The Ups and Downs of Newton's Rule 3: A Case Study in the Evolution of Philosophical Concepts

By: Zvi Biener

In the last sixty year, Rule 3 has been the most discussed of Newton's Regulae Philosophandi. But it was barely noticed when initially published and mostly ignored by 18th- and 19th-century commentators. Why did its fortunes change? And what was its import for Newton himself? I use a detailed discussion of Rule 3's content and origins as a case study for the evolution of philosophical concepts and what I call "philosophical centers of attention."

Rule 3 first appeared in the Principia's second edition (1713), where it replaced the first edition's (1687) Hypothesis 3, an alchemically-tinged claim about the transmutation of all bodies into one another. Yet Rule 3 does not mention transmutation. Rather, it focuses on the invariable, universal qualities of matter. The language of 'universality' has caused historians some consternation. I. B. Cohen suggested that Newton abandoned Hypothesis 3 because it was too vulnerable to criticism by supporters of alternate matter theories. Ernan Mcmullin suggested that Newton came to realize that Hypothesis 3 conflicted with atomism, since it allowed even mechanical qualities like impenetrability to be transmuted. J. E. McGuire defended the compatibility of Hypothesis 3 with atomism, but held that Newton didn't want to defend his atomism publicly. McGuire also suggested that Newton abandoned Hypothesis 3 because he adopted Locke's primary/secondary distinction. The latter claim has been especially influential.

But the origins of Rule 3 betray a simpler story. In this talk, I first present a play-by-play reconstruction of the immediate events that lead to Newton's formulation of Rule 3 in the winter and spring of 1690. I argue that the Rule's genesis shows that Newton's direct concern was not tempering transmutation or promoting a Lockean epistemology. Rather, he was responding to a few key passages in Huygens's Discours de la cause de la pensanteur (1690). Placing Rule 3 in this context explains some of its most curious features, such as the seemingly out-of-context discussion of the experimentum crucis and Newton's odd claim (after stressing how certain we are of the impenetrability of bodies) that "the argument from phenomena will be even stronger for universal gravity than for the impenetrability of bodies."

Rule 3's origin in Huygens's Discours also sheds light on Newton's concept of universality. This concept has also been the subject of some debate, since Newton went out of his way (disingenuously, according to some) to assert that gravity's universality did not entail that gravity was an essential property of matter. Examining the Rule's origin, as well as offering a more thorough study of Newton's use of adjectival and adverbial forms of universus in the Principia, I show that "universality" was a much more deflationary concept. It's proper home was within discussion of simple induction from instances, and it was meant to indicate nothing more than the applicability of the "universal" predicate to all members of a certain class, even if that class was highly restricted. I show that Newton's contemporaries (like Pemberton) read the rule this way. I also show that Newton's universal qualities did not mean primary qualities, as some recent commentators have argued. Issues of primacy were besides the point.
There are two morals to take from this story. First, these considerations, taken together, show that Newton didn't approach the Principia with a coherent, worked-out philosophical position already in mind. Rather, he articulated that position after the Principia was first published, in response to a series of contingent events. Second, they show that what Newton considered to be the philosophical import of

Rule 3 is not what his 20th-century commentators thought its import was. Why the difference of opinion? I sketch out some of the reasons our “philosophical attention” has shifted from one reading of the rule to another, and why — not surprisingly — there is no univocal interpretation of the Rule’s meaning. Also not surprisingly, these reasons involve Hume’s account of induction, as well as the subsequent history of gravitational research.