Review of: "Objectivity and Honesty in Science: The case of Light Interference Phenomena"

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Potential competing interests: No potential competing interests to declare.

Carole Nahum's case study of Thomas Young's and Augustin Fresnel's protracted effort to win support within the scientific community for their theory of light interference phenomena exposes the importance of human relationships in both the advancement and the arresting of scientific progress. As network analysis has demonstrated, many scientific findings do not gain acceptance because they are the product of rigorous experimentation and replication. They instead earn acceptance by being promulgated by scientists who have reputational authority. In short, scientific findings become, to use Thomas Kuhn's language in *The Structure of Scientific Revolutions*, "paradigmatic" not through objective testing and re-testing, but through conversations among scientists. Such conversations often follow familiar channels. Those who wish to explode the banks and let new ideas rush in are often dismissed or even ostracized. The consequence is, as Max Planck put it so mordantly, "Science advances one funeral at a time."

This understanding that science was not only shaped by the subjective but could profit from acknowledging the subjective's contributions to scientific inquiry was extant at the time that Young and Fresnel were advocating for their theory. While, as Andrea Wulf observes in *Magnificent Rebels: The First Romantics and the Invention of the Self*, "from the late seventeenth century onwards, the scientific community had tried to strip anything subjective, irrational, and emotional from their disciplines and methods," the German Romantics, in particular Novalis, argued that "measurements, scientific data, experiments, and classifications couldn't provide the answers for everything." Novalis and the other members of what Wulf calls "the Jena set" argued that "The sciences must all be poeticized." Only a synthesis among the poetical, the philosophical, and the scientific could afford a full understanding of the natural and physical worlds. Perhaps Emily Dickinson captured Novalis's aim best when she wrote

"Faith" is a fine invention

When Gentlemen can *see*-

But *Microscopes* are prudent

In an Emergency

Nahum's contribution is not that she reveals elements of the scientific enterprise that had been hitherto cloaked. The so-called "replication crisis" that has tarnished so many scientific disciplines recently has prompted even those who were the staunchest defenders of science as value neutral to backpedal. Case studies such as the one Nahum so

carefully crafts and presents here, however, do offer confirmation that no scientific theory or finding is uninfluenced by its discoverer's or architect's characteristics or the nature of the scientific community with which they must contend. As Robert Heilbroner wrote many years ago in *The Worldly Philosophers*, all important ideas bear "the stamp of their originators."