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Commentary on Michael Scriven's "Probative Inference"

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1. INTRODUCTION

In 1986 at the first ISSA Conference in Amsterdam, straight off a plane from Australia, Michael Scriven gave an invited lecture entitled "Probative Logic," rendered with that speaker's customary exuberant intelligence and stentorian disapproval of the laggardly and unreflexively orthodox. It was an outstanding performance, one of the first articulations within the CT/IL community of the analytical forces that were gathering unruly strength in computer science artificial intelligence. As far as I can tell, Michael gave voice to these ideas on his own and without direct contact with the various developments in default logics, systems of nonmonotonic reasoning, defeasible inheritance logics, autoepistemic and abductive logics, circumspection logics, truth-maintenance systems, theory update logics, preferential reasoning logics, to say nothing of logic programming and the likes of Prolog.

The main idea of the Amsterdam talk was that the establishment paradigms came nowhere close to covering the reach of human reasoning; that beyond the narrow confines of the logics of deduction and statistico-experimental induction, there is an incipient third logic directed to the various kinds of reasoning that rightfully deliver their conclusions with something less than deductive tightness or—in the technical sense of the term—inductive strength. What was especially valuable about Michael's proposal was his insistence that there was nothing subpar or second-or third-best about this third type of reasoning, that it too had "the quality or function of proving or demonstrating" a conclusion (hence the name "probative"). It is a striking idea, largely because it could possibly be true if "proving" and "demonstrating" are given the senses imposed on them by the mainstream logics. What Michael was saying is, in effect, that mainstream logic had high-jacked the notions of proof and demonstration. In his, we can only be reminded of Stephen Toulmin, who levelled the same charge against the appropriation of the idioms of probability by purveyors of the applied mathematics of games of chance.

It is easy to see the appeal that Michael's talk would have had for the Amsterdam conferees. For weren't they, too, of the view that the analysis of human reasoning was too much to ask of the deductive and inductive paradigms? Since Amsterdam, a certain picture of how best to proceed with the theory of reasoning—whether deductive, inductive or probative—has emerged. It is the way of the systematic analysis of

argument. But this was not Scriven's way in 1986 and it is not Scriven's way now. Scriven is a probative logician but he is not an argumentation theorist, except intermittently, that is to say, in those particular cases in which reasoning is intrinsically argumentative. This sets up an interesting question. How, if you are not an argumentation theorist, is the theory of probative reasoning to be done? And where, these twenty-three years later, is this probative logic or this family of probative logics to be found?

Concerning the second of these questions, let me quickly dispose of a not altogether unnatural suggestion. Given that "there is still a burgeoning industry in AI studying nonmonotonic logic [and the like],"¹ why not turn to AI for our probative logic? I daresay that Michael would like John Pollock's response to this suggestion.

Unfortunately, their lack of philosophical training led AI researchers to produce accounts that were mathematically sophisticated, but epistemologically naïve. Their theories could not accommodate the varieties of defeasible reasoning humans actually imply [...] [T]his coming remains to the present day.²

What, then, of the first question. What would (or should) a non-argumentative probative logic look like? What are its chief analytically constitutive features? This is a tough question subsuming a large task. In the time available to me it is not possible to take it on. So let me confine myself to a smaller question. What analytically constitutive features of a probative logic have been introduced and/or developed by Michael Scriven? (After all, it is twenty-three years later). Pleading again the press of time, I'll deal with just two of them. They are

- The concept of *normic* or generic propositions.
- The concept of *selection-explanation* or inference to the best explanation.

2. NORMICITY

Michael has spent the lion's share of his intellectual life doing battle against orthodoxies that had got too big for their britches. In 1959, he took baleful issue with the received view of generalization and general propositions.³ Generality lies at the heart of human reasoning, where so much of what we're up to is generalizing to and instantiating from general propositions. As briefly as I can put it, Michael noticed that both science and everyday life are replete with general propositions having neither the logical form nor semantic profile mandated for them by the orthodoxy. Consider, for example, "Ocelots are four-legged."⁴ Perhaps its most distinctive semantic feature is that there are true negative instances in the face of which it remains true (say, that Ozzie the ocelot is only three-legged). Accordingly, it is not a universally quantified conditional statement. It is of a different logical form.

¹ John Pollock, "Defeasible reasoning." In: J. Adler and L. Rips (Eds.), *Reasoning: Studies in human inference and its foundations*. Cambridge and New York: Cambridge University Press, 2008 p. 452.

² John Pollock, "Defeasible reasoning" p. 452.

³ Michael Scriven, "Truisms as the grounds for historical explanations." In: P. Gardiner (Ed.), *Theories of History*, pp. 443-475. Glencoe IL: Free Press, 1959.

⁴ Earlier recognition to the same effect was Cooper Langford's "The institutional use of 'the,'" *Philosophy and Phenomenological Research*, 10 (1949), 115-120.

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What is the significance of this for human reasoning? Consider the case at hand. Given that ocelots are four-legged and Ozzie is an ocelot there is a correct default inference for you to draw. It is that Ozzie is four-legged. But, as you now see, Ozzie is three-legged. If the general premises had been a universally quantified conditional statement, you would have made two mistakes. You would have been wrong about Ozzie and you would have been wrong about ocelots. But since the general premise is in fact a normic proposition, you have made only one mistake. You were wrong about Ozzie but you were right about ocelots. The economics of this set-up speak for themselves and they lend weight to a further normic generalization, which is that

By and large, human reasoners generalize to and instantiate from normic propositions, not universally quantified ones.

This is not expressly in “Truisms as the grounds for historical explanations” but it is certainly incipiently present. I regard it as a discovery of the first importance for the logic of human reasoning.

3. SELECTION-EXPLANATION

Selection-explanation has a longer pedigree than normicity, occurring in Michael’s D. Phil. Thesis of 1956. Perhaps it is not precisely what Gil Harman was on about nine years later in his “The inference to the best explanation,”⁵ but it is a near thing all the same, something undoubtedly in the same family. Another piece of orthodoxy that Michael was doing battle with was the deductive-nomological model of explanation. But there is also a related issue, itself somewhat contentious as to whether or not evidential force is truth-indicating. (Damn, I was nearly going to say “probative”!). Consider this rather coarse-grained schema of a selection-explanation inference:

1. The orbit of Mercury is perturbations.

If it were true that a planet—call it Vulcan—existed unseen at such and such place in the heavens, then this would explain Mercury’s orbital perturbations.

2. So, let us provisionally make of Vulcan a working hypothesis.

There are two points of importance to notice here. One is that it doesn’t matter for the tenability of this reasoning whether explanatory force is or is not truth-tracking or “evidentially clinching” (Geoff Goddu). What the schema relies on is merely the *subjunctive* claim that if Vulcan were to exist, it would explain the perturbations. It does not say, and need not say, that Vulcan *does* explain them. The other point of interest is that the conclusion is *not* probative in Michael’s preferred sense, which is meaning number two of his New Oxford American Dictionary. The premises don’t have “the quality or function of proving” that Vulcan exists. Rather, they have “the quality or function of rendering the Vulcan hypothesis worthy of exploration, that is, exploration on

⁵ *Philosophical Review*, 74 (1965) 88-95.

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sufferance. And this, according to Michael's dictionary, is the first meaning of "probative"—"exploratory."

Abduction—which is the generalization of selection-explanation inference—is at least as central to human reasoning as generalization. Michael's anticipation of its structure well over a half-century ago is a large achievement. And if, in later years, he misnamed it as "probative," it is only the slightest of errors. For the *name* is right; it is only its primary sense that requires reinstatement.

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