

Description, Demonstration, Novelty, and Truth: Hudson's Criteria for Precise Attribution of Discovery

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Asserting that discoveries are not attributable to an individual and to a moment in time, Kuhn in *The Structure of Scientific Revolutions* argues that discovery has been misconstrued as a “single simple act assimilable to our usual concept of seeing”¹. He suggests discovery is a process that occurs only when “all the relevant conceptual categories [of the object of discovery] are prepared in advance” so that it can be proved that the object does in fact exist and what it is.² However Roger D. Hudson, author of *Discoveries, When and By Whom?* argues that it is unnecessary for *all* conceptual categories to be prepared, but rather that if the discoverer can meet a set of criteria, the discovery can be accepted.³ By providing a basic description of the object of discovery and a means of materially demonstrating its existence—in context of the description—Hudson asserts that discovery can be given a precise attribution. In addition, the discovery must be one of novelty and the material demonstration must actually demonstrate the existence of the object that is described in the basic description.⁴ Both Kuhn and Hudson use the discovery of the oxygen to illustrate their perspective on the issue.

Kuhn's foundation for scientific discovery lies in paradigms (scientific models of data and theory that outline predictions for experimental science) and anomalies (occurrences that violate the predictions provided by paradigms).⁵ Describing the

¹ Kuhn, Thomas S., *The Structure of Scientific Revolutions*, p.55

² Kuhn, pp. 55-56

³ Hudson, Robert G., *Discoveries, When and By Whom?*, British Journal for the Philosophy of Science; March 2001, Vol. 52 Issue 1, p. 77

⁴ Hudson, p. 79

⁵ Kuhn, pp. 52-53

commencement of discoveries as recognizing an anomaly, Kuhn states that discovery continues with “extended exploration of the area of anomaly” and ends only when the paradigm has been revised so that “the anomalous has become the expected.”⁶ As aforementioned, Kuhn argues that a complete and correct conceptualization of the object of the discovery is also necessary. Kuhn’s requirement for conceptualization is the main point on which he and Hudson disagree. This will be further discussed in the context of the discovery of oxygen. However, first there will be discussion of Hudson’s criteria for discovery.

Emphasizing that complete and correct conceptualization is not necessary, Hudson states that the discoverer need only have some true views about the object. According to Hudson, the discoverer, with a conception that contains some true views, and possibly some false, can create what he calls a base description. The base description is a conceptualization that “suffices to identify...the object being considered.”⁷ For example, a base description for McDonald’s could be the place with golden arches that sells hamburgers. However, an important question arises with this criterion: how much detail and truth is necessary for a base description to be considered valid?

Hudson answers this question by arguing that discoverer needs to have enough conceptual resources to recognize its presence in a fairly reliable manner.⁸ In addition, the relevance of the details and truths in the description of the object become much more important in the next step—demonstration. Dependent on the validity of the base description, Hudson’s next criterion is material demonstration. Both Kuhn and Hudson agree that this step is necessary. Hudson calls the material demonstration “rather

⁶ Kuhn, p. 53

⁷ Hudson, p. 77

⁸ Hudson, pp. 78-79

rudimentary” in that it is very difficult—if not impossible—to think of a case in which a discovery has been made with demonstrating the object of discovery.⁹ In this step, the base description plays a crucial role. If the base description is faulty, the discoverer will not be able to materially demonstrate the object being considered. That is why there must be enough truth and detail in the discoverer’s conceptualization as to avoid creating a description for an object that cannot be materially demonstrated. This process of demonstration will be further explored in the case of the discovery of oxygen.

Perhaps the simplest of the criteria are the novelty and truth conditions. The According to Hudson, the novelty condition states that a discovery can be defeated if it can be proved that the object had been found by means of prior discovery.¹⁰ Hudson makes an important point that novelty is socially dependent. He asserts that “there is not such a thing as novelty, in itself;” therefore, the discovery must be novel in the context of the “‘ambient’ social group”—the group in which the discovery is being made.¹¹ As for the truth condition, Hudson reiterates the first two criteria by stating that what is produced from the material demonstration must in fact be what was conceptualized in the base description.

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By using Hudson’s criteria for discovery, it is possible to assign a more precise attribution than Kuhn allows. However, there are still issues that arise from Hudson’s criteria. First, Hudson’s notion of an “ambient social group” is not well defined. How

⁹ Hudson, p. 80

¹⁰ Hudson, p. 80

¹¹ Hudson, p. 81

large or small must the social group be in order for the novelty condition to be satisfied? These are questions that Hudson does not directly answer. Secondly, discoverers tend not to write “base descriptions” when engaging in scientific activity. Therefore, their initial conceptualization of the object is vulnerable to change. Lastly, and quite important to consider when comparing the two perspectives, Hudson never mentions the limitations set by Kuhn’s paradigmatic models. That is to say that “Hudsonian” discovery does not necessarily violate the expectations of some predetermined scientific model, whereas it is in the definition of a “Kuhnian” discovery that an anomaly must be present for discovery to occur. Despite these issues and unanswered questions, Hudson’s claim of precise attribution can not be overlooked. Although his criteria may not be fully developed, he provides standards for the process of discovery that can be scientifically validated.