If Western civilization has a fundamental governing ethos, the idea of progress—whether couched in terms of material advance, improved health and wellbeing, religious redemption, or the catchall, “the pursuit of happiness”—claims primacy. To achieve these lofty, virtually metaphysical ideals has many footings, but key among them for the past 400 years are the instruments of rational thought. While science has enjoyed the greatest success of the rational ideal, political systems and social programs have sought to mimic the scientific standard. Radical postmodernists held a far more circumspect view, not only about extrapolating laboratory rationality to the social, but, more critically, human reason itself. For them, Reason, in its modernist incarnation, no longer holds its position as the arbiter of Western mentality, where knowledge, objectivity, truth, and rationality are housed in some standard version.

The modernist/postmodernist stand-off may be schematized by a duality of “rationalists” pitted against “anti-rationalists.” The key to the antirationalist program is certainly not irrationality or even a-rationality, but rather a resistance to a domineering “logo-centrism” that defines reality in terms of positivist understandings. On this general view, “modernity’s mistake” is seeking scientific explanation and order in subjective domains where it has no jurisdiction. Whatever order is imposed will in some way limit or even distort the knowledge derived from the logic operating in (imposed on) such a system. These divisions originate with the Romantic revolt against the Enlightenment that puts Kant in
the crosshairs of anti-rationalists (e.g., Kierkegaard, Schopenhauer and Nietzsche). By fin de siècle, the rationalists marshalled their forces in various alignments of positivism, pragmatism, phenomenology, and early analytical philosophy. And then with the swing of the pendulum, Heidegger gave new life to the anti-rationalist orientation, which in turn was countered by Adorno and the Frankfurt School. The contest was then renewed in the 1960s and 1970s with various German rationalist thinkers on one side (e.g., Hans-Georg Gadamer’s hermeneutics, Niklas Luhmann’s systems theory, and the neo-idealism of Michael Theunissen and Dieter Henrich), who sharply contrasted with the French anti-rationalists of the same period, exemplified by Lacan’s psychoanalytic theory, Foucault cultural historiography, and Jacques Derrida’s deconstruction of language. They were joined by a bevy of fellow travelers grouped together as postmodernists (e.g., Alain Badiou, George Bataille, Gaston Bachelard, Jean Baudrillard, Gilles Deleuze, Jean Lyotard, and Michel Serres). Their diverse attacks on the subject focused my own interest, and more broadly, much in the spirit of Heidegger’s project, their concerted effort attempted to dismantle structuralist thought, a thoroughly rationalist venture.¹

In this attempt to displace Enlightenment ideals of knowing and judgment, no final arbiter or standard remains foundational. The context of a decision, the options available, the relativist position of any initial assumption renders rational deliberation not only fallible but dependent on hidden considerations that Foucault dubbed “Power” and Freud called “unconscious.” Wary of misapplied argument, sensitivity to the complexity of inquiry has placed wide margins on what passes for rational deliberation. In other words, rationality does not equate with logic, and with that mindset, skepticism assumes a new-found prominence.

**On Reason**

To discuss reason in this context requires discerning at least three levels of application, which in too many instances have been wrongly fused. The rules of deductive reasoning and inductive consolidation in the laboratory represent different modes of thinking from either the individual thought processes of ordinary life behaviors or the process of social evaluation. To lump the inevitable vagaries in everyday human intercourse with the public scrutiny accompanying scientific conclusions is to project commonplace bias on to the far

¹ This short description is based on Martin Schwab’s summary account (1989).
more vigorous logic developed for investigating nature. Nevertheless, as discussed in the previous chapter, the Science Wars putatively revealed the vagaries bestowed by the social construction of knowledge and scientific pursuits won no exceptions.

The projection of Reason’s social and individual foibles on the scientific enterprise strikes me as assuming a skepticism more applicable to individual deliberations than collective ones. The communal critical enterprise does not equate to the psychology discerned in individuals. Parallel processes may operate, but the correctives operating in collective thought differ from the resources available to the individual. The two comprise different ways of thinking. However, as discussed below, a chastened positivism strikes me as credible, and the point is to provide a measured reflection on the ostensible ideals of scientific thought given the constructivist critiques. Simply, the Kuhnians cannot be so easily dismissed, not only for internal epistemological reasons, but because their position fits into larger cultural and political trends that claim their own legitimacy.

As attested by a significant portion of the American public, the ripples from post-positivist descriptions of scientific thinking reached far and wide. That some critics went too far does not cancel the general reevaluation. Psychologists have shown that reason’s application depends on contextual factors, and these may have subtle and not so subtle effects. If one looks for some basis for the postmodern view of reason, then one need only look to a rich psychological literature that has clearly demonstrated the bias intelligent people exhibit. Studies exposing the dynamics of unconscious irrationality and impaired self-awareness have shown how over-commitment to certain ideas may blind neutral judgment and logic may be kidnapped by hidden concerns. Seemingly trivial immediate prior experience prejudices logic and irrational choices are routinely made. What is rational depends on a cast of contextual elements, a general finding supported by extensive empirical psychology that has examined this issue, and as these change choices based on certain options must correspondingly change as well.2 Depending on the context, certain options

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2 Several theories vie for explaining the reasoning process. For instance, heuristics/bias theory (Kahneman and Tversky 2000); mental models theories—humans reason by constructing small-scale models of reality or map-like representations in semantic form (Johnson-Laird 2006); mental logic theory—reason reflects an innate logical capacity inspired by Jerry Fodor and Noam Chomsky (reviewed and modulated by Hanna 2006). Various permutations have spawned a large literature (e.g., Manketelow and Chung 2004; Millgram 2001; Stenning and van Lambalgen 2008).
become more, or less, important as selections are made with particular intentions in mind. Because logic may be fractured or even ignored, “rational” becomes something less than a tight syllogism. How a problem is presented becomes critical in forming undeclared assumptions and manifesting hidden desires or needs that may trump the logic of simple deduction. Another way of making the point, logic may not be entirely relevant to final decisions. Not surprisingly, illogical choice often dominates, as certain idiosyncratic heuristics may determine conclusions and hidden biases can easily distort interpretations and estimation of outcomes.  

Recognizing that human rationality does not function as some singular idealized cognitive faculty, reason becomes instrumental, a tool to achieve a goal, and goals may not either be explicit or even conscious. While humans obviously have varying degrees of intelligence, how that intelligence is exercised reflects processes extending outside formal logic to combine with wish, ideology, fantasy, and prejudice. It is only a small step then to conclude that a crucial variable in the calculus of rationality is not the rules of reason per se (i.e., logic), but rather the context created by myriad extra-rational factors within which reason must function. Personal history, bias, needs, and values—acknowledged or implicit—influences, if not determines, judgments. Thus, the conception of reason as functioning in some idealized rational realm is a conceit. Simply, deliberate logic follows established rules; human rationality does not. To riff on a well-known adage, what is reasoned (and true) in New York may not be reasonable (or true) in Kabul. And here, at the junction between logic and the application of rationality, the wedge of interpretation operates. And with that admission, positivism—true, certain knowledge—must revise its presumptions. The consequences of that modification in the Tower of Knowledge have been seismic.

The uncertainty of Reason’s standing has generated radical reevaluations of the social and political power structure formed and swathed in the rational discourses of the Establishment. The postmodern mantra, voiced in rebellion to

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3 This view has supportive experimental appraisals. When subjects are presented with standardized problems involving logical deductions, their choices are dictated by the context of the problem and the kinds of options open to them for making rational elections (Wason test). For a review see Hanna 2006. Classic studies collected in Kahneman and Tversky 2000; Gilovich, Griffin, and Kahneman 2002.

4 “When studying reasons, we study normative aspects of the world. When discussing rationality, we discuss our perceptions of, and responses to, reasons. Our ability to reason is central to our rationality in all of its manifestations, that is regarding reasons for belief, action, emotion, or anything else” (Raz 1999, 75).
the social order, claims that heretofore only certain kinds of knowledge for cer-
tain ends have held validity, and thus “logo-centrism” of dominant elites must
be displaced from its hegemonic control. Accordingly, “reason” is an instru-
ment of social power that must now be shared by others who possess different
forms of knowledge derived from different kinds of logic, and different values.
Indeed, “reason” becomes a political element, a kind of currency that may be
exchanged among various denominations.5

If one leans toward the postmodern alignment, a novel insecurity (perhaps
bewilderment) results when awakening from the Dream of Reason, where lines
of causation become indeterminate and the solidity of “facts” waver. Postmod-
ern criticism parades the indeterminacy theme as one of its central dogmas.
Such revisionist views about causality have supported an invidious attack on
the standing of facts and the theories based upon them. Whether fair or not,
extrapolations from quantum mechanics to the uncertainties of Weimar poli-
tics have been displayed along a continuum stretching from figurative analogy
to claims of strong correlation (Forman 1971). In this regard, a better under-
standing of how irrationality can take hold of the best intentions points to the
concepts of an idealized power of consciousness and contributes to the recogni-
tion that the image of human thinking is better visualized as a river raft buf-
feted by submerged rocks and rapids than as an edifice built upon steel girders.
The demands of functioning in currents that have fewer restraints and only
pragmatic solutions means those practical realities have replaced unreachable
ideals. If, in fact, utopian aspirations have been compromised, Western self-
consciousness has been fundamentally changed to something else. Those sym-
pathetic to this latest critique of modernity are left to determine this something
else within revamped ideals of Western notions of human agency.6

5 Meeting this social critique, Anglo-American analytic philosophers have discovered the dif-
ficult task of defining meaning, or even speaking logically once we become self-conscious
of the various linguistic and psychological traps common discourse suffers. And their Fran-
co-Germanic colleagues have complemented that result with their own deep skepticism that
spawned language’s radical deconstruction altogether. This vast literature may be parsed in
several ways, but basically meaning, reference, and ordinary language comprise the major cate-
gories. For introductions see, Lycan 2000; Martinich and Sosa 2012; McGinn 2015. The ear-
ly key analytical texts may be found in various anthologies, e.g., Caton 1963; Weitz 1966. For
more up-to-date readings see Moore 1993; Nuccetelli and Seay 2008. For representative re-
views of this analytic tradition and an overview of contemporary thought see Soames 2003;
2010; Stroll 2000.

6 The literature on this bevy of issues is seemingly endless. Useful introductions include Best
2011.
The general lesson from this wary view of reason pertains to how values, acknowledged or implicit, govern thought. And from that position only a small step then concludes that the variable in the calculus of reason’s function is not the rules of reason per se (i.e., logic), but rather the constellation of values in which reason ultimately functions. Kuhn made an important contribution to this general orientation, for his critique of science’s Rational Model of development opened the door to a more expansive understanding of how science evolves and the myriad factors at work beyond Reason as conceived in its idealized formulation. He upturned science’s Standard Model, and this had far-reaching consequences, nothing less than a revised understanding of rationality. However, a caveat must be made: to overstate the significance of a more limited regard for Enlightened Reason must be balanced with the just standing of science’s critical self-evaluation. Kuhn, during the late stages of his career, attempted to rescue a more traditional view of science’s objectivity by distancing himself from the radical constructivists, however, he had no control over the latitudes of the pragmatism he espoused (Kuhn 2000; Mladenovic 2017)

Despite extravagant extensions, a pragmatic orientation has taken hold. Pragmatists substitute practical standards of discourse and experimentation, in which some ideal of Truth and Objectivity have been displaced by more circumspect expectations. They opt, instead, for a demotion of such standards and accept working approximations that establish criteria for a discourse that accommodates the limits of such standards without relinquishing the power of the scientific enterprise. In studies of scientific practice, notions of the Scientific Method have been replaced with a conception of investigation undertaken through ever-shifting communal understanding of what constitutes bona fide evidence and its interpretation. We now consider the rationale for such a modest view with a summary of the writings of Richard Rorty (1931–2007).

RORTY

As already discussed, during the Science Wars, angry debate ensued when the discussion moved from describing the inter-contextualization of science and its supporting culture, an innocent sociological discourse, to far more radical assertions that led to radical attacks on science’s governing precepts. The most extreme postmodernist critique left science reduced to politics where an insidious relativism would reign. While the argument seemed to center on the status of scientific truth, a deeper subtext commanded attention: If the walls of the
laboratory were breached, Relativism would replace entrenched notions of Truth, and Truth remained a Holy Cow as conventionally understood. The question thus loomed: with whom would I align?

On the one hand, I was confident of the scientific knowledge I produced as a biochemist—unabashedly factual in the “old” sense. The success of science is precisely in the ability to model phenomena, both their mechanisms and the consequences arising from them. Achieving prediction and control is enough for the practicing scientist. The issue is always the degree of confidence and the latitude for revision and retrenchment. For the philosopher, the argument is not over the specific claims about the reality depicted, but rather on how we know and whether the mode of knowing determines what is in any final sense. Assuming that latter perspective, I am an “antirealist.” I would hardly argue against the reality of the world, its is-ness, but I recognize a realism that is bracketed by the limited ways of knowing that world and the strictures imposed by the cognitive structures of the mind.

The faculties of cognition are highly developed under the direction of a pragmatic telos oriented to establish predictability of, and mastery over nature. Descriptions of reality obtained by such means are highly reliable, but hardly infallible. Skepticism rules while results are used as tentative components of an ever-evolving conception of the Real. But the constructive elements of so-called extra-curricular factors and the larger metaphysics in which we operate, cannot be escaped. Fallibility is the watchword, so the cardinal issue for me is the tentative status of what we construe as true. And at this epistemological juncture, I found my own deflationary views in alignment with Rorty’s, the bête noir of contemporary Anglo-American philosophy.

Although Rorty had no significant following in my department, my friend Hilary Putnam (who often debated Rorty) respected him, and so did I. Much in the Wittgensteinian tradition, Rorty adopted a thoroughly pragmatic orientation, seeing scientific change as arising through unexplained paradoxes, unexpected findings, new vocabularies, and evocative metaphors resting on weak foundations. Science then became a process of “tinkering,” lacking assumed rules of rationality and thereby forfeiting the idea that progress follows some internal logic. However, progress does result, as assessed retrospectively, and the issue is not that scientists make no headway, but rather that the methods employed cannot be standardized. Nature and human cognitive faculties are simply too complex for such formalization. That lesson seemed reasonable enough, but Rorty’s major appeal for me was how he extended a Wittgenstein-inspired skepticism well beyond his views of science. I sought
guidance to employ the lessons I had learned from science studies to a more general philosophical orientation. Rorty provided those markers.

He saw himself opposing the tradition of “philosophy as a tribunal of pure reason” (Rorty 1979, 4) and instead he would regard philosophy as breaking free of its traditional search for foundations to serve a “therapeutic rather than constructive, edifying rather than systematic” function (ibid., 5). Rorty’s pragmatism thus holds “that what is rational for us now to believe may not be true…. It is to say that there is always room for improved belief, since new evidence, or new hypotheses, or a whole new vocabulary, may come along” (Rorty 1991a, 23). Intersubjective (community) agreement sufficed and thus replaced idealized notions of Truth and the Real. That view seems fair, more, it captures the acceptance of fallibility at the heart of the scientific enterprise.

Repelling the charges of relativism as any truth is equivalent to another or that “true” is an equivocal term, Rorty accepted consensual standards of practice. Accordingly, he held no theory of truth at all: “Not having any epistemology, a fortiori, he [the pragmatist] does not have a relativistic one,” (Rorty 1991a, 24) and much less a correspondence theory of truth (ibid., 22). And as for objectivity, Rorty was satisfied with what turns into a moral virtue. Pragmatists think that the habits of relying on persuasion rather than force, of respect for the opinions of colleagues, of curiosity and eagerness for new data and ideas, are the only virtues which scientists have. They [pragmatists] do not think there is an intellectual virtue called “rationality” over and above these moral virtues. On this view there is no reason to praise scientists for being more “objective” or “logical” or “methodical” or “devoted to truth” than other people. But there is plenty of reason to praise the institutions they have developed and within they work, and to use their models for the rest of culture…. My rejection of traditional notions of rationality can be summed up by saying that the only sense in which science is exemplary is that it is a model of human solidarity. (Rorty 1991b, 39)

Objectivity then becomes a product of social cohesion and consensus (i.e., “solidarity”). Accordingly, science is an example of “communal reason” at work. Sociologically informed critics, citing the fluidity of discourses between scientific communities and the ever-present opportunism of practicing scientists to enlarge their critical purchase on their investigations, regard reason as an active dialogue between actors (Pickering 1993; Shapin 1994). These players revise their thinking in response to the opportunities of debate and the incorpo-
ration of different kinds of knowledge. On this stage, the character of modern interdisciplinary science has challenged the older monolithic, formalistic accounts of scientific practice.

Rorty made a case that seemed eminently reasonable to me: truth-seeking becomes the search for understanding the world unencumbered with formal criteria of what constitutes knowledge. Instead of positing some timeless norms, he admonishes us to simply pursue an understanding of nature freed of a Platonic idea of Truth or Reality, and through communal effort, define the world as best we can. By adopting such an attitude, Rorty hardly dispels scientific knowledge, but he wants that knowledge freed of extraneous, and unnecessary metaphysical baggage.

The concepts we assign to truth statements comprise the constructivist domain, for the standing of truth (final, contingent, deflationist, whatever) constitutes the ongoing practice, or problem, of science. From this pragmatic viewpoint, the entire enterprise is dependent on an evidentiary notion of truth. The realist, in stating the truth conditions of a theory cannot affirm whether those conditions are satisfied because even the best confirmed theories may still be false. Truth then becomes “some sort of (idealized) rational acceptability,” or essentially an epistemic notion based on our state of knowledge and thus not achievable in any finalized sense (Putnam 1981, 49). This deflationary position holds that truth has no essential feature, and indeed, there is no single robust property or underlying nature to characterize it. So, instead of searching for such an attribute called “truth,” the deflationist would argue that truth should be regarded as fulfilling an epistemological function as a guide for seeking correct or reliable statements in the effort to optimize certainty (Horwich 2005; Armour-Garb and Beall 2005). That is enough, for in terms of success, while aspiring to an idealized finality of Truth, scientific practice, pragmatic and dynamic, has proven itself capable of establishing standards adequate for its own pursuits.

The accomplishments of science are extraordinary by any measure, and that testament cannot deny reason’s authority. The issue is not that humans are irrational or cognitively limited in myriad ways, but rather self-appraisals and constant scrutiny are part of our rational apparatus. Because Truth and Objectivity cannot reside in some idealized insularity but must rather take on their meaning in the messiness of everyday life, does not mean that truth and objectivity become figments or even illusions. Rather, a new self-conscious awareness has set in to replace an older complacency, where modernist conceits are now seen as having exceeded unreasonable expectations, and we now must acknowledge the uncertainties with which humans have always lived.
I found Rorty’s deflationary views refreshing. Indeed, he provided a larger framework for my understanding of science, not as a means of achieving certainty, but as a way of approaching uncertainty. As proven in myriad ways, scientific methods are highly effective instrumental tools for exploring the world. Satisfied with pragmatic results, he relinquished Kant’s attempt to “mirror” nature (Rorty, 1979). Instead, Rorty recommended a thoroughly pragmatic approach to science, so that we worry only about the choice between two hypotheses, rather than about whether there is something which “makes” either true. To take this stance would rid us of questions about the objectivity of value, the rationality of science, and the causes of the viability of our language games. All such theoretical questions would be replaced with practical questions about whether we ought to keep our present values, theories, and practices or try to replace them with others. Given such a replacement, there would be nothing to be responsible to except ourselves. (Rorty 1991b, 41)

Following this general line, Rorty joined other antirealists, who have challenged those who believe that the quest for reality ever more closely approximates “the real,” i.e., that we are effectively approaching such ideals with the tools of reason—objectivity and neutrality. And despite the limits of our cognitive faculties, scientists effectively describe, manipulate, and ultimately apply their findings for human purposes. That is enough, for critical judgment is tempered by human experience bumping into nature and accommodating itself to those realities:

I think it’s important for pragmatists to say that the fact there aren’t any absolutes of the kind Plato and Kant and orthodox theism have dreamt doesn’t mean that every view is as good as every other. It doesn’t mean that everything is now arbitrary, or a manner of the will to power, or something like that. That, I think has to be said over and over again. (Rorty 2002, 375)

Simply, some descriptions are better than others, however, accepting well-established theories of science does not require accepting the metaphysical realist view that those theories correspond to some final picture of reality. Enough to regard truth as the best application of our collective intelligence.

Whereas in the positivist era the fact possessed an idealized status, constructivist critics have exhibited hidden assumptions and biased judg-
ment. On this view, although science has triumphed in placing its mark in both material and social contexts, it guides with more circumspect confidence, subject to new kinds of judicious evaluation. So, while science still claims its exultant epistemological status, its product, true knowledge, has become an approach to the asymptotic, or idealized limit. Instead of some finality, the pragmatist can be satisfied with practical results and the successes based upon them. On this view, beliefs have as firm a basis as can be established with pragmatic assessments. Of course, a “true” result may occur for the “wrong” reasons, but to say (as does Rorty) that truth only serves to order the scientific enterprise does not make true arbitrary. The attempt to reduce all knowledge acquisition to “just” interpretation and thus subject to relativism is simply wrong.

Rorty gave the truth screw another turn, one that attempted to strip philosophy of science (and much else) of any essentialist concepts. His critique was aimed at disarming metaphysics tout court and in that revamping of modern philosophy, he was not shy to throw Truth into the metaphysical discards. That effort reveals the radical logic underlying the upturning of a positivist point of view and the clearest target of the “defenders of science” who appeared during the Science Wars.

Rorty began a seminal paper, “The Contingency of Language” (1989), with a bold assertion, one that might serve as the introduction to a treatise on contemporary constructivism: “About two hundred years ago, the idea that truth was made rather than found began to take hold of the imagination of Europe” (Rorty 1989a, 3). That language is a contingent product of human thought and social interactions hardly constitutes a novel or even radical claim. However, Rorty would extend the contingency thesis into language itself to encompass all products of the human mind. On his view, science and the reality it reports is based on various contingencies that are human-determined and constructed. So, for Rorty, to describe the world, one of the most difficult “essences” to exculpate from this older metaphysics is Truth. And if Truth is contingent, the foundational bedrock of the Real is shattered and uncertainty ascends.

Rorty argued that the reality of the spatiotemporal world should not be confused with the claim that truth, i.e., the description of that world, is also

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For a discussion of “fact” and the constellation of values surrounding objectivity, see Tauber 2009a, chapter 2. For the historical origins and evolution of “fact” see Daston 1994. A shift in thinking quantitatively occurred before the Renaissance, largely originating in commercial dealings. Those developments then were instrumental in the development of modern objectification (Crosby 1997). The story continues along this thematic line in Poovey 1998.
“out there.” In other words, he differentiated truth claims from scientific descriptions and their interpretations. Rorty was quite specific that his target was not science but rather positivist philosophy, which in turn was part of his larger effort to present a pragmatic view of the world. From Rorty’s perspective, humans should accept that the commonsensical world is the result of causes that do not include mental states, like “truth,” a concept he regards as imposed on the reality reported. And from this position, truth acquires a new standing:

To say that we should drop the idea of truth as out there waiting to be discovered is not to say that we have discovered that, out there, there is no truth. It is to say that our purposes would be served best by ceasing to see truth as a deep matter ... as a term which repays “analysis.” “The nature of truth” is an unprofitable topic, resembling in this respect “the nature of man” and “the nature of God,” and differing from the “nature of the positron ...” (Rorty 1989a, 8)

Rorty thus assumed a radical anti-metaphysical, empiricist conclusion. For him, truth is a product of the human mind, it does not exist outside, independent, or free of the mind (ibid., 5). Truth then becomes a pragmatic standard, a guiding or regulative principle of the scientific enterprise without metaphysical standing.

In sum, for Rorty, truth-seeking becomes the search for understanding the world unencumbered with formal criteria of what constitutes knowledge. Instead of positing some timeless norms, he admonishes us to simply pursue an understanding of nature freed of a Platonic idea of Truth or Reality, and through communal effort, define the world as best we can. By adopting such an attitude, he warrants knowledge freed of extraneous and unnecessary metaphysical baggage. He allows that positrons are “real” as asserted by communal consent. That standard suffices as he rejects any essences, even, or perhaps especially, the “real.”

To conclude, Rorty attempted to clear philosophy of science of what he considered obstructing and unhelpful metaphysical baggage. Without direction, especially without pursuing some ideal truth or reality, or some optimizing fitting of human reason to the world, language becomes a platform for the development of new metaphors as reason seeks to navigate the world. Scientific reason then becomes only one of several languages used for this general purpose, and science, like its compatriots in reason’s house, functions in basically the
same way. On this view, a correspondence theory of truth must be replaced with a pragmatic one, as novel strategies and language form on demand to make that world (Rorty 1989a, 21). Indeed, truth is our (collective, consensual) own. A product of human industry, it is neither arbitrary, nor absolute, but comprises the evolutionary endpoint of human inquiry—contingent to its time and place and ever-changing as a result of answering communal requirements, pursuing collective ideals, and forging consensus, i.e., “solidarity” (Rorty 1991a; 1991b). And given our thematic concerns, we might now ask, How does certainty fare in such an epistemology?

**Comment**

In ways I did not expect, choosing science provided the intellectual scaffolding for parsing knowledge and assessing truth claims. For me, science remains the pinnacle of Western thought, and I consider my early ambition to learn how to think in terms of establishing hard facts in the laboratory as a personal accomplishment. In that endeavor, I found degrees of certainty simply unavailable elsewhere. Having that experience puts postmodernism in perspective.

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The Quine-Rorty critique of science derives from their shared opposition to the Viennese positivists’ insistence that only language is accessible to philosophical analysis, but Vienna hardly had foreseen the consequences of this position. Quine and Rorty jointly argued that:

1) Language is not pictorially related to the external world and thus cannot provide an isomorphic depiction of the world (“correspondence” theories of truth are therefore forbidden). Thus language (propositions) cannot represent or correspond to some final or ultimate reality (Rorty 1967).

2) Word meanings are derived from the context of their use, and thus meanings must be considered in the universe of rules, context, habits, and conventions that bestow meaning.

3) Different language functions must be differentiated (e.g., naming, classifying, commanding, prescribing, describing, referring, expressing, etc.) and not conflated.

And, perhaps most importantly:

4) Language cannot go “behind” itself since we would have to use either its own symbols or other symbols in an endless regress to describe language. Language thus offers us no Archimedean point in which to either describe language itself or the reality that language describes. Consequently, humans are left with the dilemma of understanding language’s structures as it serves as the vehicle of the mind’s exploration of the world. Reality may be viewed in alternative ways, not because the nature of facts depends on how we construe or understand them to be, but rather because there are no such facts except relative to some linguistic or conceptual framework within which we live.

In short, according to what Rorty called “the linguistic turn,” although much had been argued earlier by Neurath (Tauber 2009a, 96–98), language cannot be breached. Our judgments are embedded within the boat of our language and concepts. Our language only changes piecemeal, slowly, with no new design available. The architectonics of theory are similarly entraped.
As to the contingency of scientific advances and the truth claims made solely on pragmatic criteria, defenders of a normative view argue that discursive reason has developed within a long philosophical tradition, in which scientific rationality owes far less to a confident reliance on data, methods, and warrants than to the self-doubting Socratic “dialectic of interrogation” to which facts and theories are regularly subjected (Fisch and Bebaji, 2011). Incapable (as a matter of logic) of objectively confirming her efforts, let alone of proving them, the scientist can, in principle, boast no more than to have prudently subjected her work to the most thorough tests available. That knowledge is incomplete and must be scrutinized through the lens of skepticism, the key precept of critical investigation of all kinds. This epistemology serves science as it did philosophy from its earliest awakening, namely, relentless examination of complacent assumptions and beliefs.

The perfectionism of endless reappraisal governed by critical skepticism provides the scientist with the basic value of inquiry, a value that binds science to its philosophical antecedents. And success is reassessed through ongoing rational review. But how does such rational self-questioning function and upon what might it be based given the normative strictures in which we think? The relativist attack and the insecure standing of the normative have made this discussion central to a host of diverse discourses. I will not delve into this jungle of controversy and instead simply endorse a Rortian perspective: knowledge must be judged by the best efforts of communal reason at work. In this revision of positivist hopes, an ideal Truth is only that, an ideal. Sociologically informed critics, citing the fluidity of exchange between scientific communities and the ever-present opportunism of practicing scientists to enlarge their critical purchase on their investigations, regard reason as an epistemological “catalyst” between actors. These players revise their thinking in response to the opportunities of debate and the incorporation of different kinds of knowledge. Upon this stage, modern interdisciplinary studies of science have changed the older monolithic, formalistic accounts of scientific practice (see various essays in Jasanoff et al 1995; 2001; Hackett et al, 2008; Felt et al 2016).

I lament that some critics have seized upon the “weakened” notion of truth and would relativize knowledge altogether. A major distortion is made when

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9 SSK’s (sociology of scientific knowledge) “strong” program maintains that “there is no sense attached to the idea that some standards or beliefs are really rational as distinct from merely locally accepted as such” (Barnes and Bloor 1982, 27). This relativist position advocates a philosophical study of knowledge acquisition with the so-called “equivalence postulate,” where “all beliefs are on a par with one another with respect to the causes of their credibility. It is not that
laboratory practices are then regarded as paralleling the deconstruction of literary texts with the inversion of meanings and loss of authorial authority to become a rhetorical agonist field (Latour and Woolgar 1979). On this view, the inferential logic used to test hypotheses in the laboratory is no different in kind than subjective judgment. I utterly reject the argument that the informality and debates characterizing interpretations of scientific experimentation and model-building mimic the hermeneutical exercises found in literary or art criticism. Strictures on construction differ among disciplines. Claims made in the natural sciences may be adjudicated on the anvil of evidence of reproducible phenomena. And the success of that empiricism cannot be denied.

Where to draw the borders of justified doubts became the critical issue of contention during the Science Wars, where the high-cost stakes appeared in clear relief. Undoubtedly, Science dethroned would provide a rich reward for radical postmodernists, for the argument reached into the very depths of contending ideologies. I do not want to wander into those caverns here and suffice it to offer a summary judgment: Putting aside the more extravagant postmodernist claims, with the ebb of the epistemological conceits held by the positivists, a broad and sustained sociological critique of science has deconstructed the Rational Model of scientific advances and with it some purveyor of Truth. Those disciplines based on scientific methods, most importantly social theory and historical analysis that claim their legitimacy by mirroring scientific methods, have profitably undergone renewed scrutiny. Aside from failing the methodological standards of the natural sciences, social and historical narratives are increasingly indicted as inescapably contaminated by bias and distortion. 10 That general critique has encircled all academic disciplines, which to my mind is a healthy balance to unexamined assumptions and complacency.

Although I have not been persuaded by the hyperbolic rhetoric nor by what seems to me the extravagant claims, much worthwhile insight has emerged.

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10 For instance, when Hayden White attempted to dethrone factual truth for idiosyncratic narrative and pervasive ideology by declaring the relativism of historiography, he released a torrent of criticism of positivist historiographies (White 1973). Jacques Derrida initiated a similar revolt in literary criticism. The key texts of his *annus mirabilis*, 1967, are Derrida 1974; 1978; 2011. His influence extended not only through literary criticism (e.g., Cisny 2014; Dirk and Lawlor 2014), but also appeared in related fields, including studies of contemporary biology (e.g., Kay 2000).
Post-positivist thought introduces an epistemological humility that deserves wide endorsement. The ceaseless scrutiny and self-criticism demanded in the laboratory remain instilled in my own ways of knowing. Thus, I regard myself a “hyper-modernist” (in distinction to a “postmodernist”), namely, one committed to ceaseless re-examination of reasoning and reason. To overstate the consequences of a more limited regard for Enlightened Reason distorts the bona fides of rationality. Yes, science functions, as do all knowledge acquisition systems, with constructivist elements—pragmatic, opportunistic, eclectic, and interpretive. Yes, even in physics what is understood as important is framed by priorities set not only by the scientific community but also by the policies of government support. In the life sciences, clearly certain ideologies have contorted research (e.g., Nazi and Stalin genetics), and discarding these historical examples as extraordinary, we cannot deny how research agendas cannot escape the political winds swirling round the laboratory. These elements cannot be ignored, but as a philosophical matter, I cannot construe my own biochemistry and cell biology research in line with SSK’s strong relativist position that, in the most extreme case, leaves the rationality governing science in shambles.

I reject this thesis. I am fully aligned with the experimental logic and the operative objectivity at work in “normal” science. Yet, I also fully acknowledge that in my studies of immunology’s development, I invoked a strong constructivist element by demonstrating how the self metaphor served a critical function in organizing mid-twentieth century immune theory. At that level of discourse, I showed that a cultural element had been introduced to describe functions that did not have a fully developed mechanistic basis. Such innovative use of language, drawn from a shared culture, serves as a proto-model for phenomena that could not be defined in more concrete terms. In the case of the immune self, the epistemological claims made on its behalf could not be upheld. A new relational construct appeared with the move towards an ecologically oriented immunology. And with that development, we witness different notions of identity emerging. We may easily extrapolate this case study to a wider consideration of reason at work. Exposing the anatomy of a metaphor does not then reveal a compromised logic, for underneath such descriptive language a critical

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11 Polanyi’s writings reiterate the need for scientific research to proceed under the sole direction of investigators, who, as a collective society of “truth-seekers,” he thought were the best judge of what constitutes the appropriate agenda of study (Nye 2011, chapters 5 and 6). That position came under forceful rejection in the 1960s as a result of the scrutiny of critics who argued that social and political interests must be acknowledged and either empowered or rejected in consideration of the larger social agenda in which the science is being applied (Tauber 2009a, chapter 5).
intelligence operates. Rather than exhibiting postmodern insecurities and skepticism, I regard the immune self story as illustrating the vibrancy of scientific reasoning. We do not employ some universal template, but rather resort to pragmatic, pluralistic approaches to grasp phenomena and conceptualize them with a diversity of cognitive tools. The lesson is plain. Metaphors are not false; they are useful when their functions are understood.

I am emphasizing this point because I believe the relativism of postmodern criticism applied to science has exhausted its most radical claims. What remains is a more modest lesson: Instead of some idealized rationality that had served the Enlightenment ethos, pluralism now reigns with diverse values informing deliberation. And here a crucial distinction must be made between what occurs in the laboratory in contrast to the use of science in society-at-large. The spectrum is wide, extending to the application of scientific findings for legislation (e.g., policy to minimize climate change) to the interpretation of evidence for individual life decisions (e.g., abortion). The line separating science and politics may be twisted to suit the exigencies of ideology (Tauber and Sarkar 1993; Tauber 1999c). When politically expedient, intrusive restrictions on scientific independence may be applied. We need not review Nazi race theory or Soviet genetics to cite examples, since the Bush and Trump administrations had no compunction in exercising their own distorted interpretations of scientific findings when beneficial to their own doctrinal commitments (Mooney 2005; Plumer and Davenport, 2019; Tollefson 2020). In dissecting those applications, we witness a derivative of a complex calculus of language, social interests, historical contingencies, and cultural parameters operating in the political domain. Yes, but the internal logic of scientific deliberation remains largely insulated from such influences as testified by the outcry of scientists distraught by the manipulation they witnessed.

Postmodernity no longer appears as a novel cultural phenomenon. A bevy of newly minted labels have been proposed for a new twenty-first century cultural movement driven by the internet, digitalization, and cyber-technologies. Assuming various labels (e.g., “post-postmodernism,” “metamodernism,” “digi-modernism,” “trans-postmodernism,” “post-millennialism”) radical cultural, social, political, and cognitive changes are forecast. However, some see a new humanism emerging, a shift beginning to counter the excesses of postmodernity by returning to modernity’s Enlightenment project. 12 Maybe. How can we

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12 A representative manifesto is Alan Kirby’s “The death of postmodernism and beyond” (Kirby 2006; 2009; for review, see van den Akker, Gibbons, and Vermeulen 2017. In her review of
distinguish between a new trajectory and the swing of the pendulum (following Horkheimer and Adorno 1993)? If the latter, how wide is the arc and what tempo does it follow? Much too early to predict. In any case, irrespective of such speculations, the uncertainties bestowed by the postmodern critiques are not easily dismissed. Indeed, they continue to churn, having melted solid assumptions of yesteryear.

While postmodernism commanded headlines for a generation, the dust has settled, and I think it time to re-assess the significant shift in cultural, artistic, and self-identifications following in its wake. These may be summarized as residing in an insecurity in which, as Marx said, “all that is solid melts into air” (Berman 1982, 15). And what is the source of this uncertainty? On my view, the postmodern ‘state of being’ is not based on accepting the epistemological claims made by radical critics of science, but rather resides in the disjunction created by the dominance of science as the modality of reality in opposition to other ways of knowing. Some kinds of irrationalism are necessarily combatted by objectified logic, but other forms of subjectivity have been challenged by the objectification of the world. How do I fit in? On what basis is ethical choice made? What is the moral structure of the universe after God’s funeral? These are questions firmly lodged in the personal dimension and to better understand the source of these vexing questions, I examined their historical origins. And doing so eclipsed the borders of dispassionate inquiry, for I discovered that my adolescent conundrums enacted a cultural story that began with the romantics and has continued into our own era under the guise of postmodernism. The remaining chapters of this narrative present the intellectual diary of how I traversed this territory.

current American literature (ca. 2005), Mary Holland (2017, 11–17) places the origins of literary postmodernism in the aftermath of World War II. That work, as reflected in other art forms and coupled to critical theory and philosophy, is characterized by a pre-occupation with the limits of language and the ambiguities of representation, reference, and meaning. She believes that late capitalist culture is currently transitioning to a “post-postmodernism” characterized by a re-awakening of a literature with a decidedly humanist, interpersonal ethos. For summary of this shift see Holland’s “Conclusion: Metamodernism,” (ibid., 199ff.), where she argues that a major current of contemporary literature reflects “a re-orienting of postmodernism and its attending literary concepts of poststructuralism, turned toward the Enlightenment project of modernity … operating in a modernist vein through postmodernist literary techniques turned towards modernist goals: metamodernism” (ibid., 201). For putative post-postmodernist developments in urban planning and culture criticism, see Gans 1993; Turner 1995; Akker, Gibbons and Vermeulen 2017.