, to circle all the way around, there is little, in my mind, that the religious traditions wrestled *with which we should not wrestle as well*.
  - a. Not with *minds being religious*, though that as well.
  - b. But with *questions of ultimacy themselves*.
7. And needless to say—though I have been saying it throughout—in order to do justice to that which matters most about the epistemic character of mind, we must both embody, in our own conduct (as practitioners of Science 2.0?), and also recognize as constitutive of our subject matter, *deference to, humility in the face of, and awe towards that which...*

