- In a 2004 manuscript, John MacFarlane [9] investigates various *bridge principles* linking logic and epistemology.
- Specifically, he investigates principles of the general form:

(BP) If $\Gamma \vDash p$ (*i.e.*, if the argument from Γ to p is *valid*), then (normative claim about believing (members of) Γ and/or p).

- MacFarlane's idea was to (a) try to articulate plausible instances of (BP), and then (b) *use* these (BP)'s to get traction on various (vexed) debates about the nature of validity.
- If this could be made to work, then (or so one of the central hopes was) perhaps it could generate reasons for logicians (of some stripes) to *revise* their logical principles.
- Today, I will try to articulate a dilemma for the application of MacFarlane-style (BP)'s in the service of trying to provide *classical* logicians with reasons to revise their logical beliefs.
- I will also explain why Goodman's [6] argument against (Carnapian) *inductive* logic faces a similar dilemma.

- I will, for the sake of today's arguments, grant that logic is "normative for thought" in at least the following sense:

(NL) If S believes that p and (then) S becomes convinced that there is a *sound* argument *against* p, then this puts pressure on S to revise their belief that p.

- I will take (NL) as common ground between the classical and non-classical logician. Moreover, I will assume that (NL) can be applied to both logical and non-logical p's.
- The disagreement about deductive logic (Vignette #1) I'll discuss today will have to do with the nature of *validity*.
- I will be talking about an agent (Gil) who accepts (NL), and who understands "validity" as "necessary truth preservation" (*viz.*, classical deductive validity/entailment).
- Our non-classical (specifically, relevant/para-consistent) logician (Bob) will be trying to convince Gil that there a sound argument against "explosion" (the classical rule).

- In the second Vignette, I will discuss an analogous dialectic that arises between a classical inductive logician (Rudolf) and a non-classical inductive logician (Nelson).
- Nelson's goal is like Bob's. He will try to convince Rudolf that there is a sound argument against a fundamental tenet of Rudolf's favorite variety of classical inductive logic.
- In both cases, the non-classical logician aims to produce an argument that: (a) the classical logician should accept as sound, and (b) refutes a (central) classical logical principle.
- While the arguments I initially present will seem like straw men, I will argue/suggest/conjecture that there is no way to fix them so that they will satisfy both desiderata (a) and (b).
- Specifically, my conjecture/challenge will be that any argument (along the general epistemological lines pursued by Bob and Nelson) will involve a *bridge principle* linking logic & epistemology that is either *implausible* or *too weak*.

- Bob offers Gil the following *classical reductio* of "explosion":

1. If a set of propositions Γ is classically deductively inconsistent, then, *for every* p, $\ulcorner \Gamma \therefore p \urcorner$ is a *valid* argument.
   - This is "explosion", and it is being *supposed for reductio*.
2. Let $\mathcal{B}_S$ be S's belief set. *For every* p, if S knows that $\ulcorner \mathcal{B}_S \therefore p \urcorner$ is valid, then it is epistemically permissible for S to believe that p (*i.e.*, for S to *come to believe* that p).[1]
   - This is a *bridge principle* linking logic and epistemology.
3. If S knows that their belief set $\mathcal{B}_S$ is classically deductively inconsistent ($\therefore \mathcal{B}_S$ entails *any* p), then it is epistemically permissible for S to believe *any* proposition p.
   - This follows from premises (1) and (2).
4. *Even if* S knows their $\mathcal{B}_S$ is classically inconsistent, there are still *some* propositions that S should *not* believe (*i.e.*, some p's that are *epistemically impermissible* for S to believe).
   - This is an uncontroversial epistemic principle (next slide).

- Contradiction. And, *reductio* of (1) complete. Or is it …

[1] This bridge principle falls under MacFarlane's Cp+k category.

- Gil agrees that this argument is a *valid reductio*.
- The question is whether Gil should see this as a *sound* argument against "explosion". [Answer: *he shouldn't*.]
- Gil believes that (4) is true, as he should.
  - After all, if S knows that p is false, then it is not epistemically permissible for S to believe that p. So, provided only that S has *some* knowledge, (4) must be true.
- Gil believes that (3) is false, as he should.
  - Gil believes that *if* (4) is true, *then* (3) is false. As such, Gil (reasonably) infers (*via modus ponens*) that (3) is false.
- So, since Gil knows that (3) follows from premises (1) and (2), Gil will/should see this argument as a sound argument against "explosion" just in case Gil believes that (2) is true.
- But, Gil believes that (2) is *false* (for epistemic reasons that are *independent* of "explosion"). So, he does *not* (and *should not*) see this as a sound argument against "explosion".

- At this point, you're likely to have the following reaction.
- This argument you're attributing to Bob is a *straw man*. Surely, there is a better *reductio* of "explosion" out there.
- I don't think so (at least, not along "epistemic lines").
- Bob's (Cp+k) bridge principle (2) is *independently implausible* (see [9, *p.* 9]). Maybe he just needs a better (BP)?
- I conjecture Bob will *inevitably* face the following *dilemma*.

(†) *Any* bridge principle (2)/(2′) will be *EITHER*

(a) *implausible* [and for reasons *independent* of "explosion"],

OR

(b) *too weak* for a *classically valid reductio* [with (1) + (4)/(4′)].

- All the bridge principles in MacFarlane's survey [9] seem to satisfy (†). And, I suspect that (†) is relevant to MacFarlane's abandonment of his "logical adjudication" project in [9].
- Also, I think (†) is at the heart of Harman's skepticism in [7].

- More generally, the challenge I am offering to Bob is the following. I'm looking for an argument like this.

1. Classical logical principle $\mathscr{L}$.
   - Note: $\mathscr{L}$ is being *supposed for reductio*.
2. Bridge principle connecting logic and epistemology.
   - Note: this bridge principle should be (a) *not independently implausible* (independently of worries about $\mathscr{L}$), *and* (b) *strong enough* to render this *reductio classically valid*.
3. Epistemic consequence of (1) and (2) that *contradicts* (4).
   - Note: Gil should be able to (classically, competently) deduce this epistemic consequence (3) from (1) and (2).
4. Independently plausible epistemological assumption.
   - Note: this should be an (independently plausible) epistemological assumption that (classically) *contradicts* (3).

- My worry (†) is that (*generally*) there will be no way to formulate (2) and (4) so as to yield an argument that Gil should see as a sound argument against principle $\mathscr{L}$.

- Once upon a time, there were advocates of inductive logic.
- Hempel [8] defended a theory of the confirmation relation, which was meant to be an inductive-logical relation.
- Hempel's theory is implausible (for various reasons — some of which I think *he* would have conceded [4]), so I won't discuss "reductios" of Hempelian confirmation theory.
- Rather, I will take Carnap (Rudolf) to be our proponent of classical inductive logic [1].
- For Rudolf, confirmation is a three-place relation between evidence E, hypothesis H, and background corpus K.

($\star$) E confirms H, relative to K iff $\Pr(H \mid E \,\&\, K) > \Pr(H \mid K)$, where $\Pr(\cdot \mid \cdot)$ is an "inductive-logical" probability function.

- Nelson's "grue"-*reductio* [6] of ($\star$) will *not* depend on which probability functions are counted as "inductive-logical".
- I explain Nelson's *reductio* in detail elsewhere [3]. Here, I'll present a condensed rendition of Nelson's "grue" argument.

- Let $Gx \overset{\text{def}}{=} x$ is green, $Ox \overset{\text{def}}{=} x$ is observed (for the first time) prior to t, and $Ex \overset{\text{def}}{=} x$ is an emerald. And, define "grue" as:

$$\mathcal{G}x \overset{\text{def}}{=} x \text{ is grue} \overset{\text{def}}{=} Ox \equiv Gx.$$

- Consider the following two universal generalizations
  - (H_1) All emeralds are green. $[(\forall x)(Ex \supset Gx)]$
  - (H_2) All emeralds are grue. $[(\forall x)[Ex \supset (Ox \equiv Gx)]]$
- And, consider the following instantial evidential proposition
  - ($\mathcal{E}$) $Ea \,\&\, Oa \,\&\, Ga$
- Now, suppose S is in a "grue context" $C_{\mathcal{G}}$ such that S *already knows that* Oa (since t is far in the future).
- Finally, consider the following "bridge principle" linking logic (confirmation) and epistemology (evidential support):
  - (RTE) E evidentially supports H *for* S *in* C iff E confirms H, relative to K, where K is S's *total evidence in* C.
- Now we're ready to examine Nelson's *reductio* of ($\star$).

- Nelson offers Rudolf the following *classical reductio* of ($\star$).
  1. E confirms H, relative to K iff $\Pr(H \mid E \,\&\, K) > \Pr(H \mid K)$.
     - This is ($\star$), and it is being supposed for *reductio*.
  2. E evidentially supports H *for* S *in* C iff E confirms H, relative to K, where K is S's *total evidence in* C.
     - This is the B.P. [(RTE)] linking logic and epistemology.
  3. The agent S who is assessing the evidential support $\mathcal{E}$ provides for H_1 *vs* H_2 in $C_{\mathcal{G}}$ *already knows that* Oa, and so Oa is part of S's total evidence in $C_{\mathcal{G}}$ [*i.e.*, $K \vDash Oa$].
     - This is part of the set-up of the "grue" context $C_{\mathcal{G}}$ [2].
  4. *If* $K \vDash Oa$, *then—c.p.—*$\mathcal{E}$ confirms H_1 relative to K iff $\mathcal{E}$ confirms H_2 relative to K, for ***any*** function $\Pr(\cdot \mid \cdot)$.
  5. Therefore, $\mathcal{E}$ evidentially supports H_1 for S in $C_{\mathcal{G}}$ if and only if $\mathcal{E}$ evidentially supports H_2 for S in $C_{\mathcal{G}}$.
  6. $\mathcal{E}$ evidentially supports H_1 for S in $C_{\mathcal{G}}$, but $\mathcal{E}$ does *not* evidentially support H_2 for S in $C_{\mathcal{G}}$.
- Contradiction. And, reductio of ($\star$) complete. Or is it …

- (6) is Nelson's intuition about the evidential relations in $C_{\mathcal{G}}$. One could question this, but I'll suppose Rudolf accepts it.
- (5) follows from (1)–(4). So, we can proceed to (4).
- (4) is (*ceteris paribus*) a theorem of probability calculus.
  - The *c.p.* clause needed is $\Pr(Ea \mid H_1 \,\&\, K) = \Pr(Ea \mid H_2 \,\&\, K)$, which is typically assumed (and Rudolf accepts it for $C_{\mathcal{G}}$).
- (3) is a kosher stipulation in Nelson's setup (*pace* [2]).
- (2) is the bridge principle linking inductive logic (confirmation) and epistemology (evidential support).
- Rudolf will/should see this as a *sound reductio* of ($\star$) just in case he will/should believe that (2) is true.
- But, Rudolf should *not* believe that (2) is true.
  - There are *independent reasons to reject* (2). Most notably, Glymour's *old evidence problem* [5].
- Conjecture: (‡) *any* B.P. will be implausible *and/or* too weak.

[1] R. Carnap, 1962, *Logical Foundations of Probability*, second edition.

[2] D. Davidson, 1966, "Emeroses by Other Names," *Journal of Philosophy*, 63(24): 778–780.

[3] B. Fitelson, 2008, "Goodman's 'New Riddle'," *Journal of Philosophical Logic*, 37(6): 613–643.

[4] B. Fitelson and J. Hawthorne, 2010, "The Wason Task(s) and the Paradox of Confirmation," *Philosophical Perspectives*, 24(1): 207–241.

[5] C. Glymour, 1980, *Theory and Evidence*, Princeton University Press.

[6] N. Goodman, 1955, *Fact, Fiction and Forecast*, Harvard University Press.

[7] G. Harman, 1986, *Change in view: Principles of reasoning*, MIT Press.

[8] C. Hempel, 1945, "Studies in the Logic of Confirmation" (I & II), *Mind*, 54(213): 1-26 & 97-121.

[9] J. MacFarlane, 2004, "In What Sense (If Any) Is Logic Normative for Thought?," unpublished manuscript.