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## ***DEFLATING UNDERDETERMINATION: LAUDAN'S CRITICISMS***

- **Recall ( Lecture XXI )** Donald Gillies' presentation of Duhem's thesis of **methodological holism** combined with Quine's thesis of **semantic holism** (i.e. anti-reductionism<sup>1</sup>) to evince the **Duhem-Quine Thesis (DQT)** which appears to present a particularly strong case for **theory under-determination**.<sup>2</sup> Adopting Laudan here I'll abbreviate the latter as **UD**.
- To wit, Gillies sought to qualify aspects of both Quine and Duhem by mutually tempering each other for maximum effect supporting **UD**. Gillies' formulation of **DQT** briefly stated (from Lecture XXI 's paraphrase, p. 4) is:

[Gillies] qualif[ies] Quine's [semantic] holism with...Duhem's [epistemological/methodological] *bon sense* (part **B**, CC1998, p.317) while at the same time acknowledging Quine's epistemic holism as applicable to 'high level' theoretical entities in any science. (part **A**, 317)

Gillies in other words believes that his formulation of **DQT** (part **B**) tempers what may prove objectionable (or at least somewhat flat-footed) concerning Quine's claim that "a unit of empirical significance **is the whole of science**"<sup>3</sup> (314) and what that entails for Quine, namely that "Any statement can be held to be true come what may, if we make drastic enough adjustments elsewhere in the **system** [i.e. the 'web of beliefs', the radically underdetermined 'field' constrained by the boundary conditions of our experience]."<sup>4</sup> (317) Counters Gillies:

The group of hypotheses under test in any given situation is **in practice limited, and does not extend to the whole of human knowledge**...scientific good sense [*bon sense*] concludes in many situations that it would be **perfectly unreasonable** to hold on to [certain] particular statements [regardless if warranted by logic]. (317)

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<sup>1</sup> See p 1, Lecture XXI, as well as footnote 11, Lecture XXSupplement

<sup>2</sup> I.e. that theories are always undetermined by their evidence. No matter how much evidence *E* is presented, **there are no methodological criteria to uniquely select some unique theory *T*, based on any logical or epistemological structure shared by *E* and *T* (as well as *T*'s alternatives *T'*, *T''*, *T'''*,...)alone**. Recall the last discussion question in Lecture XXI, that Aichinstein's notion of "**empirical incompleteness**" seems like a typical instance of such an underdetermination, as implied by the Duhem-Quine Thesis in general. At least one of your fellow classmates (Ricky O'Steen) agreed with this *prima facie* claim.

<sup>3</sup> From 'Two Dogmas of Empiricism' (1951) p. 42.

<sup>4</sup> Quine (1951) 43. Recall (Lecture XXI) from Quine's paper:

The totality of our so-called knowledge or beliefs...is a man-made fabric which impinges on experience only at the edges...**total science is like a field of force whose boundary conditions are experience...the total field is so underdetermined by ...experience, that there is much latitude of choice as to what statements to reevalutae in the light of any single contrary experience.** (296)

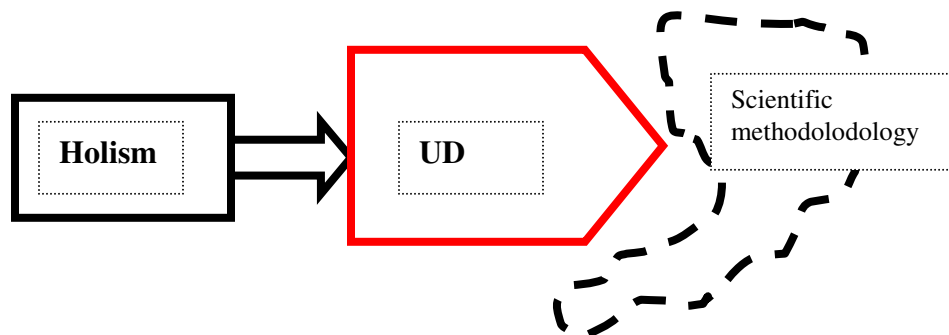
At the same time, however, (DQT, part A) Gillies grants Quine’s “holistic thesis applies to any high-level...theoretical hypotheses, whether of physics or of other sciences, or even of mathematics and logic.”<sup>5</sup> (317)

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**LAUDAN’S RESPONSE (“Deystifying Underdetermination” (1975))**

In a nutshell, it appears that in Laudan’s long and nuanced response, **he is blocking a normative inference of UD** from what may be **just a descriptive account of holism** (both **semantic** and **methodological**). He argues that **scientific methodology** does a good enough job to **deflate UD**, regarding any seriously normative ramifications UD may pose against scientific methodology.

He argues that the bill of goods writers swayed by or championing UD (Quine, Kuhn, Bloor, Hesse<sup>6</sup>, etc.) implies the false picture: (their bad normative inferences to UD appears to falsely present a deflationary picture of scientific methodology.)

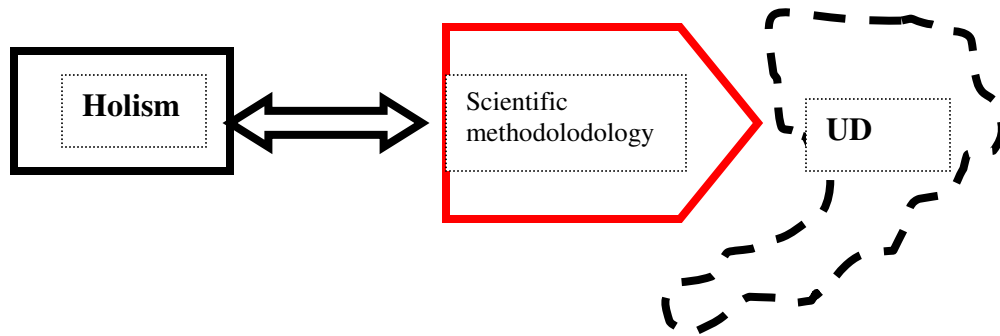


Laudan wants to restore what he considers is this outrageous and unwarranted assault. His picture is just the reverse:

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<sup>5</sup> The evidential basis for such a claim Gillies cites from the development of non-Euclidean geometry (which *pace* Duhem’s ‘common sense’ objections thereof) serves as an instance of *bon sense*! Recall also **Lecture II**, recent developments of non FOPL logic, as well as the example Quine himself cites, concerning how the “logic of the microworld” (“quantum logic”) violates a core belief concerning the Law of the Excluded Middle.

<sup>6</sup> David Bloor and Mary Hesse were leading writers of the ‘socialized epistemology’ movement. His (1975) attacks against Hesse and Bloor may strike you as somewhat dated, as you recall in some of your readings of Longino (1990) and Kitcher (2000) who offer, in their own ways, far more nuanced claims sympathetic to social epistemology. In other words, the field has clearly evolved since the 1970s (doubtless thanks to criticisms like Laudan’s).



Sloppy formulations of the thesis of underdetermination have encouraged authors to use it—sometimes inadvertently, sometimes willfully—to support relativist conclusions they fancy. Moreover, a **failure to distinguish several distinct species of underdetermination**—some probably viable, others decidedly not—**has encouraged writers to lump together situations that out to be sharply distinguished...**[normative] inferences have been drawn from [descriptive] fact[s] of underdetermination that by no means follow from it. (-CC1998,321)

- Recall **Lecture XVII** in the discussion of Clark Glymour’s (1980) criticism of Bayesianism.<sup>7</sup> Just as Glymour argued that the Bayesian (at best) provides *some* evidence for the effectiveness of their algorithm in *some* cases of theory choice, *this obviously constitutes no basis for a general argument!*<sup>8</sup> **Laudan adopts a similarly deflationary strategy here as well: just becomes *some* aspect(s) of UD are confirmed in *some* interesting cases, *this obviously constitutes no basis for a general argument!***

(a) We can show that for **some** rules, and for **certain** theory pairs, theory choice is underdetermined for **certain sorts of evidence...**(b) We can show that for **some** rules and for **some local situations**, theory choice is underdetermined, regardless of the sorts of evidence available...What is the significance of such limited forms of ampliative<sup>9</sup> underdetermination as these? **They represent interesting cases to be sure, but none of them—taken either singly or in combination—establishes the soundness of strong ampliative underdetermination as a general doctrine.** (340)

- Laudan’s tactics involve a careful taxonomy of the many senses of **UD** (i.e. some of what he considers are legitimate versus those he considers aren’t, as mentioned

<sup>7</sup> “Why I am not a Bayesian”

<sup>8</sup> Clark Glymour (**Lecture XVII**, p. 4)

“[P]articlar *inferences* can almost always be brought into accord with the Bayesian scheme by assigning degrees of belief more or less ad hoc, *but we learn nothing from this agreement. What we want is an explanation of scientific argument; what the Bayesians give us is a theory of learning, indeed a theory of personal learning. But arguments are more or less impersonal...*To ascribe to me degrees of belief that make my slide to my premises to my conclusion a plausible one fails to explain anything not only because the ascription may be arbitrary, but also because, even if it is a correct assignment of my degrees of belief, **it does not explain why what I am doing is arguing--...that is, what I say should have the least influence on others, or why I might hope that it should.** (592, some italics added)

<sup>9</sup> I.e., inferences that aren’t **deductive**. Ampliative inferences include inductive and abductive inference, for instance.

above.) This hashing of **UD** coupled with his bashing of Quine comprises the bulk of his article:

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**HUD:** (Humean UD). Recall the **Problem of Induction**.<sup>10</sup> Formulated most starkly by Hume it of course states that one can never infer (by any rule of *deductive* inference) a general statement from a list of particular premises.<sup>11</sup> So stated this obviously presents itself as UD thesis, *of a very weak and uninteresting variety*:

[HUD states that] [f]or any body of evidence, **there are indefinitely many mutually contradictory theories, each of which [deductively] logically entails that evidence.** (323)

Recall (**Lectures XIX, XX**) for example the ‘deductive chauvinism’ of explanatory unification (described in your Kitcher articles) as well as the DN model (Hempel) of explanation. As theories/laws aim toward **generality**, and can be formulated as ‘conclusions’ according to the H-D schema from particular evidence claims, according to HUD above such one can never deduce a unique conclusion ( a unique theory *T*) and conversely more than one *explanans* can account for the explanandum<sup>12</sup> Laudan mentions viz. the problem of induction and HUD (as well as other UD versions, since Goodman’s ‘new riddle’ touches on these other versions) Goodman’s “grue” problem (recall **Lecture XV**) as well as Goodman’s solution-strategy<sup>13</sup> and its shortcomings:

There is something monumentally question-begging going on in Goodman’s...examples. He supposes without argument that—since the contrary inductive extrapolation all have the same positive instances (to date) [i.e., before 2050, each instant of an emerald is green] **the inductive logician must assume that the extrapolations from each of these hypotheses** [i.e.  $H_1$  : ‘All emeralds are green,’  $H_2$  : ‘All emeralds are grue’] **are all rendered equally likely by those instances.** Yet we have already had occasion to remark that ‘possessing the same positive instances’ and ‘being equally well confirmed’ boil down to the same thing only in the logicians never-never land.<sup>14</sup>

Moreover:

[T]here is nothing whatever in Goodman’s analysis—even if we grant *all* its controversial premises—that could possibly sustain and egalitarian conclusion

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<sup>10</sup> As discussed in **Lecture II** and elsewhere. Of course, those of you who wrote on Topic 1 of the of the first paper know well how inductive logicians sought to contain or ‘solve’ this problem.

<sup>11</sup> Stated more formally, the domain of information the conclusion refers to can never exceed the union of the domains of information referred to by the premises in a deductive argument.

<sup>12</sup> Of course, as we have reviewed previously, Hempel and Carnap and others have developed research programs to cope with HUD, hence an instance of its uninteresting character.

<sup>13</sup> Banishing warped predicates, etc.

<sup>14</sup> Recall **Lecture II**: a simpler version of this point Laudan is making is the unwarranted assumption latent in Pascal’s Wager: that disjunct logical outcomes are equally likely. I.e. it’s wrong to say that just because ‘God exists/God doesn’t exist’ are logical disjuncts, they’re equally likely outcomes.

[i.e. that **any** hypothesis  $H$  is just as good as another if it confirms the same evidence  $E$ ]. **Goodman's argument, after all, does not even claim to show apropos of the straight rule that it will provide support for any and every hypothesis...it becomes clear that no global conclusions whatever can be drawn from Goodman's analysis...** (337-338)

As mentioned above, since Goodman's new riddle of induction involves more than just the HUD, we'll revisit these issues subsequently and understand better why Laudan argues against Goodman as he does.

In any case, concerning the HUD:

HUD [is] extraordinarily weak.. [since] **it addresses itself only to the role of deductive logic in scientific inference...**it is wholly silent about whether the rules of a broader ampliative logic underdetermine theory choice. Secondly, **HUD provides no motivation for the claim that all theories are reconcilable within any given body of evidence;** it asserts rather that *indefinitely* many theories are so...**even if our doxastic [belief-oriented] policies were so lax that they permitted us to accept as rational any belief that logically entailed the evidence, HUD would not sanction the ["egalitarian"]...claim that all rival theories are thereby equally belief-worthy or equally rational to accept.** (323)

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### **QUD (Quinean Underdetermination)**

Laudan spends the bulk of his essay attacking Quine (324-336). Aside from pointing out in many endnotes where he believes Quine subsequently waffled and backed off from some of notions his meaning-holism entailed for scientific methodology (n39, n19, n35) Laudan writes:

*Quine is no longer arguing that any theory can be reconciled with any evidence,* he is maintaining rather that, no matter what our evidence and no matter what our rules of appraisal, there will always remain the possibility (or the likelihood) that the choice will not be uniquely determined. (334)

Even on this more modest latter point, according to Laudan, Quine gets himself into trouble.

According to Laudan the gist of QUD can be stated as:

Any theory can be reconciled with any recalcitrant evidence by making suitable adjustments in our other assumptions about nature. (328)

Which can be cashed out in the following versions:

(0) One **may** hold onto any theory whatever in the face of any evidence whatever. (325)

- (1) It is **rational to** hold onto any theory whatever in the face of any evidence whatever. (325)
- (2) Any theory can be **rationally retained** in the face of any recalcitrant evidence. (330)
- (2\*) Any theory can be shown to be as well supported by any evidence as any of its known rivals. (331)

Note the regression here! These mark stages on the way of Laudan's deflation of SUD. According to Laudan, Quine **never offers an argument** (n27) for SUD viz. a constructive confirmation methodology, so Laudan's counterargument deflates Quine's.

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### **Other characterizations of UD:**

Descriptive and normative senses can be distinguished from (1), (2), (2\*), "depending upon whether one is making a claim about people are doing or what the rules of scientific rationality allow." (334) Moreover, deductive (HUD) versus ampliative (SUD) versions should be distinguished according to the following ways *E* can relate to *T*: a) *T* can be **logically compatible** with *E*, b) *T* can **logically entail** *E*, c) *T* can **explain** *E*, d) *T* can be **empirically supported** by *E*. (329)

It is precisely the normative versus descriptive confusion he accuses the social epistemologists as well as Kuhn's historical approach. He mentions for instance that Hesse commits a fallacy of dichotomization by labeling 'social factors' everything needing to fill in the UD 'gaps' (343). Bloor's point seem even more dubious (an all or nothing fallacy):

"[Bloor] claims that because certain types of evidence are neither necessary nor sufficient to occasion changes of belief, it follows that no evidence can ever compel a rational scientist to change his beliefs. This is exactly akin to saying that, because surgery is not always necessary to cure gall stones, nor always sufficient to cure them, it follows that surgery is never the appropriate treatment. (345)

His passages against Kuhn may seem virtually *ad hominem*, but keep in mind from your readings of Laudan his goal was to explain *progress* (viz research traditions). Laudan found Kuhn's notion of no extra-paradigmatic factors for evolution aside from contextual (though Kuhn of course deemed them as rational, though not logically regimented or rule based) unacceptable. (See 345)