A Note on Straight-Thinking

A supplementary note for the 2nd Annual
JTS/CGST Public Ethics Lecture

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Arguments & Appeals

✓ In arguments, people try to persuade one another to accept views that they may be inclined to reject.

✓ In so doing, they will appeal to at least one of three major means of persuasion:

- **Emotions**
- **Authority**
- **Facts and Reasoning**

Emotions

✓ Our emotions may be based on an accurate perception: e.g. If we jump out of the way when we see a car rushing towards us.

✓ Equally, when there is a truth or justice issue at stake, passions tend to run high; this must be expected and respected.

✓ However, emotions often blind us to what is true, right, just or fair. So, we need to always ask whether our emotions rest on truth and right.

Authority

✔ As C. S. Lewis pointed out, we depend on authorities for at least 99% of practical argument -- starting with the Dictionary.

✔ Even in Science, we are counting on qualified people to present a true and fair view of the facts and their implications in light of reasonable hypotheses.

✔ However, no authority is better than his/her facts and reasoning. So, we need to authenticate authorities and test ("audit") their specific claims.

Facts & Reasoning

✓ This is the only appeal that actually establishes its claims.

✓ However, we must assess whether claimed facts are so, and whether they are representative of the truth.

✓ Next, we need to see if the logic is valid. (This requires a knowledge of *the logic of deduction*. E.g. Socrates is a man; all men are mortal; so, Socrates is mortal.)

✓ In the case of *Inductive arguments*, we need to look at whether the inferences are well supported by the evidence. (E.g. the Sun has risen many a time day by day, most regularly; so, we may confidently expect it to rise on the morrow.)

Ironies of deduction & induction

✓ Now, a valid deductive argument can only make explicit in the conclusion what was already "there" in its premises. (Men, obviously, are mortal.)

✓ So, *deduction is incapable of <u>true</u> discovery of novel truth.* (We need induction for that; especially in science.)

✓ But *induction <u>cannot</u> give 100% certainty of truth*. (E.g. the sun just might not rise tomorrow, and the "inductive turkey" showing up for lunch "as usual" on Xmas Eve may just find itself *becoming* the lunch for the morrow!)

✓ However, deduction helps us bring out and clarify what we believe to be true means. (And if the implications *reduce to absurdity*, it helps us spot falsities or confusions in our beliefs. So, it helps us spot & correct mistaken beliefs.)

Scientific Reasoning/Methods

✔ Here, we systematise inductive reasoning, using **"O, HI PET":**

O -- OBSERVE apparent facts & patterns in nature

H -- HYPOTHESISE: what are the explaining "laws"? (Here, we try to get at cause-effect links, models and theories that describe & explain patterns in the world.)

I & P -- INFER & PREDICT: Based on the suggested "laws," what will happen in other situations?
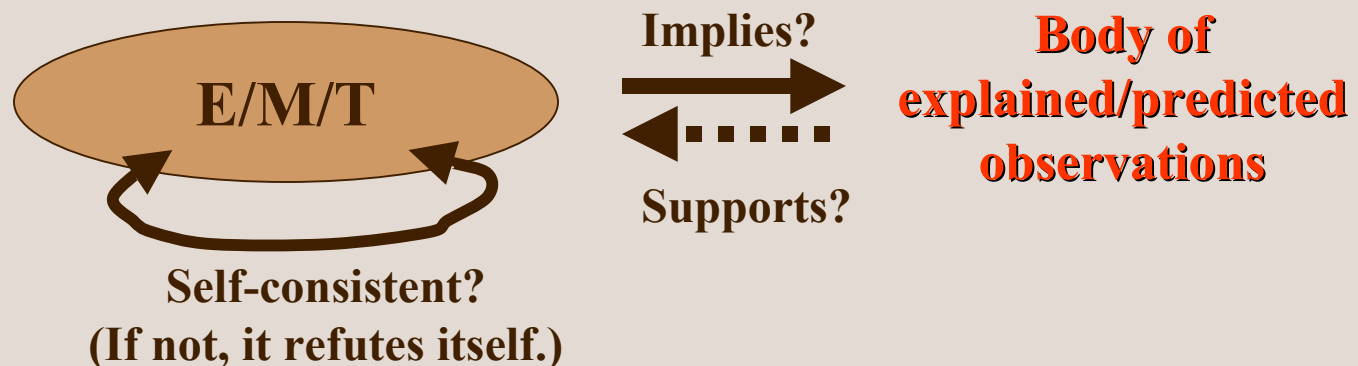
ET -- EMPIRICALLY TEST: We try to validate through experiments or observational studies, to see if we can reasonably trust the predictions. *(We must always be open to correction: Science is provisional.)*

Science is Provisional?

✓ **Scientific arguments, following O, HI PET, take the form: If Theory T is true, then Observations O will happen; O is seen, so we accept the Theory, T.**

✓ **Symbolically, we state this: $T \Rightarrow O$; O, so T.**

✓ **However, such an argument is rather like saying, "If Tom is a Pig, then Tom is an animal. Tom is an animal, so Tom must be a Pig."**

✓ **The logical problem here is that implication is not the same as equivalence: T being true may be sufficient for O to also be true, without O being sufficient for T!**

✓ **In fact, we use this in models: models simplify reality, and so are not strictly true; but they can give useful ("true") results.**

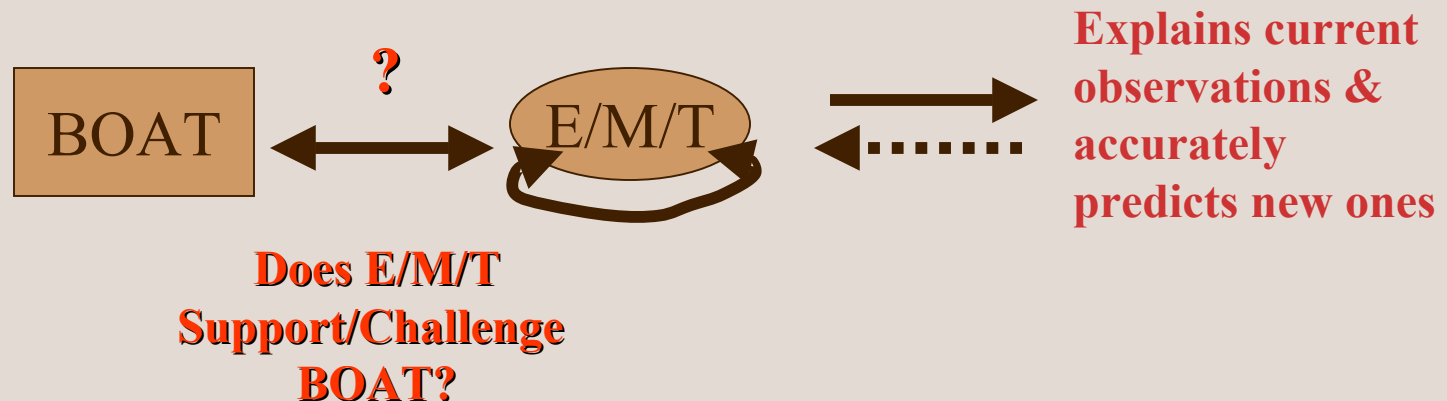✓ **However, it also means that scientific knowledge is provisional -- subject to clarification and correction.**

How is Science "Provisional"?

✓ **In Science, we seek the best current explanation/-model/theory [E/M/T] for observed patterns of events.**

✓ **This type of reasoning by explanation is called Abduction.**

✓ **However, abduction is asymmetric: the model may *logically entail* the observations, but as we just saw, a body of observations at best only provides *provisional empirical support* for such an explanation:**
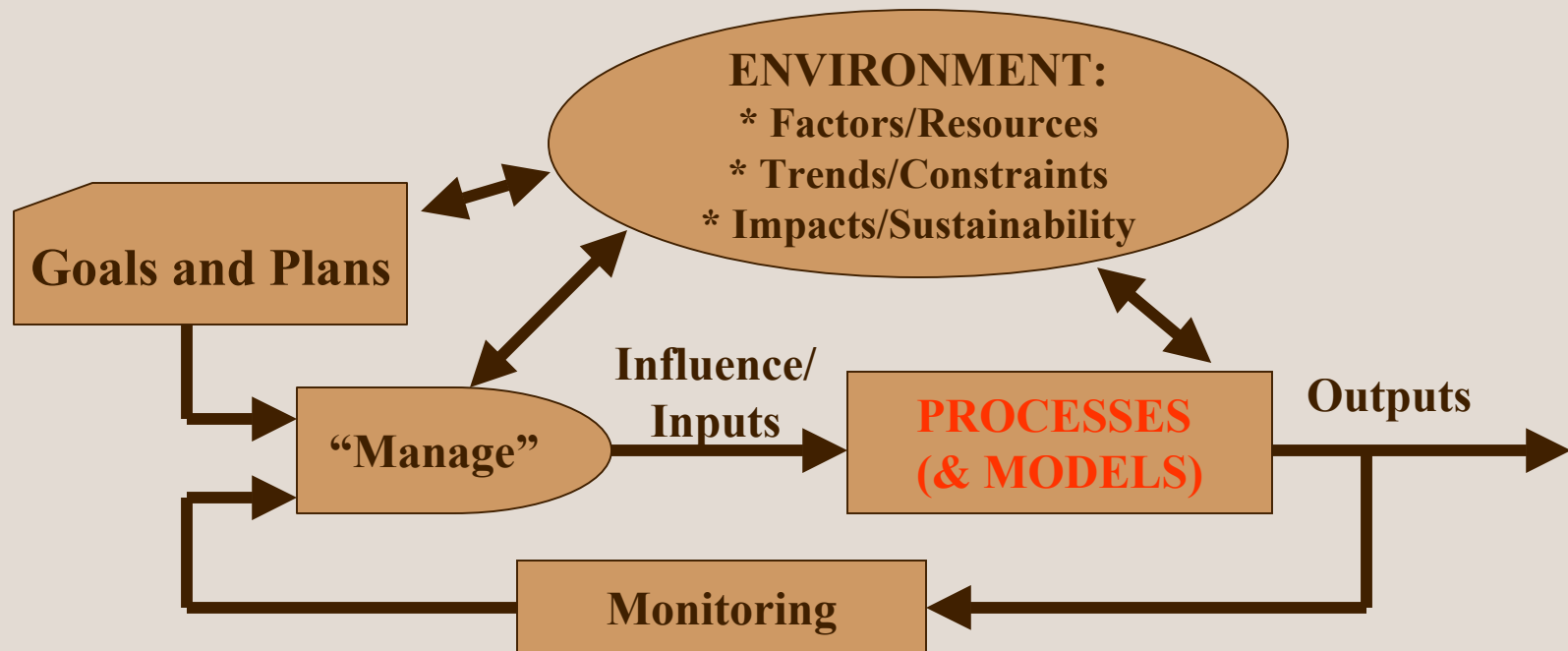

Implies?

E/M/T

Supports?

Body of explained/predicted observations

Self-consistent?
(If not, it refutes itself.)

Theories and Challengers

✓ **Explanations also have relationships with existing bodies of accepted theory [BOAT].**

✓ **They may be consistent, and mutually supporting.**

✓ **Or, sometimes a "best explanation" is well supported but challenges accepted theory; so, as happened 1880 - 1930, a Scientific Revolution may result, leading to a new BOAT.**

✓ **That is, accepted theories are "the best explanations so far":**

?

BOAT ⟷ E/M/T → **Explains current observations & accurately predicts new ones**

Does E/M/T Support/Challenge BOAT?

Models and Technology

- ✓ **Science is tied to Technology: we seek to "describe, explain, predict, and control (or, at least influence)" processes.**
- ✓ **Thus, we build and use "simplified" (thus *false*) models as a framework for controlling/managing/influencing socio-technological processes:**

ENVIRONMENT:
* Factors/Resources
* Trends/Constraints
* Impacts/Sustainability

Goals and Plans

"Manage"

Influence/ Inputs

**PROCESSES (& MODELS)**

Outputs

Monitoring

When is a "Fact" a Fact?

✓ **So, if false models and potentially false theories can give us true (and often useful) results, we must always be careful to test our models and theories against the observed facts of the world.**

✓ **But, what is a "fact"?**

✓ *OED* **defines: "Fact: 1 a thing that is known to have occurred, to exist or to be true. 2 a datum of experience."**

✓ **This begs the question, what is** *knowledge***: "3** *Philos.* **True, justified belief."**

✓ **So, we come back to intuition, experience and arguments that lead to the conclusion that certain beliefs are so justified that they can be called knowledge, however provisionally.**

✓ **But, where does all of this end up?**

Proof and Belief

✓ Say, we accept a claim A as true. Why?

✓ Because we accept B, further claims, arguments and evidence. Why accept B? Because of C, D ...

✓ So, we come to a chain of evidence and reasoning:
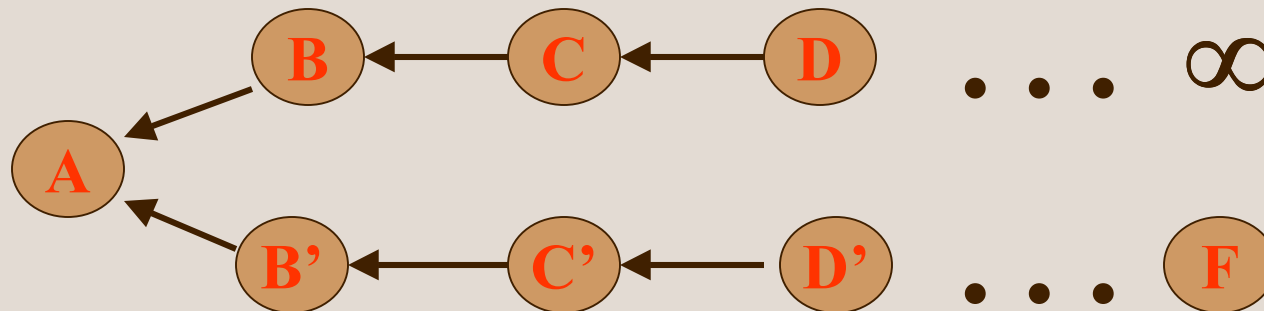
(That is, since we cannot carry out an infinite chain of proofs, we always have a **Faith-Point, F**.)

The Conclusion

✓ Clearly, when we try to reason, we always end up at a Faith-Point, where we accept some claims as self-evidently true or at least incorrigible or plausibly true without further proof.

✓ For instance, consider "Error exists." (This claim is self-evident, as to try to deny it affirms it! It therefore implies that there are objective truths, and that we can be mistaken about them.)

✓ So the issue is not faith vs. reason, but which faith is most reasonable. For, all men "live by faith."

✓ So, which faith is most reasonable? Why?