

SHADOWS OF EVIDENCE

We walk around the world with a bewildering network of opinions, beliefs, and judgments, some of them ephemeral (*I think that I won't need an umbrella today*) and some vital (*I trust that person*).

Why is the sky blue? Why do you believe you are mortal? Why is four twice two? How do you know that George Washington actually existed?

If we have an opinion about such a question, then when we are challenged, we offer what we think counts for evidence. We hope, of course, that our evidence persuades our challenger (i.e., we hope that our rhetoric is up to the task) but more importantly, we hope that our evidence really justifies our opinion.

Different branches of knowledge—the Humanities, the Science, Mathematics—justify their findings differently; they have, one might say, quite incommensurate rules of evidence. Often a shift of emphasis, or framing, of one of these disciplines goes along with, or derives from, a change of these rules, or of the repertoire of sources of evidence, for justifying claims and findings in that field. Law has, of course, its own precise rules explicitly formulated.

Even the way the word *evidence* is used can already tell us much about the profile of an intellectual discipline. To take a simple example, consider Charles Darwin's language in *The Origin of Species*—specifically, his use of the words *fact* and *evidence*—as offering us clues about the types of argumentation that Darwin counts in support, or in critique, of his emerging theory of evolution¹. Sometimes Darwin provides us with a *sotto voce* commentary on what *shouldn't* count—or should only marginally count—as evidence, such as when he writes:

But we have better evidence on this subject than mere theoretical calculations.

He spends much time offering his assessment of what one can expect—or not expect—to glean from the fossil record. He gives quick characterizations of types of evidence—'historical evidence' he calls 'indirect' (as, indeed, it is in comparison with the evidence one gets by having an actual bone in one's actual hands). These types of judgments frame the project of evolution.

The subsequent changes in Darwin's initial repertoire, such as evidence obtained by formulating various mathematical models, or the formidable technology of gene sequencing,

¹As is perfectly reasonable, Darwin reserves the word *fact* for those pieces of data or opinion that have been, in some sense, vetted, and are not currently in dispute; The word *evidence* in *The Origin of Species* can refer to something more preliminary, yet to be tested and deemed admissible or not. Sometimes, if evidence is firmer than that, Darwin will supply it with an adjective such as *clear evidence* or *plainest evidence*; it may come as a negative, such as “there isn't a shadow of evidence.”

etc. mark changes in the types of argument evolutionary biologists regard as the constituting a genuine result in the field—in effect, changes of what they regard *evolutionary biology* to be.

Mathematics—a domain in which one might think the issue of evidence to be fairly straightforward (“you prove a theorem or you don’t”)—will, as we shall see, turn out to be not at all clear; it has its own history of the shaping of types of evidence.

If we accept that the shape and mood of a field of inquiry is largely, or even just somewhat, determined by the specific kinds of evidence needed to have consensually agreed upon *findings* or *results* in that field, it becomes important to study the—perhaps peculiar—natures of *evidence* in different domains to appreciate how those distinct domains fit into the greater constellation of intellectual effort.

Taken in a straightforward way, this might well be an epistemological project within the scope of something that is taught by the Philosophy department. But instead, we want to view this seminar-course as a conversation between different practitioners (with a number of experts contributing to lectures and discussions). In particular, it would be very useful to learn, in some specificity from people in these fields—via concrete examples graspable by people outside the field—what evidence consists of in *Physics, Economics, Biology, Art History, Mathematics, and Law*. Once we look with a microscope at the structure of evidence in any of these fields, we expect that even though this structure will be specific-to-the-field, and a moving target, the project of understanding it in a larger context will be very much worth doing. As mentioned, we are aiming—while studying concrete examples in different fields—for a comprehensive view and not merely a fragmented “evidence-in-X, evidence-in-Y, etc.” with no matrix that ties these bits together.

It would also be good to compare what we learn from experts with the informal texture of evidence that we all use for justification of our judgments, in daily life. One big issue is Statistics, which occurs as a field in itself with its own rules of evidence, but is also omnipresent as a crucial mode of formulating numerical evidence in other fields—a kind of lingua franca for quantitative assertions².

²The Bayesian versus Frequentist issues might deserve particular discussion.