Historical Inductions Meet the Material Theory

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Overview

Thesis: "Historical inductions, that is, the pessimistic metainduction and the problem of unconceived alternatives, are critically analyzed via John D. Norton's material theory of induction and subsequently rejected as noncogent arguments" (918).

Sections:

2. The (Inductive) Pessimistic Metainduction

Inductive Generalization PMI:

> P(i) Past theory 1 was successful but not genuinely referential or approximately true.
>
> P(ii) Past theory 2 was successful but not genuinely referential or approximately true.
>
> ...
>
> (C) Therefore, current (and perhaps future) theories are successful but (by induction) probably not genuinely referential or approximately true. - p. 919

While some criticize PMI on the grounds that its data is biased or cherry-picked, Shech wants to point to a more fundamental worry; that there is no uniformity licensing the inference from P(i)-P(n) to (C).

3. PMI Meets the Material Theory

The Material Theory of Induction

Question: Why is

"(P1) Some samples of the element bismuth melt at 271°C.

(C1) Therefore, all samples of the element bismuth melt at 271°C."

different from

"(P2) Some samples of wax melt at 917°C.

(C2) Therefore, all samples of wax melt at 917°C."

?

Answer (Norton): The admissibility of P1 to C1 is due to a *material postulate* (local fact) — i.e. the uniformity of chemical elements in their physical properties — not due to the inference fitting into some universal inductive schema. Likewise, all inductions are warranted in virtue of material postulates.

Material Analysis of PMI

Like the inference from some wax samples to all wax samples, the inference from some scientific theories to all scientific theories in the PMI is not licensed by any material postulate. There is no uniformity between scientific theories which could serve as a licence to make the inductive inference.

Candidate material postulate: The Scientific Method

Shech: 'the scientific method' is really "an umbrella term for very different methods used by scientists to construct and discover theories" (p. 921). Furthermore, scientific theories are too heterogeneous to warrant such an induction.

Candidate material postulate: Traits of Scientists

Shech: Scientists are also too heterogeneous to licence generalization.

Candidate material postulate: Theories are uniform with respect to what explains their predictive success (something besides truth)

Shech: Realists would argue that their truth best explains their success. Furthermore, establishing this material postulate would require an inductive inference, which would either circularly appeal to the PMI or beg the question.

Discussion Questions

1. Do we buy Shech's reasons for rejecting these material postulates?

2. Are there any the candidate material postulates that Shech has not considered?

4. Extension to the Problem of Unconceived Alternatives

The Problem of Unconceived Alternatives (Stanford): The history of science is filled with eliminative inferences done on the set of conceived hypotheses, only later to find out the "true" hypothesis was not in that set.

Candidate material postulate: Scientific method or traits of scientists

Shech: Rejected for same reasons above

Candidate material postulate: Cognitive Limitations of Scientists

Shech: Cognitive limitations do not ensure that there are unconceived alternatives consistent with available evidence (which is a matter of logic). If we assume that there always are unconceived alternatives based on modal considerations, then the argument is no longer inductive.

Commentary: I found this to be the weakest part of the paper. I do not understand why modal considerations cannot be used as a material postulate in a historical induction. Aren't modal statements always used as material postulates?

5. Room for a Local, Material Pessimistic Induction?

Although global PMI are untenable, there is still the possibility of local PMIs.

Example: Recent studies in medicine of a certain type - studies that use contemporary methods and are the first to investigate an issue - are unreliable.

Candidate material postulate: Similar methodological flaws in the studies (bias, non-randomized trials, small sample sizes, etc.) could explain their unreliability.

Moral: It seems plausible that PMIs can be used locally, but not globally.

Gems

Clear exposition of PMI and material theory of induction

Well Structured

Argumentation moves too fast in places

Discussion Questions

1. Can't we just reject the material theory of induction?

2. Do we agree with the possibility of local PMIs?

3. How are history and philosophy of science being integrated in the paper?