

The Possibility of Technical Definition in Later Wittgenstein

James M. Donovan
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Ludwig Wittgenstein's later work, *Philosophical Investigations* [*PI*], reoriented analytic philosophy from its emphasis upon language's logical structure and onto a new priority of language's grammatical use. The meaning of a sentence, he now argued (in contrast to his earlier *Tractatus Logico-Philosophicus*), was to be found not in an underlying logical framework, but in how it is used by ordinary language speakers: "What is supposed to shew what they signify, if not the kind of use they have?" (*PI* ¶ 10). This new approach has remained influential, although the attempts to apply it have revealed that it is less than completely successful as an exhaustive reduction of all philosophical problems into grammatical puzzles.

One problem of Wittgenstein's method, one not commonly considered in most treatments of his scholarship, is the place that his analysis of language would assign to the technical definition that is the basis of the scientific method. Specifically, if all meaning is assigned by conventional uses, then little opportunity remains to stipulate a technical meaning that may diverge from the ordinary use of the term. If such stipulation were possible, then one could stipulate meaning for any term at all, with the result that meaning of all words is at least potentially attached to the terms themselves, rather than emerging out of their uses in ordinary speech. Acceptance of stipulated technical definition, in other words, contradicts the primary thesis Wittgenstein argues in *PI*. If the grammatical philosophy of *PI* cannot be read to allow for the type of definition required for science, then Wittgenstein's philosophy may lead to the result that scientific *method* is

not possible, and therefore perhaps neither is *science* itself as it is commonly (ordinarily, even) understood.

That conclusion would seem to require the ejection of either science or Wittgenstein from the field of tenable intellectual projects. But while we would wish to retain science for obvious reasons, “later Wittgenstein” too has many valuable insights such that we would not endorse wholly discarding this work. The bulk of this paper, therefore, after outlining the principle points underlying each of Wittgenstein’s philosophy of language and scientific definition, attempts to identify a way that a rapprochement can be achieved, one that would preserve the critical insights offered by Wittgenstein while describing a technique of scientific definition that can operate within that milieu.

Wittgenstein’s Philosophy of Language

Philosophical Investigations represents in many ways a rejection of Wittgenstein’s own arguments in his earlier *Tractatus*. Compare the arguments of *PI* with the *Tractatus* claim that “Most of the propositions and questions of philosophers arise from our failure to understand the *logic* of our language” (§ 4.003, emphasis added). The position represented in this prior statement is that the surface manifestations of language are messy, confusing, and inexact. The work of philosophy (and of the analytic philosophers particularly, especially after Bertrand Russell) unmask the logical structure hidden beneath any particular verbalized statement (e.g., “The present king of France is bald”). The revealed deeper structure assigns meanings with exacting precision, eliminating ambiguities that have crept into the surface statement. Wittgenstein suggested that most philosophical debates arise out of a failure to properly attend to this

logical structure of language, and are therefore more misunderstandings of language than true problems.

Wittgenstein would, in his later work, push this general conclusion to its most extreme. Not only would he now deny that philosophy had *any* real problems, instead only “puzzles” (“Philosophy is a battle against the bewitchment of our intelligence by means of our language” (*PI* ¶ 109)), he would arrive at this result by inverting his previous analysis. The surface appearance of language—what it is that people actually say—is no longer characterized as an inept communication of a deeper meaning that can be revealed to be more precise. In *PI* these statements are what they are; which is to say, largely conforming to the particular language game being played when the sentence is expressed. There is nothing “more” or “deeper,” much less “hidden,” about the language used than what appears in the exchange: “nothing is more wrong-headed than calling meaning a mental activity!” (*PI* ¶ 693). By contrast, much of *PI* devotes itself to demonstrations of the claim that searches for just such “hidden” logical structures and meanings result in nonsensical findings. His extended arguments map out the grammatical uses of words like “know” and “understand,” highlighting how their observed uses differ markedly from the theoretical interpretations offered accounts of those experiences. Wittgenstein devotes considerable space as well to dispel assumptions that talk about sensations built upon Jamesian psychological introspection of inner states rather than following from rules of use for that kind of talk.

By any standard *PI* is a difficult and frustrating text. The challenge for Wittgenstein is to find a way to argue his point without providing another example of a problem “solved” by philosophical analysis. He cannot, therefore, structure the book in

the manner expected of such a work, involving theses and proofs and arguments and demonstrations, as such an expository technique would implicitly refute his broader point that there are no problems to be solved. His solution to this expository dilemma is to employ a jambalaya of aphorism, snippets and asides that evokes no predecessor's style as much as Nietzsche's *Thus Spoke Zarathustra*. By Part II of *PI* the text all but seemingly disintegrates into a hodgepodge of notes and scribbles. The book's clarity was probably not helped by its being compiled and published posthumously.

The obscurantist construction of the text has left many details contentious. Saul Kripke's *Wittgenstein on Rules and Private Language* (1982), for example, offers one controversial reading of some of *PI*'s central arguments (a reading derived from Kripke's efforts to impose a logical order upon Wittgenstein's at times disjointed and rambling comments). And Soames (2003, p. 60) lists the following problems with text:

Looking back at the *Investigations*, there is no doubt that the work still retains much of its fascination. Nevertheless, it is hard, from today's perspective to ignore the flaws at its core—including (i) the identification of the philosophical with (a subset of) the necessary and the apriori, (ii) the further identification of these with the analytic, (iii) the conception of meaning as essentially transparent, (iv) the closely related deflationary conception of philosophy and philosophical analysis, and (v) the unwaveringly informal and antitheoretical approach to the study of meaning.

Still, a few uncontroversial observations can be ventured that avoid most of these pitfalls.

Perhaps the most general conclusion of *PI* is that meaning is nothing more than the ways in which a statement is used in discourse (*PI* ¶ 43), often reduced to the slogan "Meaning is Use." [Soames (2003, p. 4) appears to endorse this paraphrase of Wittgenstein's primary thesis, but Marie McGinn (1997, p. 110) disagrees, saying that "it

would be a mistake to suppose that the force of [Wittgenstein's] remarks is to be summarized by means of the following claims: Meaning is use. Speaking a language is a practice.”] Language is to be analogized as a game such as chess, which people play together according to known rules. If language has this structure of being a kind of game, then it would seem to follow that the meaning of any particular statement is tied to the social context in which it occurs, rather than being an abstract property that inheres essentially in the statement itself. To know what a sentence means, in other words, requires knowing the context in which it was uttered, and thereby the work it was intended to accomplish. From this it follows that the meaning of language is open and observable to all; clarifying meaning is a puzzle to explicate the grammatical context in which the statement is embedded, and not a problem of excavating a hidden logical structure.

Wittgenstein argues famously against the possibility of a private language, one whose meaning is known only to one person: the “correct” use of a term is determined by rules, and adoption of such rules is an inherently social action, one that emerges out of the actual behaviors of real people. Without that social convention as a standard, it is impossible to determine whether a “private” use has been correctly applied or not, and thus it is not possible to claim that it “means” anything in particular. (By the same token, it is also not possible to judge a private use as *incorrect*!)

At this broad level of generalization, at least, it would be difficult to deny Wittgenstein his primary points. It is indeed impossible to know the meaning of the exclamation “Fire!” without knowing when and how it was uttered: as part of a firing squad execution? Upon observing a home engulfed in flames? As a joke in a crowded

theatre? If the meaning of even this simple, one word sentence is not self-evident upon the word itself, less likely shall it be that we can know the intended meaning of any more complex statement. This insight is robust, and any solution to the present problem that suggests it should be discarded is fundamentally in error.

The Need for Precise Scientific Definition

One of the hallmarks of the scientific method is reproducibility. Changing lead into gold in the privacy of my laboratory is alchemy; changing lead into gold, and then publicizing the technique so that others can verify or refute the result, is science. Karl Popper—the grey-beard of the philosophy of scientific method—denied that Sir Henry Cavendish’s experiments qualified as science because, although he is credited with the discovery of hydrogen and one of the earliest accurate estimations of the density of the earth, these studies were conducted in secret (Edmonds & Eidinow 2001, p. 271-272).

The demands of reproducibility place a heavy burden on the criterion of identity. To replicate my experiment, you must use the same kinds of things that I used: what you are calling “lead” must be identical to what I called “lead,” and so on. Without that standard, no conclusion follows from your inability to reproduce my ability to transform this lead into gold, since you were not doing the same experiment, but an altogether different one.

For this reason science requires an exacting definition of its relevant terms in order to bring uniformity to its methods. The question to be asked is whether this level of precision can co-exist with Wittgenstein’s isolation of *ordinary* use as the criterion of meaning. He gives us reason to doubt that this can be achieved: “When philosophers [and scientists are, after all, nothing but natural philosophers!] use a word—“knowledge”,

“being”, “object”, “I”, “proposition”, “name”—and try to grasp the *essence* of the thing, one must always ask oneself: is the word ever actually used in this way in the language which is its original home?” (*PI* ¶ 116). If meaning is determined under ordinary use, and philosophers of all stripes are inclined to extract terms from that environment and assign artificial definitions, what “meaning” can they actually have? On the contrary: “Philosophy may in no way interfere with the actual use of language; it can in the end only describe it” (*PI* ¶ 124). The opening for a controlled and precise terminology for science, therefore, appears slim.

Definition ≠ Meaning

Wittgenstein’s interest in *PI* is with meaning, with only occasional (and not always insightful) mention of definitions. We are left, therefore, to ferret out for ourselves what place definitions have within his thoughts about the meanings of words.

In one sense definition is meaning, certainly within the environment of ordinary use. A proper reply to a question about what a word “means” is to offer a definition. However, the *Oxford English Dictionary* then follows these (often multiple) definitions with exemplars of the word in use. The relationship between these two approaches is not immediately obvious: do the definitions *impose* proper use upon the examples, or are the definitions *derived* from the examples? In other words, which came first, the definition or the use of the word? [That the samples follow the definitions perhaps suggests that the *OED* views the latter as determining the former.] With good reason Wittgenstein might suggest we are seeing in the *OED* two kinds of responses to the question after meaning that are in fact not reducible to one another.

Several scholars have concluded that a word's meaning and its definition are nonequivalent. On the one hand a definition serves only referential functions; on the other "meaning of a word or phrase is not its dictionary equivalent but the difference its utterance brings about in a situation" (Kluckhohn 1985, p. 146-147). This position is similar to Bloomfield's understanding of "meaning" as "the situation in which the speaker utters it and the response that it calls forth in the hearer" (quoted by Osgood, Suci and Tannenbaum 1957, p. 2), as well as Taylor's (1970, p. 151) holding that the meaning of a word is "its use, the way people use it, and...differences in meaning [are] differences in these uses." All of these statements reflect Wittgenstein's influence, and sharply distinguish the problem of meaning from that of definition. Hilary Putnam agrees, noting that "an extensionally correct truth definition can be given which is in no sense a theory of the meaning of the word" (1975, p. 259). William Alston (1964, p. 2) similarly refers to the "confused assimilation of meaning and reference." The gist appears to be that while knowing a definition of a word is not to know its meaning (entirely), to know a word's meaning is to know its definition, and then some.

If meaning and definition are not synonymous, the problem (puzzle?) becomes to recognize how they are related within *PI*.

The Place of Definition within Wittgenstein's Philosophy of Meaning

Although Wittgenstein opens *Philosophical Investigations* with an extended refutation of Augustine's theory of language as grounded in ostensive definition, he does not elaborate on the generic role of definition within his thinking. He appears to regard definitions as at best *summarizing* ordinary language use (e.g., *PI* ¶ 162), but in any event he does not weigh their influence very heavily: "Remember that we sometimes demand

definitions for the sake not of their content, but of their form. Our requirement is an architectural one; the definition a kind of ornamental coping that supports nothing” (*PI* ¶ 217).

While allowing for definitions, he does not believe that they add anything useful to what we claim to know. That is, we do not “know” more by knowing the definition, if we already know how to use the word ordinarily:

What does it mean to know what a game is? What does it mean, to know it and not be able to say it? Is this knowledge somehow equivalent to an unformulated definition? So that if it were formulated I should be able to recognize it as the expression of my knowledge? Isn't my knowledge, my concept of the game, completely expressed in the explanations that I could give? That is, in my describing examples of various kinds of game; shewing how all sorts of other games can be constructed on the analogy of these; saying that I should scarcely include this or this among games; and so on. (*PI* ¶ 75)

The search for definitions, therefore, would appear to be at best pointless, at worst misleading. Thus, as regards our definitions in aesthetics and ethics, “anything—and nothing—is right” (*PI* ¶ 77).

Scientific Discourse vs. Ordinary Speech

Our conclusions thus far would include the following:

- ◆ The meaning of a term is completely contained in its uses in ordinary discourse. There is nothing hidden from the view of the discussants.
- ◆ Definition is derivative of meaning, and where necessary is best conceived as distilling the ordinary uses of the term at issue.
- ◆ Science, however, requires definitions that are precise, exact, and potentially divergent from ordinary use.

Science could potentially avoid this conflict by altogether avoiding the limits of ordinary language use. Neologisms would have no ordinary use outside the community of scientific readers, at least initially (an example of a one-time technical term that “escaped” to great detriment into the vernacular is the word “culture”). Could such deliberately contrived jargon (e.g., mathematical symbols, Heidegger’s “Dasein”) resolve the difficulty?

At the practical level, this approach is probably not feasible. Most scientific terms have been, and will continue to be taken from ordinary vocabulary (“religion,” “law,” etc.). But this solution, even were it feasible, encounters an even deeper conflict with Wittgenstein’s philosophy.

Language is, for Wittgenstein, a social convention based upon customs, uses, and institutions (*PI* ¶ 199). Many of the terms scientists wish to define operationally are already embedded with established patterns of use by the community of speakers. One entailment of that fact is that the terms of interest are inherently (and not merely incidentally) vague. It is that vagueness that allows use of language in nonliteral contexts such as metaphor to still be meaningful and not all akin to Carroll’s *Jabberwocky*. Ordinary terms are not constructed as Aristotelian categories with well-delineated boundaries separating one from another. Rather—and this point has been amply demonstrated by psychologists of language (see e.g. Lakoff 1987)—our concepts are structured with a “prototype” at its core, with increasingly “less good” exemplars sorted to the category’s periphery, and which eventually commingle in the fuzzy overlap with neighboring, related concepts. For example, the trout and the ape might represent the prototypes of the basic categories of “fish” and “mammal,” while the dolphin exists in the

conceptual space where these two concepts abut. Such structural vagueness is a feature that scientific terms cannot possess. Wittgenstein does suggest that boundaries can be drawn “for a special purpose,” and offers as an example the definition of 1 pace = 75 cm. (*PI* ¶ 69). He does not discuss, however, how such a boundary might actually be imposed, leaving us no clearer on the problem than we were before, which, to rephrase, is to ask how an individual scientist can assert a meaningful scientific definition, when Wittgenstein roots meaning in *agreement* among speakers concerning use of the term. Such an approach tends to make language essentially conservative (which it is), but without any identified mechanisms to introduce nonmajoritarian semantic novelty.

If the community of ordinary speakers is an inappropriate social context for science terms, perhaps the correct reference group should be the community of scientists? This solution would respect Wittgenstein’s insight that meaning follows from use, while delimiting the relevant uses to only those who would use this term scientifically. Accepting that customs and uses (i.e., the language games) are relative to the community of speakers, if we treat scientists as the relevant referent group to describe the language use, then their definitions of terms become the “ordinary.”

That solution, however, has critical weaknesses. First, the relevant scientists are not only members of that language group, but also participate in the broader one of the whole society. Wittgenstein makes a pertinent observation against this strategy when he says that “When I talk about language (words, sentences, etc.) I must speak the language of every day. Is this language somehow too coarse and material for what we want to say? *Then how is another one to be constructed?*—And how strange that we should be able to do anything at all with the one we have!” (*PI* ¶ 120). Specialists are themselves speakers

of the “every day,” and he doubts the possibility of devising a different language that is more precise than that one.

Suppose we wished to take up this challenge, though: how indeed might “another one...be constructed?” Suppose you are a graduate student much interested in defining with scientific clarity the word “religion.” How might this be done (setting aside the earlier problem of isolation of the new vocabulary from the ordinary vernacular)? Can it be done by ostensive definition (i.e., pointing)? As Wittgenstein makes clear, the answer is No: “an ostensive definition can be variously interpreted in *every* case” (*PI* ¶ 28). If I point to a (or even “the”) Catholic Church, and say, “That is what I mean by ‘religion,’” it is not clear from the pointing what I intend. Is that church (and only that church) “religion,” or is it some feature about that church that makes it “religion.” But how do I direct the viewer’s attention to *that* feature? And so on, in an infinite regress of attempted clarification. Wittgenstein does not deny that ostensive definition can be effective, but only (and this was his primary conclusion against Augustine) “when the overall role of the word in language is clear” *already* (*PI* ¶ 30). The existing boundaries of the rules governing the term’s use cut off the regressive demand for further specificity.

Perhaps a better approach would be to describe what I mean by the word, i.e., outline the necessary features of any example to qualify as a member of the category. This too must fail without in some sense presupposing knowledge of what the word means. Descriptions, like pointing, are on their face either too broad or too narrow, given that the meaning of the word implies the same meaning everywhere that it appears (i.e., the “systematicity of meaning.” While it is not clear that Wittgenstein requires this—and in fact there may be reason to think he does not—science clearly does. “Religion” having

multiple meanings, and thereby perhaps also various definitions, is precisely the situation the method seeks to eliminate.). A famous definition of “religion,” for example, is the “belief in supernatural beings.” Strictly applied, however, that would make children’s fairytales “religious,” an outcome that is usually not intended. The definition also precludes some forms of Buddhism that do not espouse a belief in deities, yet which would surely be of interest to anyone taking a survey of religions. The only way to avoid these undesirable collocation results is to invoke boundary conditions that are not included in the definition itself (i.e., by appeal to the language game in which the term is to be used, and which is already known to the definer). Such invocation, however, defeats the purpose the definition is designed to achieve: the unambiguous specification of which examples properly belong to the named category.

Unless a way can be found around these results, they leave us pessimistic about the possibility of scientific definition. Ordinary language can never be sufficiently precise to serve the needs of scientific method, nor is it possible to create an artificial community of speakers of scientific terminology or, even were that possible, to stipulate what those terms will mean in a way that would be both different from ordinary use, yet still clear to all speakers of that subcommunity. Understandability of the term appears to vary directly according to its relationship with the established ordinary use: If a term comports with that use, or is at least analogous to it, then speakers will flash on how the word is being used in any given instance. Shorn of that standard, the communicability of the term’s new meaning becomes problematic, and the feasibility of a precise scientific discourse doubtful.

An Aside

The reader may think this is all much ado about nothing. We clearly have an operable scientific method, so the problem seems to have been solved somehow. This halcyon image can be deceptive, though. Once we have eliminated the neologisms that have been introduced to name new scientific concepts (“electron,” “quark”), much of the imagined consensus evaporates. As early as 1952 Alfred Kroeber and Clyde Kluckhohn catalogued 164 definitions of “culture,” and similarly hundreds of proffered definitions of “religion” can be collected (Donovan 1994). Max Radin despaired of articulating any meaning definition of “law”: “Those of us who have learned humility have given over the attempt to define law.” Yet these are all key terms upon which established scientific projects have been built. This is not, therefore, a flaccid argument aimed at nonexistent problems with a predetermined happy resolution waiting in the wings. The possibility of doing work that incorporates “ordinary” terms in a manner that can be called “scientific” remains very much an open question.

A Way Out of the Bottle

By one reading *Philosophical Investigations* offers no opportunity for an artificial scientific language that bears no necessary relationship to ordinary speech. Scientific technical language and Wittgenstein’s philosophy of language would appear to be mutually exclusive. Either solution is imaginable: postmodernists tend to favor the emphasis on language and Wittgenstein’s maxim in the *Tractatus* that “the limits of my language mean the limits of my world” (§ 5.6), with a resulting denial of the possibility of a single truth and an objective science capable of discovering it. Empiricists tend to reverse these assumptions.

Alternatively, *PI* may be read as simply putting a limit upon what kinds of scientific definitions are possible, rather than as a bar upon scientific definitions at all. If arbitrarily divergent and idiosyncratic definitions are not possible, there may yet be a way to build upon the ordinary uses of language that will serve the needs of scientific method.

Bernard suggests, perhaps following the suggestions of Wittgenstein to a similar effect, that “most of the definitions in our present culture arise” from “inductive generalization or inference.” By examining intuitive instances of the class, we infer common characteristics and entertain them as potential defining criteria. Wittgenstein in fact observed that this is exactly how science proceeds: “The fluctuation of scientific definitions: what to-day counts as an observed concomitant of a phenomenon will tomorrow be used to define it” (*PI* ¶ 79). Thus (and in a particularly apt illustration for our discussion of scientific method) “what we call ‘measuring’ is partly determined by a certain constancy in results of measurement” (*PI* ¶ 242).

Under the method described by Bernard, one begins with an inductively generated operational definition to gather data. Based upon analyses of these data, the investigator generalizes back upon the true focus. For instance, we begin with an intuition that a “tiger” is a “big cat with stripes.” We then collect a representative sample that we are all agreed match our *idea* of tiger, and then see how well our intuition *as verbalized* describes the actual sample by subjecting the identified associations to empirical testing and quantification. The results of this process would be applied to frame a suitable definition, one that respects common usage (and which will probably present itself as either analogous to that use, or a subset of it) while offering the needed precision and stability.

As described, this procedure might invite a potential objection of tautology. Once “tiger” has been defined as a “big cat with stripes” (by whatever process), is it not circular to then study whether striped-ness is a criterion to identify tigers? Normally, yes, but a distinction must be made when *creating* a category and when *refining* a pre-existing one. Wittgenstein concedes that “Such a reform [of language] for particular purposes, an improvement in our terminology designed to prevent misunderstandings in practice, is perfectly possible” (*PI* ¶ 132), presuming, of course, that the nature of language as a social convention is respected. It is the first that *PI* shows will be problematic for science, but the second remains a viable approach. In the former it is no longer a question whether all tigers are striped, because this has already been stipulated. Any further investigation into whether the relationship holds would be bootless.

But the present case is decidedly different. We are not defining a relationship, and then “discovering” it (which would be tautological), we are first *identifying* it among the standing instances of the class based upon inductive generalization from the way the term is ordinarily used. In this example of category refinement, the stipulated definition shall relate either directly or analogously to the existing rules for use of the term.

If most tigers are found not to be striped, then in effect a new category is being created with an old label, and this should always be avoided (and Wittgenstein says this would be nonsensical in any event). “An X is Y” is consequently an hypothesis directed at a standing category, and not a rule to create a new one, and therefore investigations of the relationship are nontautological.

The method of definition outlined here is the one Wittgenstein himself offered, but perhaps overly discounted: definition as the distillation of ordinary use. Rather than

attempting to add in special and often counterintuitive features, which are precluded by the Wittgensteinian analysis, the core of the scientific definition will be the essential attributes recognized among ordinary speakers. These will be features that those speakers consistently include in their uses, although not exclusively. Scientists, on the other hand, may prefer to restrict the denotation of the term to only those central attributes. Amendments to this basic definition could be made by specification, and these identified traits may in turn be replaced by proxies (much as Wittgenstein suggests that saying “I am in pain” has taken the place of crying (*PI* ¶ 244)).

Make no mistake: this process would be neither easy nor guaranteed of success in every case. But it does offer a method by which clear definition could be articulated that would be useful to scientists while capitulating to the force of Wittgenstein’s argument that meaning cannot be corralled by stipulation alone, but instead emerges from the uses of language by fluent speakers.

Conclusions

Wittgenstein’s philosophy remains influential. If its tenets impose constraints on either the possibility of scientific definition at all, or upon the kinds that will be valid, then those limits should be recognized and to the extent possible, observed. Locating the locus of meaning in ordinary use does appear to preclude certain types of definitional strategies. Stipulative definitions of terms that have ordinary currency but which are idiosyncratic and not grounded in that common usage would appear to be most troublesome. It is not that one could not attempt such definitions (quite the contrary, they are offered at every turn), but only that their success in providing a stable and precisely delimited referential standard would be called into question. Flaunting convention in this

way would open the scientific discourse to questions about what it “means”: “I don’t know what you’re talking about, but when I talk about religion, I’m talking about something entirely different!” Beyond the philosophical, this strategy also incurs costs for science as a social enterprise: If people think they know what is being said because ordinary terms are being used, but then are told they didn’t understand the claims at all, this will have no effect so much as to reduce popular support for the project.

While neologisms provide one feasible solution to this obstacle—new terms have no history of established use, and therefore the term can be introduced and grounded in the ordinary uses of the relevant reference speech community, the specialists—many technical concepts that science wields have labels taken from common speech.

The results of this discussion have offered one possibility for resolution by basing the technical definition upon the ordinary language meaning, but with procedures that inductively extract the concept’s core and comparatively essential attributes by study of how the speech community deploys the term. The isolated associations are then framed as testable hypotheses in order to explicitly plumb the nature of the asserted association. If found to be reliable, then indeed, as Wittgenstein observed, “what to-day counts as an observed concomitant of a phenomenon will to-morrow be used to define it.”

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