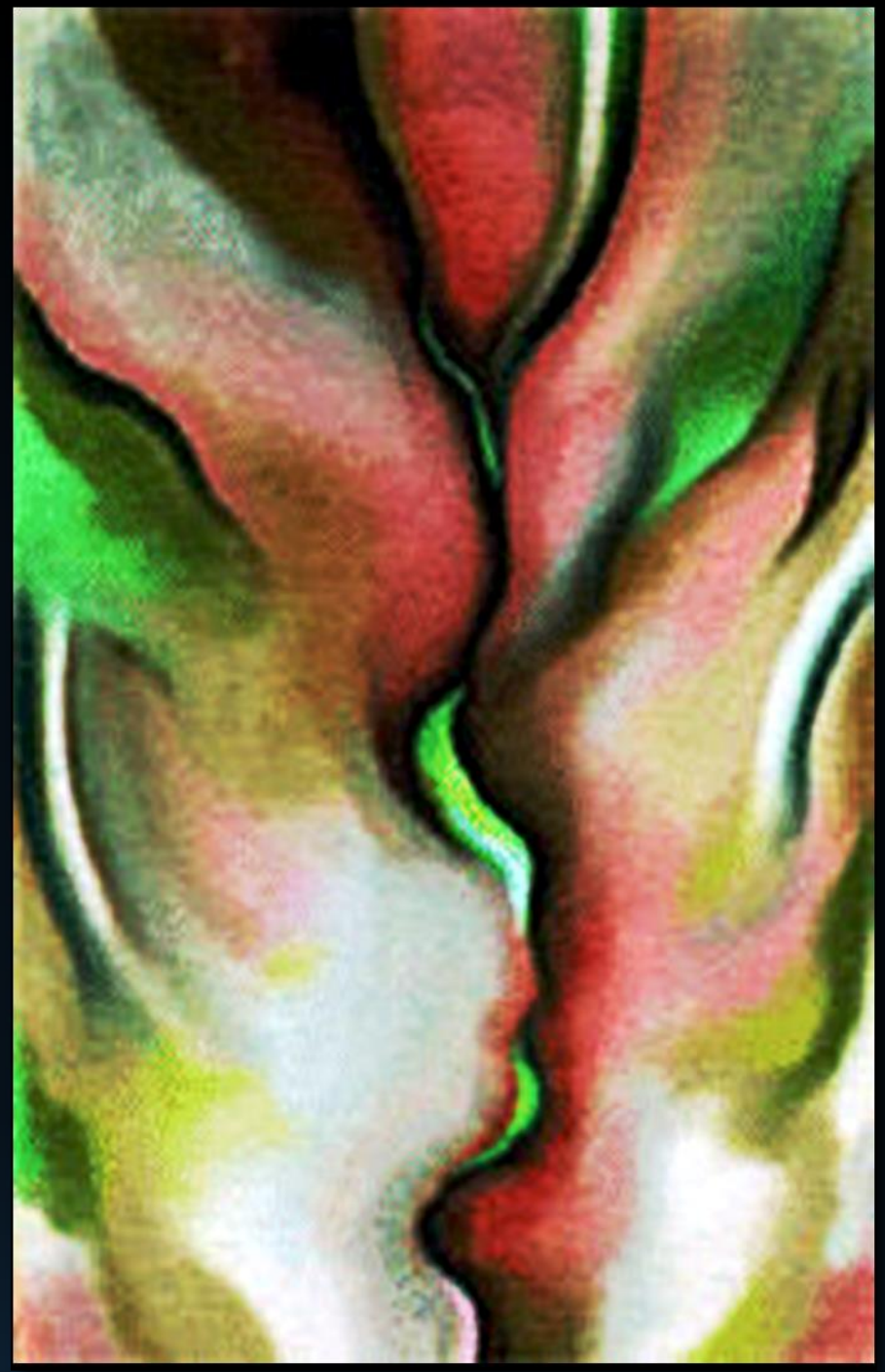
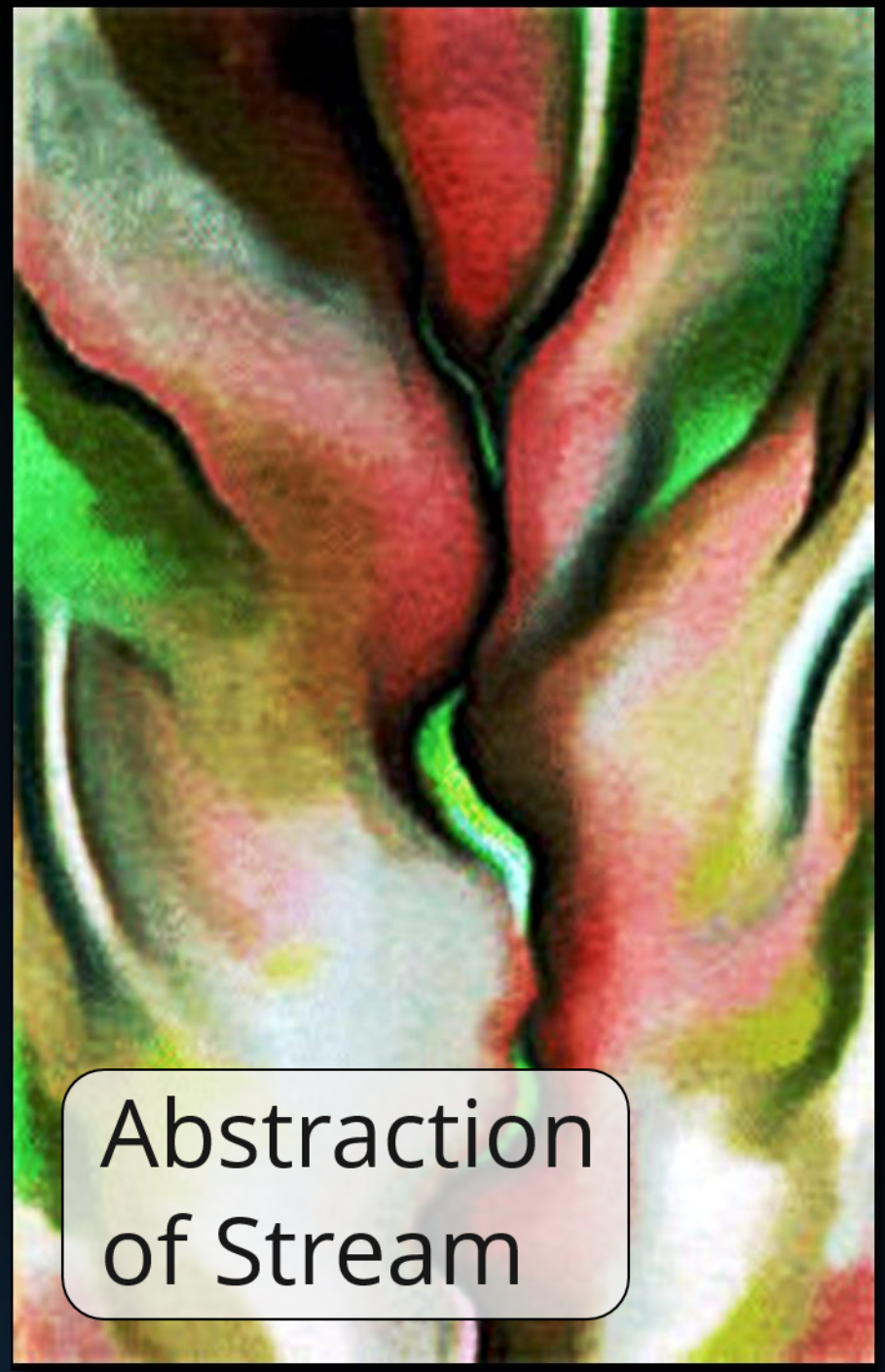


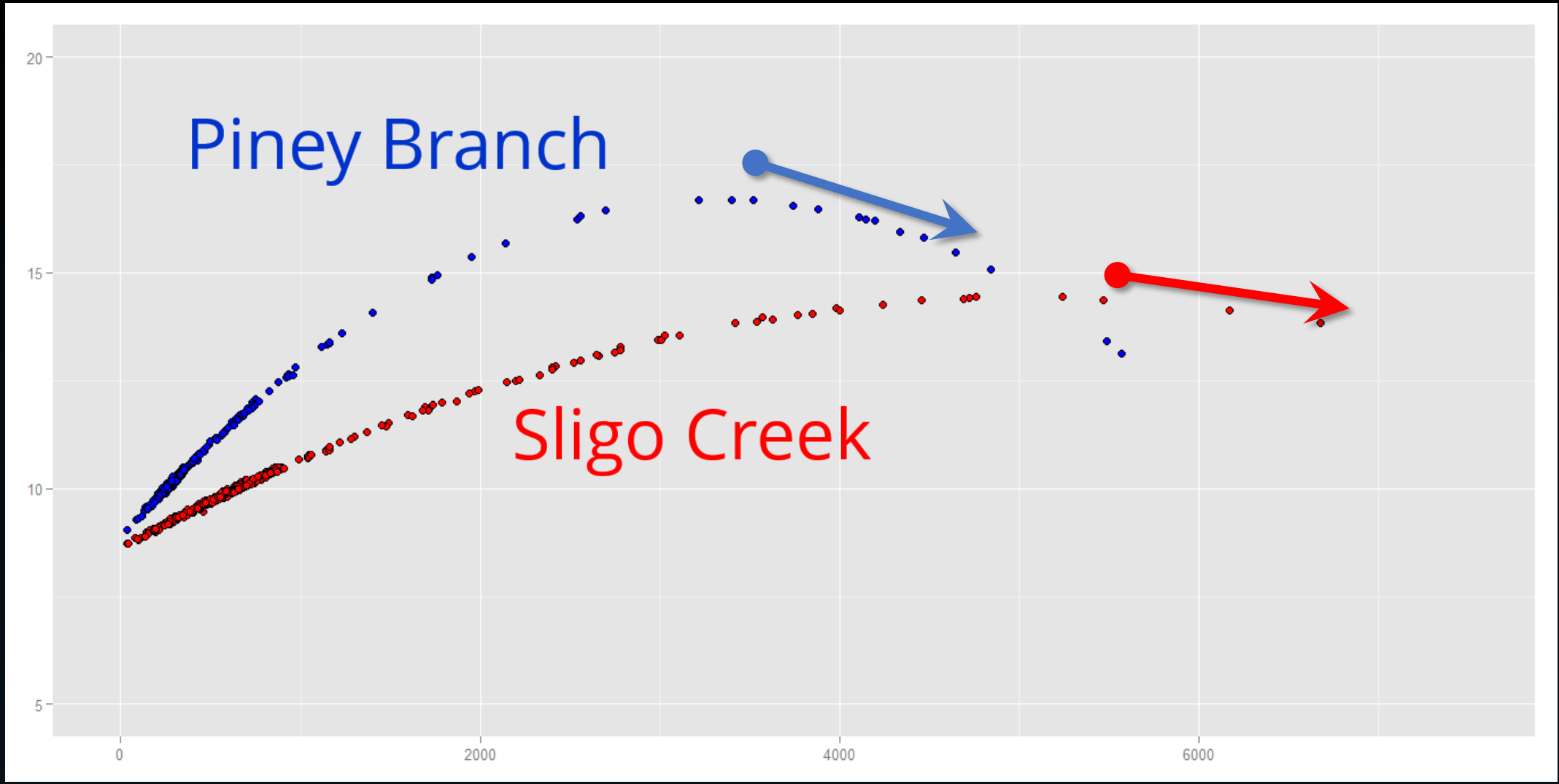
Defending public health models in the courtroom

<pasky pascual>



It is only
by selection,
by elimination,
by emphasis,
that we get at the
real meaning of things.

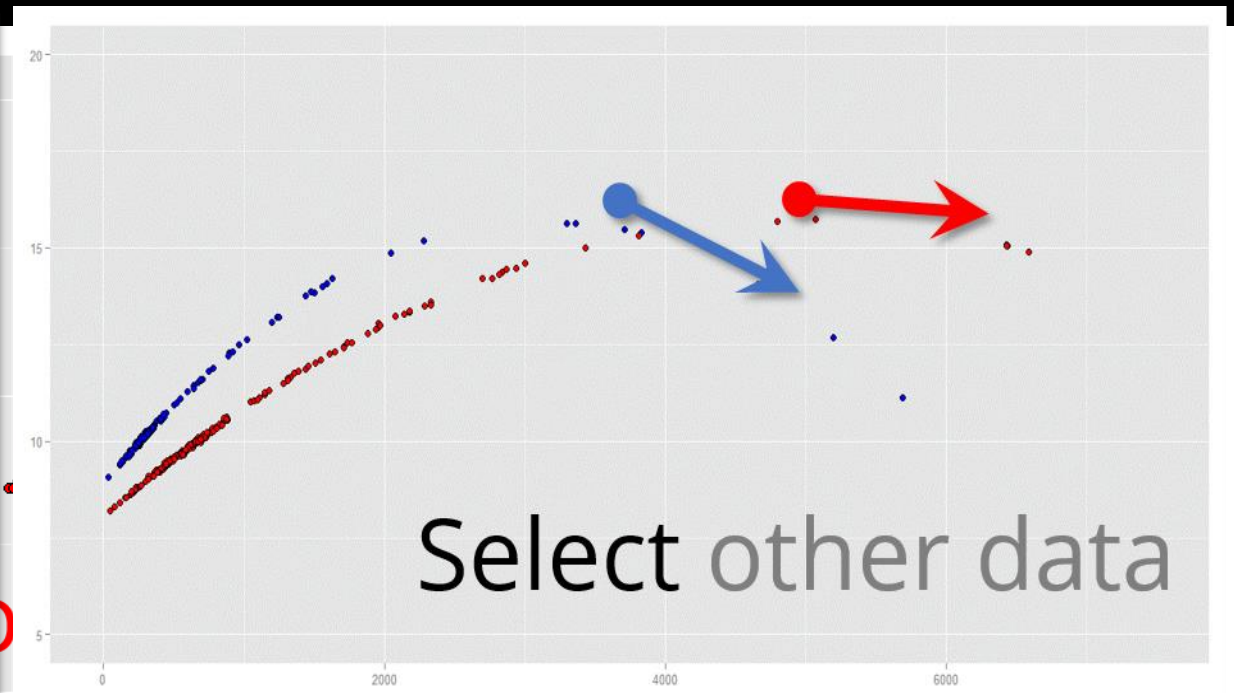
oxygen

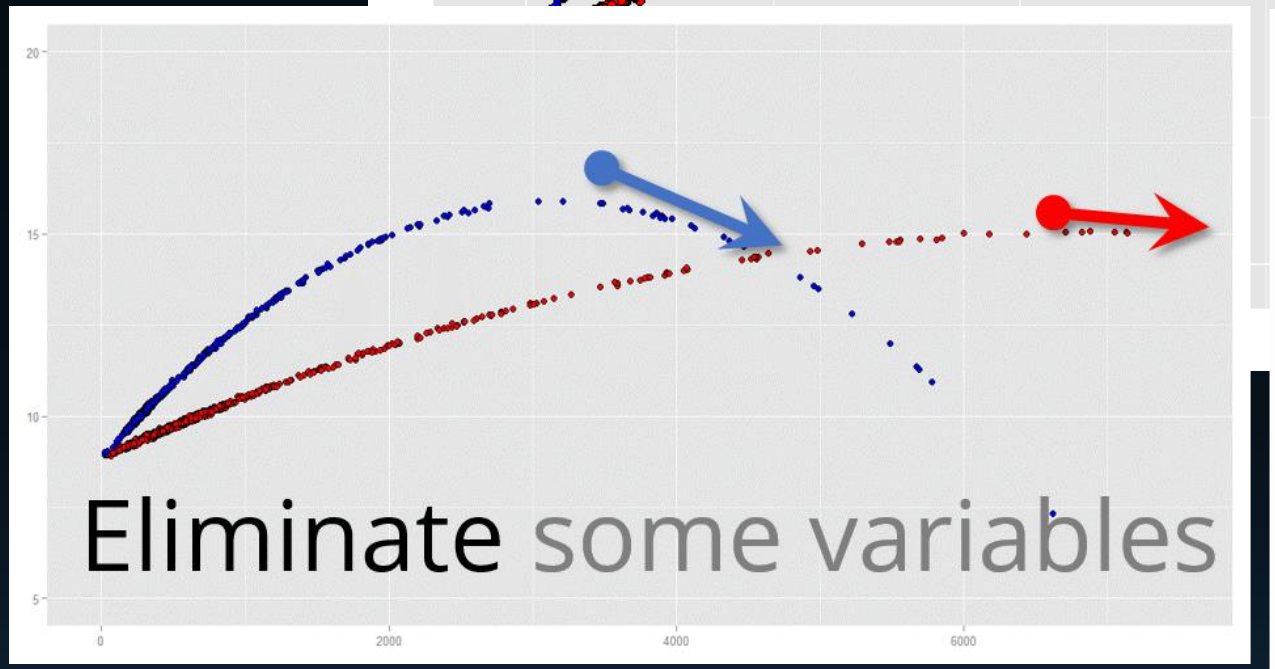


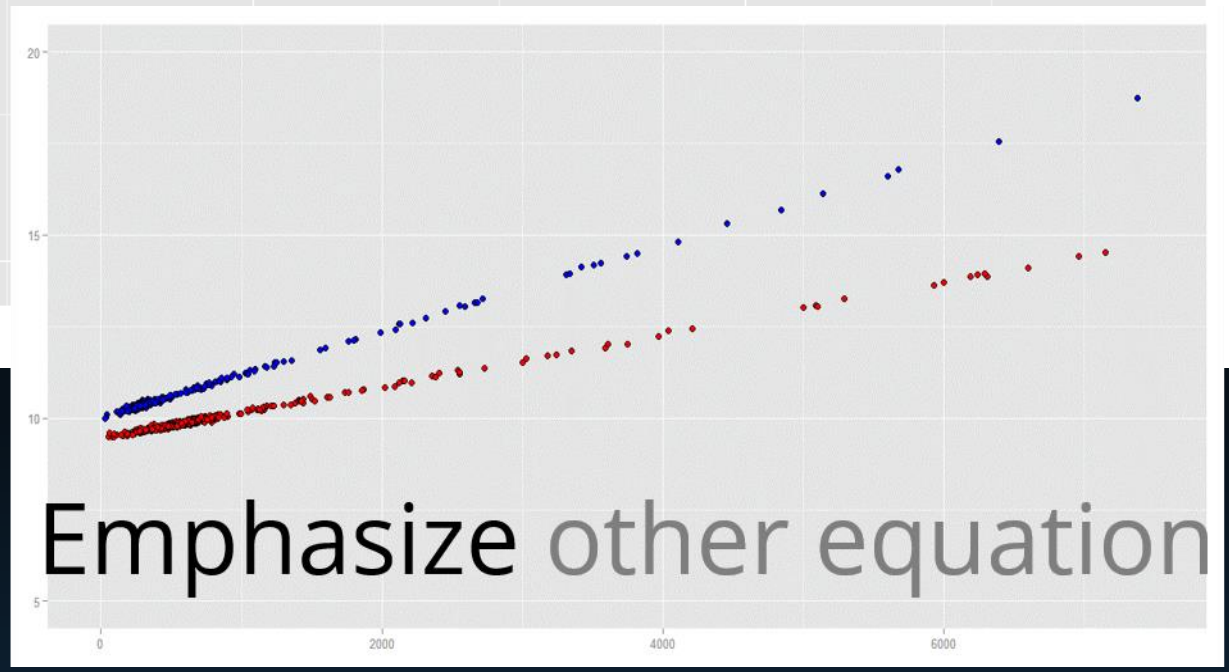
charged particles

Abstraction of Stream


Original Model


Select other data


Eliminate some variables


Emphasize other equation

#ModelsAreEverywhere

Models establish
rights and obligations
in public health and
environmental law.

(Fisher, Pascual, Wagner 2010)

#ModelEvaluation

Models are neither
'truth machines' nor
completely malleable.

(Wagner, Pascual, Fisher 2010)

#ModelTransparency

Models must arise from transparent, appropriate methods and epistemic frames.

(Pascual, Wagner, Fisher 2013)

#DefensibleModels

Model transparency yields legal accountability and defensibility.

(Fisher, Pascual, Wagner 2015)

Air Quality Standards

- protect public health
- based on latest science
- reviewed by science panel
- subject to judicial review

‘ controlled human exposure studies … engender the highest level of confidence … about the causal relationship between ozone exposure and health effects… ‘

Mississippi v. EPA (2013)

Controlled human studies or observational studies that rule out chance	Causal
Observational studies with possible confounders and animal toxic studies	Likely Causal
High quality study shows association or suggests effect	Suggestive of Causal
Insufficient quality, quantity, consistency or statistical power	Inadequate to infer Causal
Multiple studies show no effect	Not likely Causal

Causal / Likely Causal

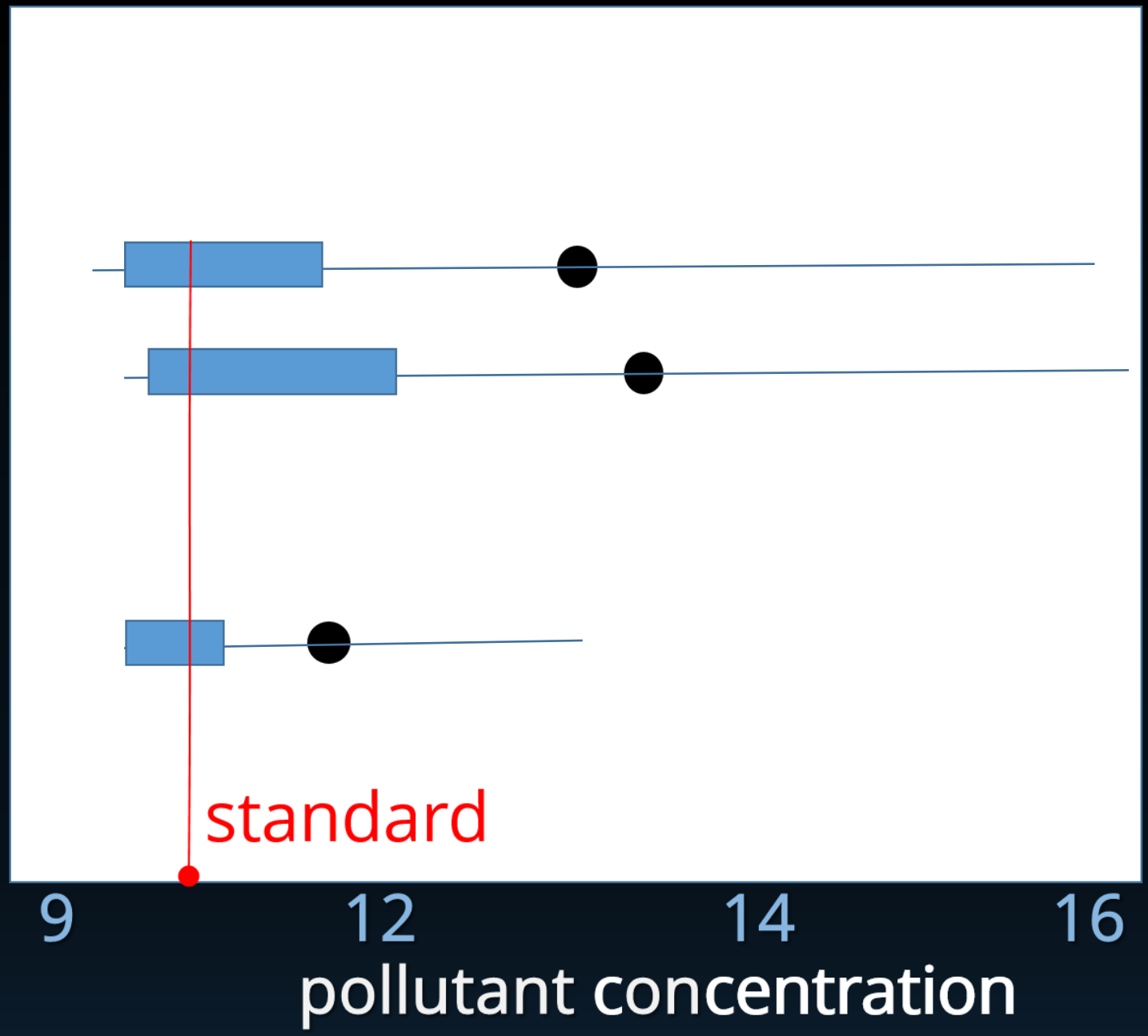
mortality (Miller 2007)

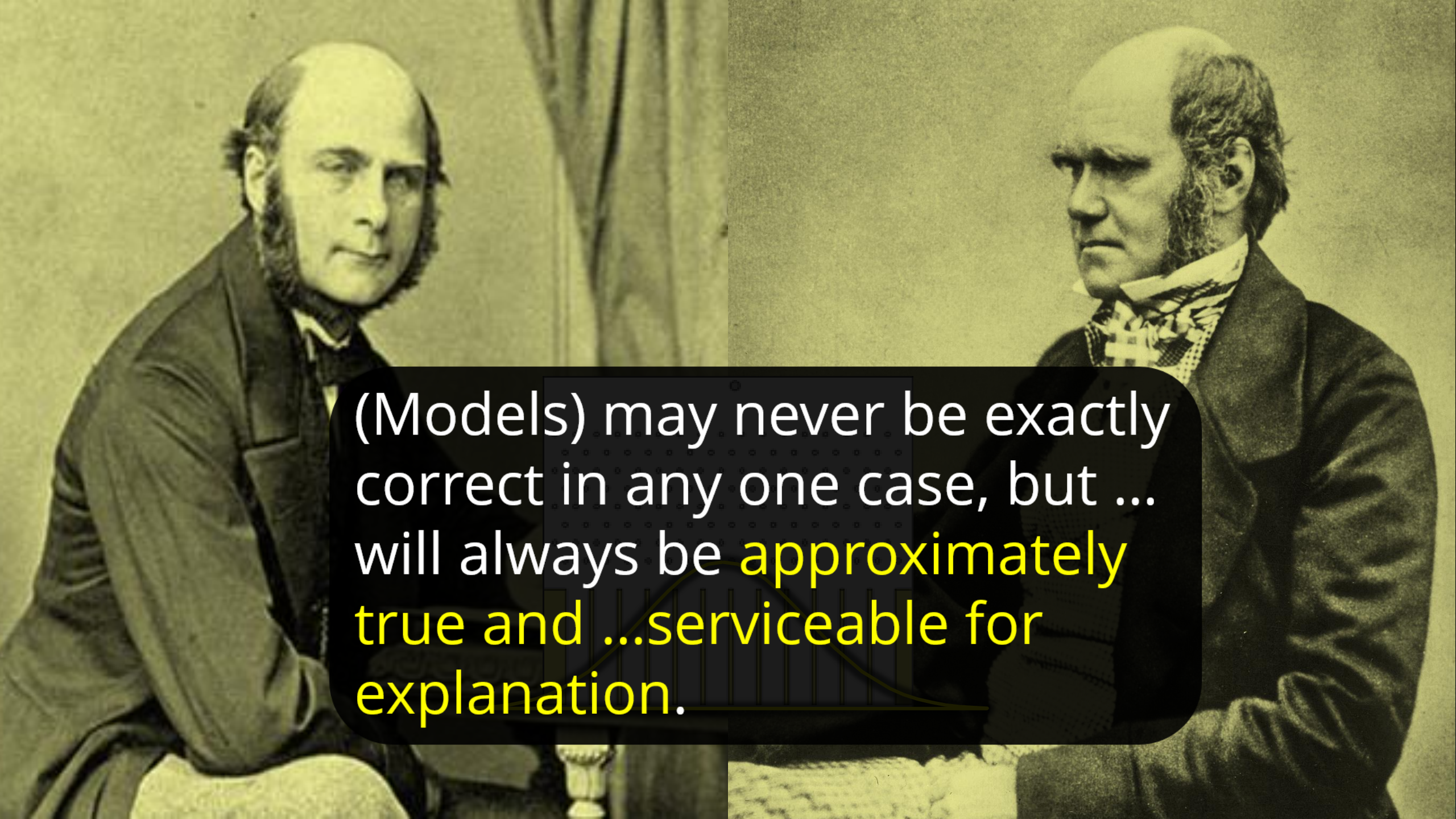
mortality (Krewski 2009)

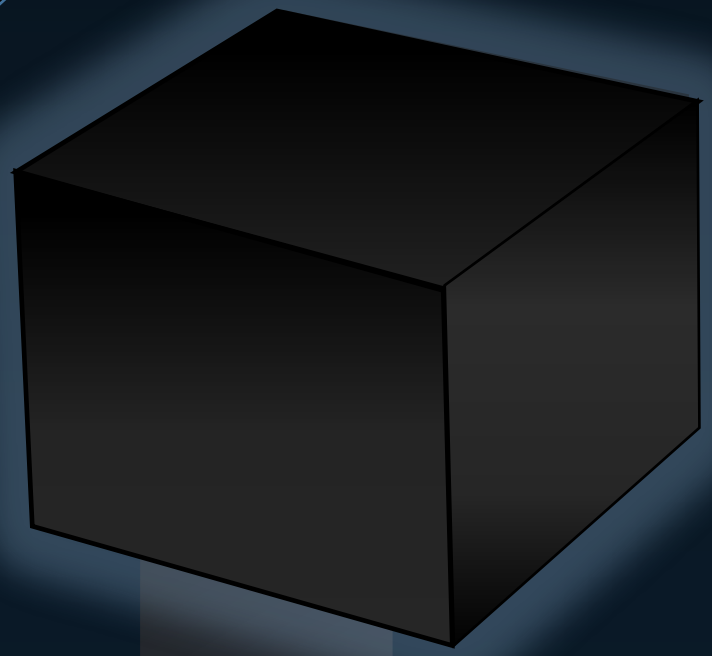
Suggestive of Causal

hospitalization (Bell 2009)

etc.




(Models) may never be exactly correct in any one case, but ... will always be approximately true and ...serviceable for explanation.

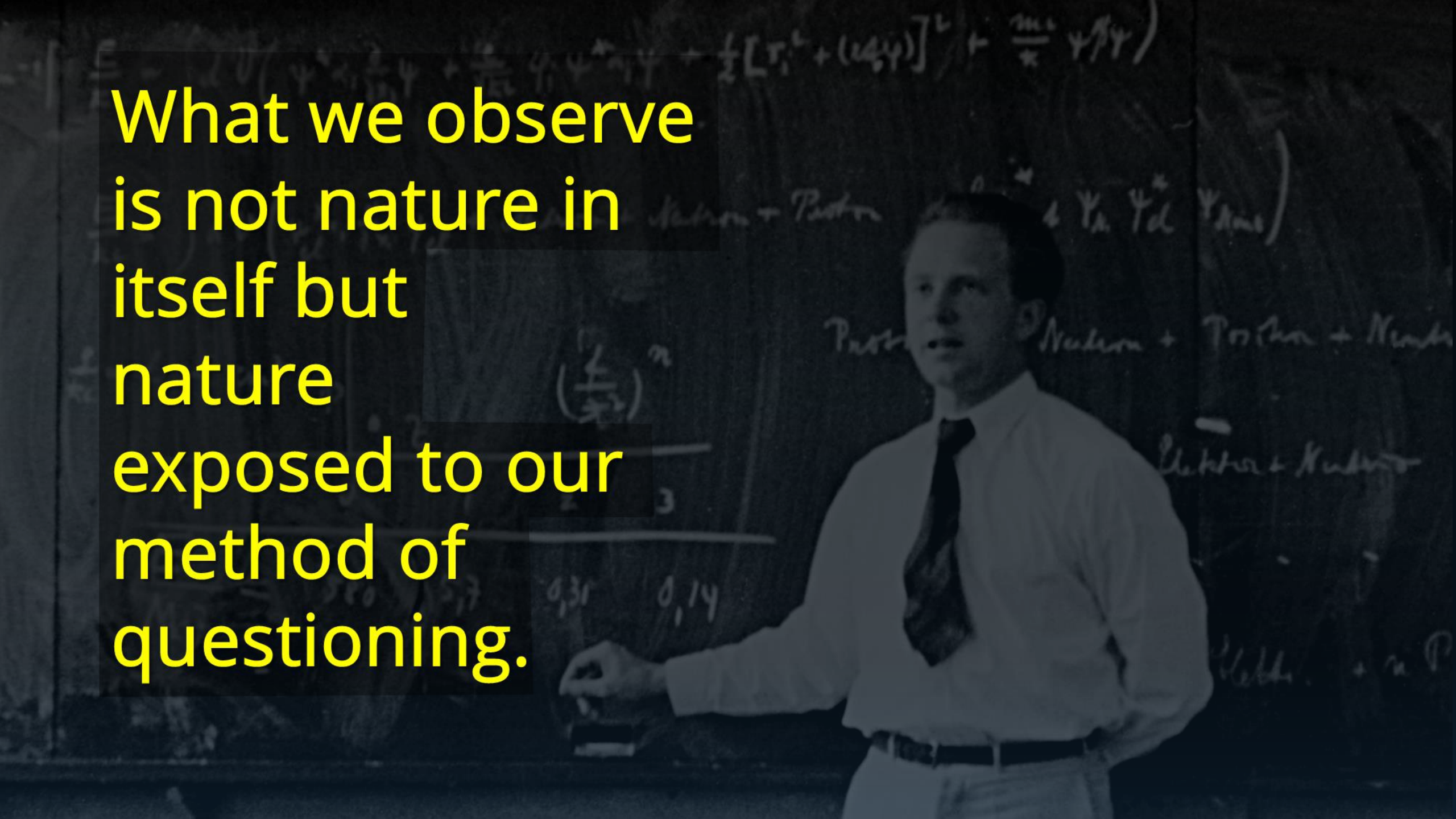


Model Evaluation

Expert Panel

Court

Stakeholders


What we observe
is not nature in
itself but
nature
exposed to our
method of
questioning.