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Murphy, Kieran M. *Electromagnetism and the Metonymic Imagination*. University Park, Pennsylvania: The Pennsylvania State University Press, 2020. 192 pp. ISBN: 978-0-271-08605-7.

Oersted's experiments in 1820 revealed the fundamental connection between electricity and magnetism, paving the way to Faraday's field theory and Maxwell's equations. This connection and its effects on Western literature and culture represent the core topics of Kieran Murphy's book, one of the latest publications of the "AnthropoScene" series, published in collaboration with the Society for Literature, Science, and the Arts (SLSA). Murphy's approach takes a step further from the technological advancements to focus specifically on the analysis of the imagery born in the background of this scientific epistemological shift. His claim is that "[w]hereas electric imagery tended to emphasize metaphorical relations founded on resemblance, electromagnetic imagery underscored metonymic relations based on contiguity."¹ His method draws extensively on two main concepts: through Michel Serres' idea of "transformational motors," i.e. engines that incarnate the possibility of creation from difference, electromagnetism is tied to John Tresch's theory of "Romantic machines" which "embodied prominent ideas of Romanticism: organicism, metamorphosis, and the unity of natural forces, reason and imagination, and mind and nature."²

The resulting link between science and culture is explored in the literature of three authors, read through the imagery resulting from three apparatuses – the electromagnetic chain, electromagnetic induction, and the automaton – one for each author, respectively. The idea of metonymy

¹ Kieran M. Murphy, *Electromagnetism and the Metonymic Imagination* (University Park, Pennsylvania: The Pennsylvania State University Press, 2020), 5.

² Murphy, *Electromagnetism*, 20.

which stems from them is not that of a simple figure of speech, but of a mode of investigation that exalts adjacency as a valuable means of interdependence. The first chapter develops a reading of Poe's "The Spectacles" (1844) and expands it to others of his short stories. The second starts from Balzac's second edition of *Louis Lambert* (1833), and refers to a variant of the text to claim that "Balzac was the first major literary figure to jump in the same Faradayan 'wave' that guided Einstein when he discovered the theory of relativity."³ The third chapter makes a chronological leap to Villiers de l'Isle-Adam's *L'Éve future* (1878-86), a story about the creation of a robot woman, to show the survival of the new metonymic epistemology throughout the nineteenth century: up to the birth of modern psychology. Finally, the conclusion shifts to the twentieth-century scientific developments, from the point of view of literary critique, providing an electromagnetic reading of the work of Bachelard, as well as of Julien Gracq's interpretation of André Breton. The choice of authors, well within the Western canon, reflects part of Murphy's expertise (especially on French literature), while his other main field of research, namely Haitian literature and culture, remains out of range for this specific topic.⁴

Despite the seemingly compartmentalised structure, Murphy's approach is genuinely comparative: the final impression is that of a tight-knit set of correlations between the authors, and between them and the epistemological visions deriving from scientific advancement. The focus on imagery, and on the underlying common imagination from which it is born, is informed by an approach that seems especially inspired by the work of Linda Dalrymple Henderson (who also appears in the acknowledgments), whose investigation on art and science relies

³ *Ibid.*, 55.

⁴ On this last strand of his research, see Kieran M. Murphy, "White Zombie," *Contemporary French and Francophone Studies* 15, no. 1 (January 2011): 47-55; Kieran M. Murphy, "The Occult Atlantic: Franklin, Mesmer, and the Haitian Roots of Modernity," in *The Haitian Revolution and the Early United States Histories, Textualities, Geographies*, eds. Elizabeth Maddock Dillon and Michael J. Drexler (Philadelphia: University of Pennsylvania Press, 2016), 145-61; Kieran M. Murphy, "Haiti and the Black Box of Romanticism," *Studies in Romanticism* 56, no. 1 (2017): 37-54.

on a great deal of visual material.⁵ Far from being mere appendixes, the eleven images shown in the book (of which I cannot fail to mention the high graphic quality) guide the analysis, tracing the permanence and transience of concepts in a *long durée* that relates, for example, Plato's *Ion* to Maxwell's graphs through the idea of the great chain of being. Thus, literature and science are inserted in a flux of world-visions that periodically return, reinterpreted in light of epistemologies that renew with any new scientific or philosophical interpretation of reality.

In spite of these themes revealing an incredible series of interconnections, the book is traversed by a *fil rouge* that strongly limits the topics taken into consideration: mesmerism is omnipresent in the interpretation of the texts, up to the point that one is led to ask oneself why no reference to it appears in the title. Murphy endeavours to prove that, from Oersted's discovery on, Mesmer's theory of "animal magnetism" became entangled with the latest findings of physics. He calls the renewed philosophy "animal electromagnetism"⁶ and focuses on how its metonymic power can bring together the very different forces that influence the world: Poe's *Eureka: A Prose Poem* is an example.⁷ While this furnishes a perfect middle ground on which literature and science can profitably encounter, the preponderance of the mesmeric topic (in several cases the main theme of the works under scrutiny) sometimes blurs the picture, leaving the reader in doubt of the role of official physics in the tangle of ideas and beliefs behind the texts.

Nonetheless, Murphy's work does not fail to engage with compelling ideas that hold the seeds for radical reinterpretations of some of the main works of Western literature. For example, the proposed association between mental and physical induction, informed by the affiliation between mesmerism and electromagnetism, sheds new light over nineteenth-century ideas of the structure of the world, and of the ways to discover its secrets. By incorporating the newfound links into precedent theories, such as Charles Rzepka's "metonymic induction,"

⁵ See, as an example, Linda Dalrymple Henderson, *The Fourth Dimension and Non-Euclidian Geometry in Modern Art*, rev. ed. (Cambridge, Massachusetts: The MIT Press, 2012).

⁶ Murphy, *Electromagnetism*, 22.

⁷ *Ibid.*, 36.

Murphy presents an improved definition of notions like contiguity and intuition to better clarify both the trickery behind Poe's short stories and the origins of detective fiction, in the person of Poe's character, Monsieur Dupin.⁸ In a similar way, Balzac's interest in Mesmer's and Faraday's theories is shown to instruct not only his style, but the very method of investigation behind the *comédie humaine*.⁹ In both cases, the reference to the visual elements of the analysed apparatuses seems to reach the core of the relation between science and imagination, with complex views (such as the common role of the electromagnetic field and the body in human reasoning) obtaining a visual counterpart that can be applied to the texts' exegesis. Overall, this approach seems stronger than those which concentrate mainly on the language-driven side of literature and science, often suffering from the differences between the two discourses, which bring uncertainties in the delimitation of a common ground. In particular, the method works very well when it comes to those theories in physics that relate to space and the invisible forces that modify it, for which the mathematical counterpart needs some means of visualisation. Of course, metaphors, analogies, and other rhetorical means remain fundamental tiles of the mosaic, but the outcome is undeniably more nuanced.

While the literary part of the analysis strikes for its ingenuity, problems arise when the research shifts to the scientific or philosophical derivations of electromagnetism. Regarding the link between Einstein and Balzac on electromagnetic induction,¹⁰ Murphy's enthusiasm leads him to highlight the importance of Faraday's law for the development of special relativity. While this claim is nothing new, being clearly stated in Einstein's famous 1905 paper "On the Electrodynamics of Moving Bodies," the manner of its exposition downplays other fundamental precedents that might have led to the theory (such as the Michelson-Morley experiment on the speed of light in the ether on the one hand, and the influence of Mach's philosophy on the other). The quotation of a later interview released for the general public,¹¹ on

⁸ *Ibid.*, 48-52.

⁹ *Ibid.*, 70-75.

¹⁰ *Ibid.*, 75-80.

¹¹ *Ibid.*, 79, n. 76.

which Murphy returns more than once to prove that general relativity arose from the metonymic connection between the electromagnetic and the gravitational field, seems far from overwhelming evidence for something that, in fact, is no mystery, viz. that Einstein's theories stood on the latest advancements of classical physics. Moreover, since Murphy's reflection touches upon some very complex concepts of physics, a deeper inspection of the science behind it would have probably helped his case: quoting the mathematician Thomas K. Simpson at the beginning of his book, Murphy had defined Maxwell's diagrams as "figures of thought,"¹² but now he seems to undermine the same potential bore by Einstein's space-time geometry.

A similar case can be made for the conclusion. For example, the part on Bachelard's "psychic induction" in literature¹³ strikes for its pertinence, even more so when one considers the chronological distance between him and the previous authors. However, in the section before, on the ideas of scientific "epistemological break" and "transcendental induction,"¹⁴ Murphy finds a very interesting intertextual relation between Bachelard and the nineteenth-century theologian Joseph Gratry, but still limits the picture to electromagnetism and relativity as deriving from it, thus devaluing the pivotal role that Bachelard assigns to other notions such as non-Euclidian geometry, axiomatic systems, and quantum theories.¹⁵

In spite of these, indeed few, shortcomings, Murphy's book is a solid account of fundamental concepts of the nineteenth and twentieth centuries, and represents a useful addition to the field of literature and science both in terms of sheer data and of comparative methodology. In fact, the prominence given to the explanation not only of the cultural environment in which the theories found their inception, but also to the theories themselves (which might result a little excessive for researchers of the area), makes it an accessible reading for any scholar interested in the topics or in the analysed authors. It also leaves the reader with

¹² *Ibid.*, 13.

¹³ *Ibid.*, 124-26.

¹⁴ *Ibid.*, 121-24.

¹⁵ See especially Gaston Bachelard, *Le nouvel esprit scientifique* (Paris: Presses Universitaires de France, 1934).

a strong desire for future implements to the research: what happens in the cases in which electromagnetism and metonymy have no bond with mesmerism? How much did Balzac contribute to the diffusion of electromagnetic imagery, considering his coeval reception in Western literature? What other authors can be explored through this lens? These and many other questions come to mind, showing the potential fertility of the investigation pioneered by Murphy.