cjgwright@gmail.com

Bergamo/Pavia Masters seminars
May 29 - June 7 2024

"Epistemology and Mathematics", Module 2 00
The Basic A Priori — Logic and Arithmetic

Handout 2: Quine v. the apriori; Quinean "anti-exceptionalism"

Quine in *Two Dogmas* again:
Any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system. Even a statement very close to the periphery can be held true in the face of recalcitrant experience by pleading hallucination or by amending certain statements of the kind called logical laws. Conversely, by the same token, no statement is immune to revision. Revision even of the logical law of the excluded middle has been proposed as a means of simplifying quantum mechanics; and what difference is there in principle between such a shift and the shift whereby Kepler superseded Ptolemy, or Einstein Newton, or Darwin Aristotle? [1]

(Quinean) <u>Anti-exceptionalism</u>: two principal, distinguishable claims:

Corroboration —that the epistemic good-standing of logical principles is properly earned in the same way as the confirmation of all empirical scientific laws. We are justified in accepting such principles by, and only by, their participation in on-going successful scientific theory.

Rejection —that, as with scientific hypotheses, logical principles are one and all in principle open to rational rejection or revision on purely empirical grounds if the system in which they are participant runs into "recalcitrant experience" and such an adjustment promises to smooth out the wrinkles.

Thesis: neither claim can be sustained in full generality.

Some Familiar Initial misgivings about these claims

---

[1] Quine (1951)

(i) (Phenomenology) Basic logical laws/inferential transitions tend to impress us as both *immediately* obvious and as necessary. Even the most entrenched of physical laws does not.

(ii) (Modality) Logic is good for reasoning about an *arbitrary counterfactual scenario*, including ones where optimal physical law fails.

(iii) (Scope) Frege thought of truths of logic as Laws of Thought— their validity knows no bounds: that if a logical principle is good at all, it is good for any thinkable domain. By contrast, ceteris paribus clauses seem to be part and parcel of our ordinary conception of physical law.

However these points are open to the rejoinder that they merely issue from a conception of the status of logic that is exactly what anti-exceptionalism questions and intends to supplant.

On Corroboration

Is a Quinean account of the epistemology of basic (propositional) logical knowledge so much as coherent?

Quine's idea: in any situation of potential confirmation or disconfirmation of an empirical hypothesis, a holism is activated to the effect that not only that hypothesis but all other ingredients in play, including statements of the evidence, statements of initial conditions, predictions elicited from the hypothesis on the assumption of the initial conditions, *and the underlying logic* that mediates those predictions, are likewise in the firing line.

To think this through:
Let ϑ be a theory that is to be tested against experience and let L be its underlying logic. Testing ϑ will involve the derivation from it in L of conditional predictions telling us what observations we should expect relative to certain specified initial conditions.
Let I→O be a particular such conditional prediction. A body of evidence, E, will then count as confirmatory if it provides, or appears to provide grounds for accepting both I and O but *recalcitrant* if it provides, or appears to provide, grounds for accepting I but rejecting O. But recall that according to the standpoint of Quine's holistic empiricism, *every* element contributing to such a verdict of overall recalcitrance is potentially open to rational revision. The potential suspects therefore include not only

(i) the theory, ϑ, itself;

(ii) the logic L that mediates the derivation of the testing conditional, I—>O;

(iii) the claim that E does indeed corroborate both I and not-O and

(iv) the *bona fides* of the evidence E,

but also

(v) the claim that the relevant testing conditional is indeed an L-consequence of ϑ.

Should there be any doubt about potential suspect (v), then we do not yet have a situation where any modification of the theory, or of its underlying logic, or of any of the other components in the situation is called for.

What's the Anti-exceptionalist account of our knowledge of /entitlement to (v)??
It cannot be as a by-product of entrenchment in successful empirical theory

Upshot: The process of empirical theory refinement and improvement must, on the Quinean model, commit the theorist to judgements about logical consequences whose epistemic good standing is presupposed if the process itself is to be in epistemic good standing but which cannot in general yet have acquired the only kind of epistemic good standing that anti-exceptionalism recognises: viz. entrenchment in successful empirical theory.

On *Revision — the R-pickle*

Quine habitually conceives of logic as a *body of doctrine*. But the underlying logic of a theory may exist only in the form of a syndrome of inferential practices So before we can hold logic accountable to empirical evidence, we will need to make these explicit, to represent their characteristic patterns in the form of a body of (schematic) statements. Let L be such an explicit underlying logic for an empirical theory T.

However if L+T it is to be subjected to empirical testing, we will need to apply an underlying logic to *it*. What is to be the system of inference, L*, in which the testing of L+T is to be thus conducted?

Ideally, L* will be disjoint from L, and independently highly credible. But this ideal looks unrealistic. If L is, e.g., a propositional and quantificational logic of any normal degree of strength, L* will surely significantly overlap with it. *How can we test the (putative) empirical credentials of a logic by using what is essentially the same or a substantially coincident logic*?

This way be Dragons!

Suppose we deduce a contradiction between elements of T+L and observational data, O, and are tending to the view that it is not T, but L that is to blame— specifically, that the rogue may be one of L's basic principles, R. In order for this suspicion to be a rational option, *we have to remain confident that the original derivation of the contradiction is good*, that is, that we really have shown that T+L conflicts with the observational data. So we had better have no qualms about the good standing of the L*-principles essentially involved in that derivation. What if a counterpart of R *itself* is so involved?

Casually regarded, the situation might seem merely to be a form of *reductio* of R. But that reaction is not dialectically stable. Rather, if R is indeed essentially involved, not as a premise, but as a rule of inference in the reasoning whereby we obtain the contradiction, treating the situation as a reductio of R plunges us into a state of aporia. For in order rationally to justify a proposal to revise R on the basis of the contradiction, we need to repose trust in the consequence relation for L* — to trust that L*-consequences *really are* consequences; and in order to trust in that, we need to trust that conclusions licensed by R, as one of the L*-principles involved, *genuinely follow*. So we wind up both distrusting R — our proposed Quinean conclusion — and committed to trusting it — otherwise we cannot justify the distrust. R becomes, as it were, an unreliable witness to its own unreliability.

The key thought is that the belief that *you really have a Problem*, which rationality requires you to remedy, must rely on the belief that your derivation is sound, so on a belief that R is good. If you then query that, you undermine your reason for thinking that you have a Problem in the first place.

The illustrated pickle —the 'R-pickle'—won't arise if the L*-principles involved in the original derivation happen not to include any counterpart of R. How to ensure they don't? Axiomatise L and use the sparest possible L*.

E.G. for Vel-Elim:

$$((P\&R \longrightarrow T) \, \& \, (Q\&S \longrightarrow T)) \longrightarrow (((P\lor Q) \, \& \, (R\&S)) \longrightarrow T),$$

whose application in proofs would then be left to rules of admissible substitution for the sentential letters involved, and, of course, to *modus ponens*. So to avoid the R-pickle in any particular case, we can axiomatise R, add it to T+L, and fall back on an underlying logic containing just substitution rules and *MPP*. However, you can't do this for UI and MPP.

Conclusion: *some versions* of modus ponens and universal instantiation respectively must indeed be treated as exceptional within any coherent management of sufficiently rich systems of empirical belief. The overall patterns of reasoning licensed by these principles cannot be regarded as challenged outright and in full generality by experience except at the cost of the cognitive incoherence of the R-pickle.