

Negotiating a causal-historical theory of reference: the emergence of the 'type method' in 19th century biological taxonomy

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The Kripke-Putnam causal-historical theory of reference (Kripke, 1980; Putnam, 1975) has been strongly criticized as a general theory of reference about theoretical terms in science. Yet, as David Hull (1982) already noted, it appears that the causal-historical theory describes correctly how species names refer. For each newfound taxon, biological taxonomists lay down a 'type specimen' that carries with it the name of the taxon it belongs to. This 'type method' enables any two taxonomists to agree on the correct name of a given taxon, regardless of any disagreement they might have about what the true taxon boundaries are, and independently of future changes in taxonomic knowledge. In other words, in contemporary taxonomy a type specimen fixes the reference of a taxon without defining it.

In a fascinating article, Lorraine Daston (2004) has retraced how the type method came to be. Using a backdrop of 'epistemic virtues' and 'regimens of representation' that structure her well-known work on the history of objectivity with Peter Galison (Daston, 1999; Daston & Galison, 1992; 2007), Daston reconstructs how, in the late 19th century,

William Whewell's 'Method of Type' gradually evolved into the modern 'type method'. This process, she argues, was one of 'metaphysics in action' or 'applied metaphysics', since the taxonomist who "eventually laid down the type method for preserving the stability of names, were primarily concerned with practices, not philosophy. Yet it was precisely their gradual articulation of a set of practices (publishing, labeling, traveling, referencing, compiling) centered on a collection of objects (type specimens), that is, an art of transmission, that turned [the type method] into a remarkable act of applied metaphysics, or so I shall argue." (Daston, 2004, p. 157).

In this paper, I will argue that although Daston is right to direct attention to the 'metaphysics in action' of nineteenth century biological taxonomy, she misunderstands the nature of the metaphysics that was being negotiated. She fails to see that type method shows the causal theory at work. I will show that error has important repercussions, not only for Daston's account of the history of the type method, but also for her broader account of the history of objectivity.

The history of the type method

Daston's basic error resides in her assumption that type specimens not only function as reference-fixers of taxon names, but also serve to represent, describe and define the taxa they are part of. Starting from this false premise, Daston sets out to retrace how Whewell's 'Method of Type' (Whewell, 1840), on which type specimens did serve as representative standards of comparison for their encompassing species, evolved into the modern type method through addition of the function of name-bearing. In reality, the notion of a type specimen underwent a more radical change in meaning. 'Type specimen' lost its old connotation of a typical standard of comparison, and came to refer to a standard of reference. Today it is true that no matter how atypical a type specimen is judged to be, it can still serve its role on the modern type method. On Whewell's Method of Type, on the other hand, an 'atypical type' would have been a conceptual impossibility. By delving further into mid-19th century debates on naming in taxonomy than Daston has done, I will show this fundamental change in meaning of the type specimen came about in a surprisingly gradual process. I will show how extensive debates and

negotiations between professional and amateur taxonomists, and between those working in the peripheries versus at established museums, slowly altered what was understood by a 'type specimen'. Where in the 1840s a type specimen was still universally understood to be a specimen that was deemed typical for its taxon according to the trained taxonomist's judgment, the end of the 19th century had brought communal agreement about a type specimen being 'fixed as typical' by the first taxonomist who deemed it typical. From a philosophical vantage point, this meant that a causal theory of meaning was substituted for a descriptivist theory of meaning. The determination of 'types' no longer relied on (subjective) judgment, but on (objective, communally recognized) stipulation.

The history of 'objectivity'

Because Daston fails to understand what the type method amounts to, she also fails to see that the framework that structures her account of the history of objectivity does not apply. As soon as one realizes that the type method is a method of naming taxa, and not of representing them, it becomes clear that Daston and Galison's account of shifting 'regimens of representation' won't deliver any insight about the present case. What is more, the actual history of the type specimen shows that in an important sense Daston and Galison's framework is too narrow, since it does not take into account how objectivity about reference standards was created in the 19th century. Thus, the actual history of the type method shows that their categories of 'mechanical objectivity' and 'structural objectivity' leave an important aspect of the history of objectivity unaccounted for.

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