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Commentary on Mark Weinstein's "Two Contrasting Cultures"

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1. THE MODEL OF EMERGING TRUTH

In Part 1 of his paper, Weinstein elaborates a meta-mathematical model which, taking physical chemistry as its paradigm, attempts to represent in a rigorous and transparent manner the interconnections of those features in virtue of which prevailing theories in the natural sciences come to be seen as entrenched or anchored—that is to say, as epistemically well-grounded. The features in question are functions of the development of those theories over time, and concern

- (i) the extent to which over time applications of a theory T (conceived of as a series of models of T generated by interpreting T as applicable to specific, more limited domains) have steadily improved the empirical fit between T and the data it attempts to explain,
- (ii) the extent to which over time applications of T to *new and different* domains exhibits the same sort of steadily improving empirical fit between T and the data it attempts to explain,
- (iii) the extent to which over time what T says has been explained by better and better “reducing” theories which reinterpret the expressions of T in a way that illuminates what T is “really” about—for example, coming to understand or explain the correlation between the pressure and temperature of a gas in an enclosed container as described in Boyle’s law by equating temperature with the mean kinetic energy of the molecules making up the gas and equating pressure with force exerted by those molecules on the walls of the container.¹

¹ Weinstein’s account does not deal explicitly, it seems to me, with an important fact about typical reductions which Sellars called attention a long time ago to, and which is well illustrated by the kinetic theory of gases as applied to Boyle’s law. Sellars points out that “theories” typically explain why “empirical laws” are successful to the extent that they are successful, but also explain why they fail at the points at which they fail. Boyle’s law, taken literally, predicts a straight line correlation between pressure and temperature. As a matter of empirical fact, this is contrary to what is observed. A graph of observed values with temperature on the X axis and pressure on the Y axis is a straight line up to a certain point, after which pressure values do not keep pace, as it were, with temperature values. The kinetic theory explains this: as temperature increases (i.e. as the velocity of the molecules making up the gas increases) collisions between the molecules becomes more frequent, and most such collisions increase the time it takes for the

Weinstein claims that his model of emerging truth can help explain the varying strength of the *warrants* which Toulmin had claimed connect the premises of an argument to its conclusion. This is made possible by

- (a) construing a warrant as a substantive generalization of the sort David Hitchcock showed us how to identify as the “covering generation” of an argument and
- (b) viewing such generalizations as “explanatory consequences” of some theory T, where the strength as a warrant is a function of the extent to which T is embedded or anchored in virtue of the 3 sorts of features just described.

On the basis of his model, in Part 2 he defines a series of 5 statuses a theory can have—each status in the series representing a higher greater degree of entrenchment. It is by reference to these statuses that he formulates three “dialectical principles”—whose root idea is that the dialectical obligation of someone who holds a theory T to account for an anomaly gets weaker as the status of T increases.

As with *any* bold and interesting attempt to deal with a significant problem, there is plenty of room to quibble about the details.² However, in my view, this is a deep and

colliding molecules to reach the sides of the container, thereby retarding the increase in pressure. I suspect Weinstein (who actually mentions this example in 2006b, p. 58) would see this simply as a case in which reduction, in a *sense*, increases empirical fit, but I see it as more than this—as a case in which reduction induces *revision* of the theory being reduced (i.e., in one way or another alters the sentences of T). Analogous issues arise if we see the relation between Newtonian mechanics and both the special (STR) and general theories of relativity (GTR) as a reduction relationship, or as analogous to a reduction relationship. What Newtonian mechanics says about computing the velocity of C in relation to A on the basis of the velocity of A in relation to B and B in relation to A (namely, that you simply add the two latter velocities) is, from the perspective STR, is at best only *approximately* correct, and is not even approximately correct for situations in which velocities approach the speed of light. What GTR says about gravitational force *contradicts* what Newton’s inverse square law says about gravitational force, even though it explains why the values generated by the inverse square law are approximately correct in many circumstances.

² I personally have reservations about at least three of the details of the story as Weinstein is currently telling it. (1) As far as I can see, on Weinstein’s model a theory can achieve a better and better empirical fit only as a result of varying interpretations of the *same* set of sentences (it is differing interpretations of the same set of sentences which generate the sequence of models which may or may not exhibit a better fit). To my mind, this is counterintuitive. I much prefer Lakatos’ (1970) account, according to which what is judged to be progressive is a *research program* in which many (perhaps all) of the sentences put forward change over time, even though the core idea which defines the research program remains the same. On Lakatos’ account, the criterion of progressiveness is not necessarily goodness of empirical fit (which can easily be achieved by ad hocery), but whether the adjustments made to accommodate anomalies yield overall theories which, among other things, make new and previously unforeseen predictions that turn out to be true. *Perhaps* what this indicates in an *interaction* between what Weinstein calls being “model progressive” and being “model chain progressive.” (2) Weinstein, like Hitchcock (and unlike Toulmin, I maintain) appears to *equate* warrants with covering generalizations of the sort that Hitchcock identified. My view is that, as Toulmin (2003/1958, p. 98) said, a warrant is “is a *general moral of a practical character*, about the ways in which we can safely argue in view of” the facts put forward as backing for the warrant. See Pinto (2006, section 5, esp. pp. 298-300) for my view on the form a warrant should take. Weinstein might want to accommodate this point by construing nomic generalizations after the manner of Sellars (1963, chapters 10 and 11) as essentially rules of inference. (3) In a parallel account of MET, Weinstein (2006a, p. 54) has said, “Truth, in the final analysis, will be identified with the progressive appearance of a model that deserves to be chosen,” invoking Peirce’s view of truth as “the ideal limit to

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promising account of the interconnections that are relevant to the assessment of any contemporary attempt at serious natural science. Anyone interested in argumentation theory owes it to himself or herself to make the effort to become thoroughly familiar with it.³

Weinstein (2006b, p. 81) has said

The intuitive appeal of the construction [...] is based on accepting the brute fact that mature physical science is the most effective epistemic enterprise available, and thus a likely paradigm for a theory of truth [...]

But it remains to be seen whether and to what extent his model will prove illuminating when applied to inquiries outside the realm of physical science. There are two reasons why I am less than sanguine about its prospects for illuminating the epistemic status of theories and/or accounts in what Dilthey called the *Geisteswissenschaften*—roughly, the sciences or studies that deal with human things. First, to a considerable degree what Dennett called “intentional explanation” remains central to the explanatory potential of such inquiries (for starters think of history, economics, current cognitive psychology) and, as Dennett⁴ and Davidson⁵ both make clear, intentional explanation is not oriented by the sort of nomic generalizations which

which endless investigations tend.” Like many others, I am sceptical of the notion of a limit—ideal or otherwise - toward which “endless investigations” are tending. To put the matter in other words, just as I am sceptical of the concept of a being than which no greater being can be conceived, I am sceptical of the idea of a model than which no better model could be conceived. Of course, the concept of truth must be accommodated in *some* manner or other—but ought not, I think, to be accommodated in this manner. However, I find what I take to be Weinstein’s idea that judging a theory T from the perspective of successor theories—and most particularly from the perspective of a reducing theory R which reveals what T was “really” about—can shed important light on the concept of closeness to the truth (Popper’s “verisimilitude”).

³ For those willing to make that effort, I would personally suggest that a good place to start is Weinstein 2006b, followed up with Weinstein 2006a.

⁴ For Dennett (1981, p. 6), one adopts the “intentional stance” toward a system when one assumes the system’s “rationality” (which for Dennett equates to optimal design) and “one predicts behavior [...] by ascribing to the system *the possession of certain information* and supposing it to be *directed by certain goals*, and then by working out the most reasonable or appropriate action on the basis of these ascriptions and suppositions.” In other words, what guides us from the ascription of information and supposition of a certain goal to the conclusion about what the system will do is *not* an empirically grounded *nomic generalization* to the effect that entities possessing such-and-such information and having a goal of a certain sort always or usually acts in such-and-such way. What guides us is rather our estimation of *what is it is reasonable or appropriate to do* in light of that information and that goal.

It is worth stressing that Dennett (*Ibid.*, p 15) also says, “Intentional theory is vacuous as psychology because it presupposes and does not explain rationality or intelligence.” For more on the significance of that remark, see the second paragraph of note 6 below.

⁵ Davidson (2001, p. xvi) says that in “Actions, Reasons and Causes” he accepts

the view that teleological explanation of action differs from explanation in the natural sciences in that laws are not essentially involved in the former but hold[s] that both sorts of explanation can, and often must, invoke causal connections.

In “Mental Events,” Davidson (2001, p. 224) goes even further and endorses “the Principle of the Anomalism of the Mental: there are no strict laws at all on the basis of which we can explain and predict mental phenomena.”

are central to the explanations recognized by MET and which Weinstein wants to equate with warrants. And second, I'm aware of hardly anything in the realm of the Geisteswissenschaften that I would consider a successful *reduction* in which a reducing theory sheds significant light on the *ontology* of the theory that's being reduced.⁶

2. WEINSTEIN ON POLITICAL ARGUMENT

Let me set out what I think Weinstein is saying about political argument and political discourse in Part 3 of his paper. He distinguishes three sorts of claims or conclusions operative in such discourse:

- (a) those licensed by warrants whose backing lies in broad political (or ideological) perspectives

⁶ At one point Weinstein (2006a, p. 67) does in fact note the “hope that mental predicates can be reduced to states of the central nervous system”—citing Churchland 1988. But those like the Churchlands who look to neuroscience for “ultimate explanations” of psychological phenomena are not proposing to reduce the referents of “folk psychological” predicates to states of the central nervous system; like Skinner and Watson before them, the Churchlands look forward to a future in which science will be able to *eliminate* the folk psychological terminology still employed in today's mainstream cognitive psychology in favor of a scientific vocabulary which avoids them altogether. Skinner's view was that it isn't the business of the psychology as such to speculate about the neurological underpinnings of behaviour—to oversimplify slightly, scientific psychology should be concerned only with the influence of environment on behaviour, and should brook no speculations about “intervening variables” that mediate the interplay among behaviour, reinforcers and discriminative stimuli. The Churchlands view, on the other hand, is that psychology ought to aim at explanations of behaviour which rely on neuropsychological constructs which are largely yet to be identified. As things presently stand, in those areas where current discoveries about the functioning of the brain and the nervous system are throwing important light on human behaviour, thought and emotion, cerebral and neurological states and occurrences can rarely be *identified* with “mental events,” though they are readily seen to be *causes* of various *aspects* of our cognitive and emotional lives. However, as Jerry Fodor keeps pointing out, for the most part the *only* explanations of concrete behaviour currently available to us are in terms of belief, desire, etc. According to him, belief/desire explanation is “the only game in town.”

It is worth noting that Dennett (1981, p. xx of the Preface) explicitly aligns himself with eliminative materialism in certain respects. Thus says that “beliefs, desires, pains, mental images, experiences” as ordinarily understood are not “good theoretical entities.” He says that *some* ordinary mental entity terms—but *not* those just mentioned—may “deserve mention in a mature psychology.” About those—and about “the theoretical entities that eventually *supplant* beliefs, desires,” etc., in a mature psychology he is, he says, a “homuncular functionalist.” One can get a sense of the direction in which he is moving when he says (p. 12), “In the end we want to be able to explain the intelligence of man, or beast, in terms of his design, and this in turn in terms of the natural selection of this design.” And it needs to be recalled that he had earlier said (p. 4),

The essential feature of the design stance is that we make predictions solely from knowledge or assumptions about the systems *functional* design, irrespective of the physical constitution or condition of the innards of the particular object.

If these sentences capture the thrust of Dennett's research program, he does not envisage fleshing it out with appeals to neuropsychology.

With respect to these issues, consider also the arguments Davidson (2001, pp. 214-25) mounts in “Mental Events” in support of “anomalous monism”—the view which holds that all events are physical, but “rejects the thesis [...] that mental phenomena can be given purely physical explanations” (p. 214).

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- (b) those licensed by “normative tending warrants, ranging from prudential requirements such as policies on cost value analysis to more deeply intractable commitments as in substantive moral constraints (equal opportunity, specific rights, appeals to the common good)”—about which Weinstein has little to say here
- (c) those licensed by warrants whose backing lies in social and political facts and theories—these include (i) warrants “grounded in law and other de facto political policies,” (ii) warrants “drawn from and by analogy with social science principles, sociological, psychological and even anthropological claims that proffer generalizations of various strengths about human behaviour” and (iii) warrants whose backing lies in economic fact and theory.

Having distinguished these phenomena, there are two central points he makes about the first and third.

1) Broad political perspectives

leave little room for rational negotiation, since they result in parallel perspectives, equally persuasive to their adherents, but relatively incapable of creating consensus [...] (p. 9)

- 2) Discussions which eschew appeal to broad political or ideological perspectives appeal instead to “shared backing and available economic models.” Weinstein thinks that the merits of proposals made “in light of such backing” *can* yield to “rational negotiation.” He thinks that their merits can and should be assessed in light of the dialectical principles described in Part 2—which, of course, presuppose his theory of emerging truth.

I think Weinstein is absolutely right to call attention to the difference between political arguments that turn on appeal to “broad political perspectives” and those that don’t, and is correct in his explanation and assessment of the futility of such argument in the public sphere. Moreover, I think he is right to suppose having a model *like*—or, as I would rather say, *loosely analogous to*—MET would help us in understanding what is at stake when we try to assess proposals which appeal to “shared backing and available economic models.” However, in light of my remarks above about the Geisteswissenschaften, I remain sceptical about how much light a model which takes physical chemistry as its paradigm will be able to shed on the assessment of such proposals.

3. WEINSTEIN’S POSTSCRIPT

In his Postscript Weinstein says,

The best we can hope for is a broad liberal education that permits of the evaluation of expert presentations based on a basic familiarity with the field and its arguments along with a spirit of critical inquiry.

He connects this point with McPeck's rejection of the very idea of a course in critical thinking or (what is not the same thing) informal logic. Indeed Weinstein concludes with the words, "informal logic as a quasi-formal discipline is impossible." It seems to me that none of this is warranted by the fact that "evaluation of expert presentations" must be "based on a basic familiarity with the field and its arguments." To what "field" does *that* point, and the arguments for it, belong? Surely both arise from an examination of argument as it occurs in a broad variety of different fields as well as argumentation that transpires in "the public sphere," an examination carried out against the background of the literature produced by a certain research community—that is to say, from informal logic. Of course, introduction to or mastery of informal logic does not *suffice* for evaluating expert presentations made by physicists, or chemists, or theologians, or clinical psychologists. Indeed, that is one of the main ideas to be got across in a course in critical thinking or informal logic, And at *my* university such courses are the *only* place a student is likely to encounter notion that he or she *needs* a broad liberal education of the sort Weinstein has in mind.

[Link to paper](#)

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