I will eschew the customary \textit{precis} as Bob Brandom has already provided a
deft presentation of many key facets of my book. Instead, let me mark out several
of my baseline philosophical motivations, as these can become obscured within the
book’s “baggy” expanses. In truth, there are several familiar White Whales that I
pursue doggedly throughout, but my readers can easily lose track of my long range
ambitions while trudging through the book’s equivalents of Melville’s descriptions
of how blubber is rendered.

Years ago, following the lead of Hilary Putnam’s early work, I became
convinced that we could learn much about human conceptual behavior if we
examine how macroscopic terminology successfully adapts itself to real world
complexity within the annals of scientific history. But Putnam himself quickly
forged a doctrinal partnership with Saul Kripke’s contemporaneous views on
quantified modal logic. The latter had been seeking a story of language that could
justify the logical behaviors predicted within a certain formalism and it proved
very convenient for these purposes to assume that the references of many
predicates neatly attach themselves to well-behaved “natural kind” properties
through initial baptismal acts without need of descriptive intermediaries in
Russell’s fashion. But it became increasingly obvious to me that Putnam’s marriage of convenience with Kripke’s project was ill-advised, because

(1) the alliance anticipates that language will evolve along rigid and improbably tidy developmental pathways where logical concerns improperly dominate non-logical inferential issues

(2) it appeals to hypothetical processes of “tuning to natural kind properties” that cannot operate so simply at the macroscopic level.

Let me outline, in starker form than I did in the book, some basic mathematical reasons why this is so.

In dealing with any physical system $S$ of macroscopic size, there is a clear need to reduce the huge number of descriptive variables needed to characterize $S$ fully at a microscopic level. There are many different strategies that can be attempted here. Suppose that $S$’s full behavior requires the huge variable set $A_1, A_2, ..., A_n, B_1, ..., B_m$, where the $B$ quantities adjust only in some imperceptible and slowly varying manner relative to the “faster” $A$ variables. Sometimes we can reduce our descriptive set to more manageable proportions by “freezing” the $B$’s into ersatz constancy. In the sequel we simply ignore the $B$’s and work with the $A$’s alone. But when we do this, subtle changes (that I call “property dragging” in the book) are apt to affect the physical correlates of the $A$ vocabulary.
Here is a simple example. When a billiard ball rolls across a table, very complex interactions between ball and table are activated, whose rich details still represent an issue of intense scientific concern. But we commonly “reduce our variables” by treating ball and table top as completely rigid and cataloging the factors that impede the ball’s progress as “frictional forces.” As we do this, something funny happens. In actual fact, a rolling ball typically lengthens its own path by stretching the table top to a visually imperceptible yet non-negligible degree. This elongated route allows the true frictional forces $f$ arising from the table to perform a greater amount of work against the ball in its journey from X to Y. When we freeze the table top into rigidity, this supplementary work gets shifted over to the table’s “friction” budget as an adjusted value $f^*$, even though, from a microscopic point of view, some of this $f^*$ does not originate from true intermolecular forces at all. In other words, the seemingly innocuous act of evoking the constraint of rigidity silently operates as a kind of semantic switch that automatically adjusts the physical correlate that attaches to the term “frictional force” in a subtle manner. To the best of my knowledge, the magnitude of this crossover effect was not properly noticed until the work of Tabor and Bowden in the 1950's, although close analogs with respect to fluid viscosity were noted long before.¹
To a degree I didn’t fully recognize when I wrote my book, such semantic adjustments prove practically ubiquitous whenever a constraint of macroscopic import is employed to reduce a set of descriptive variables. Indeed, a lot of recent mathematical work demonstrates that the peculiar multi-valued behaviors described in the book (which, in turn, necessitate the “atlas”/”facade” constructions that Brandom sketches) represent a common side-effect of variable reduction under constraints. The mathematicians describe these drifts as the “anholonomies” that emerge within the “fiber bundle” constructions that naturally arise in the course of effective variable reduction. The familiar Foucault’s pendulum of the science museums supplies a classic paradigm of this phenomenon. Let us erect a large pendulum within the atrium of our museum and keep its bob swinging for a long period of time. As the day wears on, the pendulum seems to slowly “rotate” within the building (a fact usually dramatized by allowing the bob to knock over little pegs as it “turns”). In point of fact, the pendulum’s plane is not rotating relative to the fixed stars, because it has been constructed in such a way that the earth’s turning does not affect its orientation (the terrestrial revolution does drag the pendulum with it, but the process leaves its directionality unaffected in the manner of a gyroscope). Instead, the intermolecular forces that hold the earth together slowly twist the museum floor away from its alignment with
the pendulum, with the surprising result that, after a complete day and night cycle, the pendulum winds up swinging at an unexpected angular displacement $\theta$ relative to the spot on the floor where the motion commenced (if the experiment is performed at the equator or poles, however, the bob will return to its “original position”). We naturally regard the “position of the museum floor” as remaining constant, but, in doing so, we tacitly freeze many slowly varying relationships into fictitious “constancy.” In the course of this “freezing,” we adopt the trait **staying in alignment with the floor** as our instinctive standard for remaining in the same state over time (such a reduced variable standard for “remaining in place” constitutes what mathematicians call a “connection” $\Gamma$). Trusting to this naturally induced $\Gamma$ standard of “same state” over the course of a day and night cycle, we are surprised to find that the bob winds up displaced by a sizable angle $\theta$ from the “position” where it had started, because we have wrongly expected that the pendulum + earth system will return to its original joint “state” after a complete rotation. **FIGURE 3** This puzzlement traces to the geometrical multi-valuedness that secretly attaches to the “reduced variable” standards $\Gamma$ we have adopted for “same state” (if the term “floor position” had not been “frozen” into constancy, we would have noticed that the museum floor slowly but continuously alters its own “state” throughout a day’s cycle). In fact, our new “connection” criterion $\Gamma$
reattaches the physical significance of the phrase “position of pendulum plane” to what I call a quasi-quantity in my book: a multi-valued form of informational package more complex than a straightforward physical property. Such referential reattachments represent a common side effect of following the guidance of some natural “reduced variable” conception of “same state.”

In my book I spend a good deal of time arguing that, despite these logical oddities, such “quasi-quantities” represent a very useful sort of data registration, to the degree that it would be practically impossible to purge our everyday conversation of reference to naturally occurring quasi-quantities. Indeed, the utilization of quasi-quantities needn’t occasion great logical consternation—we must only learn to be on our guard for the long range anholonomies to which such vocabularies are heir (the devices that physicists and engineers employ to keep complex-valued representations on track provides the basic prototype for the special handling that quasi-quantities require).

I have highlighted these mathematical issues because they starkly warn that it is practically impossible to persuade vocabulary well suited to macroscopic applications to conform to the simple behaviors expected by philosophical logicians: one can suppress or ignore factors like “property dragging” and “multi-valuedness” for long periods of time, but they nonetheless remain intrinsic features
of our “reduced variable” descriptive environment, whether we like it or not. We certainly do not have a right to credit phrases like “water,” “shape” or “force” with single-valued full extensions in the logician’s sense, because we will eventually need to confront their “reduced variable” character in the course of fleshing out these supposed sets with real life n-tuples (of course, many philosophers are content to talk about “extensions” schematically until the cows come home, but, at some point, somebody really should try to fill in the blanks). Many descriptive variables of a macroscopic disposition can be expected to display multi-valuedness and allied anomalies, simply because of their basic “reduced variable” constitution—the mathematics intrinsic to their circumstances commonly demands it. In ordinary life, we often fail to observe these features largely because our everyday descriptive talk is so heavily contextualized that most immediate applicational clashes remain hidden from view.  

For the philosopher, these theoretical considerations suggest a new picture of the origins of the puzzlements that frequently engender developed philosophical doctrine: they arise, not because proper linguistic rules or norms have been violated, but through the natural Γ-like drifts to which macroscopic vocabulary is unavoidably prone. Indeed, I think my book’s most original innovations lie in its attempts to rescue J.L. Austin-like resolutions of standard philosophical difficulties.
from their implausible reliance upon “prevailing standards of correct use” (I’ll mention a specific example of this kind of project at the end of this essay).

Brandom asks why I am disinclined to address the “fundamental traits” of physics in an allied manner. The argument we have just rehearsed depends crucially upon the fact that *macroscopic vocabularies* must function as efficient sets of “reduced variables,” with all of the peculiar logical features that this task incurs. We have no comparable grounds for extending these expectations to the richer sets of *micro-variables* in which a more fulsome vein of physical description can luxuriate. I appreciate that philosophical anti-realists would like to take solace in the data I present in the book, but, in doing so, they drop out the vital qualifier “macroscopic” that stands in the forefront of how I conceptualize matters.

In any case, such considerations suggest that it will prove a rare occasion when useful macroscopic vocabulary actually evolves into the tidy predicate-“natural kind” property alignments that Kripke’s logical program requires. Any close examination of the stock examples of Kripke/Putnam lore reveals crucial complexifying details that have become obscured through a mixture of inattentive schematism (of the same sort as plagues “extension”) mixed with a reliance upon potted and self-reinforcing histories of science. If one tries to unpack the loose metaphor of an organism gradually “tuning” its linguistic responses to the world’s
traits as time goes on, one recognizes that the firmest benchmarks of irreversible improvement often arrive in the form of what I call “newly recognized strands of practical advantage”: inferential techniques that facilitate the improved performance of desired tasks. Here is a non-linguistic analog of what I have in mind. When I was in high school, a friend of mine (Dick Fosbury) stumbled across an unexpected routine for executing the high jump known today as the “Fosbury flop”: the jumper goes over the bar backwards, performing a specific sequence of bodily twists as he goes. Fosbury worked out this routine through trial and error, but in more recent times mathematicians have devoted a good deal of attention to “control problems” like this, seeking the optimal improvement within an allied family of routines. Fosbury, in fact, had opened up a new branch within the range of possible high jump routine, FIGURE 4, which modern track-and-field athletes have continued to refine and improve ever since. In the book, I describe many cases where trial-and-error experiments with descriptive vocabulary (“force,” “red,” etc.) initiate fresh branches of effective algorithmic pattern which thereafter serve as nucleating sites that constrain and steer subsequent linguistic developments. A usage that “tunes” itself to nature in this manner is not likely, pace Kripke/Putnam, to end up in a state of tidy predicate/physical property correlation. But then, the mathematical behaviors scouted above suggest that it
would be impossible to do so in any case.

These colluding considerations underscore an important methodological moral that may not have been illustrated sufficiently starkly within the book: philosophers have regularly accorded conventional logical structure a larger role in the semantic shaping of language than it properly deserves. The specific reasoning routines that get first rewarded in Fosbury flop fashion are rarely “logical” in character—indeed, they may contain no logical terminology whatsoever (consider any stock computer “numerical method”). And, if they do, loyalty to stock logical rules may hinder their effective operation. Here is an analogy to illustrate the basic situation\(^6\): left to its own devices, logic has planned the thoroughfares of reasoning in tidy, Midwestern regularity, but the uncovering of a new branch of algorithmic utility now looms over the town like a cranky giant, liable to stomp on any unhappy reasoner who ventures outside of the syntactic limits he has decided to impose. \textbf{FIGURE 5} In such a situation, you should be fearful of detaching an “P” from a “P & Q” even though logic alone assures you that it is okay.

As I describe at some length in chapter eight of my book, in the fulness of time we can eventually learn to relocate our logical streets so that they will skirt the giant’s shadow, but this usually requires that we first produce an improved understanding of the word/world correlations that prop up the algorithmic utilities
we have blindly discovered (I call this revised view of word/world arrangements a “semantic picture” in the book). Philosophers must appreciate more warmly that assigning a “semantics” to a language is not simply a matter of justifying the strictly logical validities within a language; we must also consider what happens with our more powerful reasoning methods under the correlations as well.\(^7\) In a nutshell, such considerations explain why an unbiased Putnam-style investigation of how words struggle to find effective worldly correlates should not entangle itself with a priori demands that the story wind up with a prescribed happy ending. But such “tidy outcome” demands comprise the essence of the Putnam-Kripke alliance.

“Pragmatic” approaches to conceptual content are often dismissed on the grounds that we usually require an array of “concepts” in place before we can ably develop sensible plans to utilize a vocabulary effectively (pursuing a “strand of algorithmic advantage” obviously represents a “plan” in this sense), so that the “contents” of our concepts can’t sensibly descend in a secondary way from the employments of the language.\(^8\) There is much that is correct in this vein of anti-“meaning is use” complaint, but it is too absolutist in character, as I believe the mixed developmental models in my book reveal. Putnam-style studies of the history of science reveal many cases where “plans” were developed on the basis of
conceptual modeling that later proved deeply in error, although the inferential schemes themselves were quickly rewarded in their practical applications.

Philosophy has created lots of headaches for itself by treating “conceptual grasp” as if it represents a unitary activity—vide our critic’s assumption that “pragmatism about concepts must be either right or wrong”—when, in fact, we are confronted with shifting slates of human behaviors that display influences from all sides. We are often taught that it is the “philosopher’s job” to offer simplistic theories of “what concepts really are,” rather than patiently untangling the individualistic snarls of behavior that comprise their apparent masses. But we should have never allowed the word “concept” to harden into such a refractory glob of glass. We should liberalize our expectations for what an “analysis of concepts” should look like without, at the same time, addressing the objective notion of “physical property” in a similarly deflationary manner (I would criticize Brandom’s own approach in the latter regard). Physical properties should not be thought of as merely “concepts” that Mother Nature has decided to instantiate, a misconception that I believe still lingers even within the Kripke-Putnam approach to “natural kinds.” My discussion of these vital issues appears largely in chapter five, which may not have represented its optimal placement.

As an aside, let me observe that it strikes me as a scandal that few
philosophers who chatter about “the metaphysics of properties” pay any attention
to the vast array of surprising facts that scientists have gradually uncovered since
the days of Fourier with respect to the physical means whereby macroscopic
systems frame large scale traits able to be detected and acted upon by other
macroscopic systems. For better or worse, my book has been written with those
studies firmly in view.

Brandom asks if I seriously intend my theories to be applicable to the
ordinary predicates of everyday classification. Yes, insofar as those predicates
serve chiefly as guides to matters of effective design and prediction. But it should
be strongly stressed that our use of words can be equally influenced by factors that
I scarcely discuss in the book and wouldn’t know how to catalog ably in any case.
Some common predicates, for example, seem to serve as instrumentalities of social
modulation in a fashion that proves far greater important than any transitory
classificatory utility they may display. Taking a cue from Robert Pippin’s Henry
James and Modern Moral Life, a term like “personal honor” might prove
delicately allied to hierarchical equilibrium structures within a society whose
prevailing standards sometimes require painful and uncertain adjustments as the
economic underpinnings of the group shift. I have no decided views on these
societal issues--I regard them as lying somewhat above my pay grade. In fact,
Brandom’s writings do a much better job in auguring how such interactive issues will commonly resolve themselves. I think he errs only in attributing *all* of language’s formative features to matters of societal commitment. My book concentrates upon what might be called “the Robinson Crusoe virtues” of language: the practicalities that would mold our enterprising islander’s employments of algorithms and tallies just as surely as our own public language is slowly shaped by these same standards of success and failure.

Let me conclude with a brief mention of one of those philosophical “white whales” that my book pursues, however clumsily. Recently, I heard a well-known philosopher offhandedly dismiss “Russell’s silly idea that we are somehow acquainted with the property of redness.” *Silly?* I would have thought that Russell was merely giving articulate voice to some of our deepest confusions about the nature of the mental: exactly the syndrome that Austin attempted to dispel in *Sense and Sensibility*. Only self-congratulatory zealots could fancy that any of us have yet turned this trick entirely successfully. In essence, my book’s contribution to this conundrum lies in its attempt to replace Austin’s “proper norms of English usage” with “multivaluedness driven by a natural macroscopic ‘connection’. The result engenders an Austin-like “disjunctivism” with respect to the physical information conveyed by the predicate “red” on its different occasions of
employment, but the origins of these shifting correlations are traced to quite different sources. In conversation, I have found that many readers have missed such cetacean ambitions within my book, partially because too many gallons of ocean separate chapter two from chapter ten and partially because the complexities of real life color word behavior indubitably exceed the capacities of the simplified developmental models I articulate. My excuse is that successful whale pursuit demands that large expanses of issues be patiently canvassed. In particular, the simplistic conceptions of “theory” with which most philosophers operate engenders a dense fog that makes it very hard to discern the crucial landmarks that I believe hunting down *redness* requires. Much of my book attempts to dispel these mists through the use of evocative examples that better capture, I think, the typical subtleties of successful descriptive practice.


3. Mathematicians picture the “fiber bundle” in which $\Gamma$ operates as a covering sheet that wraps around the earth many times; the “base points” of true position support the “fibers” that pierce through the covering sheet at $\theta$-shifted intervals. I believe that Barry Simon first suggested this way of viewing the phenomenon. Such ideas are closely related to the “Riemann surfaces” I discuss in the book.


5. Employing, in fact, many of the same “fiber bundle” techniques discussed above. Dick Fosbury was a fine fellow in high school, but he patently knew
nothing of fiber bundles.


10. I think my own view of “color experience” resembles that articulated by Anil Gupta in his recent Empiricism and Experience (Oxford: Oxford University Press, 2006). In my terms, a particular “color experience” acts the base point \( p \) above which a conceptual (or “propositional” in Gupta’s sense) fiber bundle sits. As ones “view” (and, I would supplement, ones present “context of investigation”) shifts, a natural connection \( \Gamma \) presses our conceptual classification of \( p \) to a different position within its fiber. However, I would never thought about such issues at all without Gupta’s direct stimulus.

11. Such issues of “theory” are extensively discussed in a parallel exchange with Michael Friedman to appear in a forthcoming issue of Noûs. I thank Michael
Friedman, Bob Brandom, Michael Liston and Mark Richard for the extensive and probing written commentaries they have provided on my book, as well as the helpful suggestions offered by Anil Gupta, George Wilson, Sheldon Smith and many others.