

Meeting 1.3: Science and Objectivity

Summary

In our first meeting about scientific progress, we fell into a conversation about Objective and Subjective interpretations of science. Both the essays today show that a pure state of either category is impossible.

In *Objectivity*, Daston and Galison present the idea of “Mechanical Objectivity” that took hold of the science world around the turn of the 20th century: “the insistent drive to repress the willful intervention of the artist-author, and to put in its stead a set of procedures that would, as it were, move nature to the page through a strict protocol, if not automatically.” This attitude was epitomized by photograph atlases: images of artifacts with as little intervention as possible between the object and the reader of the atlas. The movement revealed that previously accepted illustrations of phenomena were highly idealized and symmetrized.

Mechanical Objectivity is more-or-less what most of us have in mind when we think about “objective” facts: things that exist independent of human will. The authors point out however, that this ideal was very much a product of the time: machines were seen to embody the virtues of patience, precision, and focus. They had not the temptation of pride to prevent them from giving an honest presentation of facts. With the advent of photography, humans felt failed by their own senses: how can they for so long have seen what was not present? Thus, the notion of objectivity has a very human ethical-historical component as well.

In *True Enough*, Elgin observes that in order to serve greater cognitive ends (i.e., in order to understand something), we use statements that are not true. She calls these “felicitous falsehoods.” She further claims that these can be *preferable to true statements* when they serve as better exemplars of whatever feature of a phenomenon we are trying to understand: “A felicitous falsehood thus is not always accepted only in default of the truth. Nor is its acceptance always ‘second best’. It may make cognitive contributions that the unvarnished truth cannot match.” Ultimately, statements must be “true enough” for the purposes at hand: “*to accept that p* is to take it that *p*’s divergence from truth, if any, does not matter... The falsehood is ‘as close as one needs for the purposes at hand.’ (Stalnaker 1987)”

Elgin’s concept of exemplification also highlights that images only highlight certain aspects of what they are showing. Furthermore, an exemplar may only be appreciated as such where certain background assumptions are in place. Thus the idea of Mechanical Objectivity is unraveled, since there will always need to be some commentary on what we are looking at in order for it to communicate true and relevant information. It comes down to the fact that we are always extrapolating. For example, when looking at an atlas, we are not interested in this particular seashell, but in seashells in general. So I need to know *what about the picture* I should be gleaning about seashells.

Elgin highlights that truth is not the only thing scientists are after. Moreover, our truth claims are a patchwork of facts and untruthful appendages. This is OK! We already accept a number of untrue statements because they are useful. Many statements exemplify a scientific system or problem and define a domain of study. Others approximate the truth so nicely that they are useful for our purposes. Overall, the “cognitive goodness” (129) is the threshold of acceptance for a claim.

Cognitive goodness can be reread as an epistemic norm, bringing us back to Daston and Galison. Mechanical Objectivity highlights one such standard for accepting truth claims; one that is reliant on the self-discipline of the scientist and an attempt at unmediated representation of the natural world. Importantly, Daston and Galison show that these epistemic standards have a metaphysical, an ethical, and a methodological layer. This drags Elgin's framework into the thorny troubles of history. "Cognitive goodness" may be a good standard to save truth, but it tells us nothing about the added baggage that comes with our criteria.

Discussion

- In Objectivity, Daston and Galison write that "instead of freedom of will, machines offered freedom from will." When is the job of a physicist to be a passive observer? Could there be any meaningful science at all without humans projecting a theory at some point in the process of observation and analysis?
- Does science progress? Is "true enough" a tale of progression? What of the break in "Objectivity Shock" (the opening vignette of Objectivity)? Can scientific progress exist in these pictures?
- What apparatuses that are external from truth are integral to science? Elgin highlights "cognition" as important while Daston and Galison focus on historically contingent virtues and vices that appear in the scientific community.
- The difference between Elgin and the approach described in Objectivity ultimately lies in the goals of science. Mechanical Objectivity is focused on *describing* the world as-is, while instead, Elgin champions *understanding*. Which one of these understandings appropriately characterizes modern science? Can understanding be achieved within a Mechanical Objectivity framework (in other words, can staring at an atlas lead to understanding, or will it always be just a description)?
- Elgin points out that in order to properly exemplify and study particular phenomena, "highly artificial" situations and materials must be contrived. She references an opinion (that she does not necessarily subscribe to) that therefore, the laws of physics are a lie that attempt to project from fiction onto fact. Does the "stage-setting" involved in modern science detract from its descriptive quality? Is there a level of "contrived-ness" that renders an experiment fictional (computer simulations come to mind)? In other words, are there statements that cannot be "true enough" for any scientific ends?
- Mechanical Objectivity eschews the "temptation of aesthetics," yet much of modern physics favors theories on the bases of beauty, parsimony, symmetry, and other decidedly esthetic standards (think particle physics). Have we returned to a pre-objective paradigm? Is there a divide here between theorists and experimentalists?
- What do we do with truth? Daston and Galison shy away from the concept while Elgin attempts to take it head on. What are the benefits or pitfalls of taking truth as the primary motivation to explore the natural world?