trends of the post-war generation within an atmosphere in which the biological basis of mental disease was an ever-present preoccupation.

This preoccupation with mental illness and its biological roots led McCulloch both to the Illinois Neuropsychiatric Institute, his institutional home for the next decade, and to his collaboration with the mathematical wunderkind Walter Pitts. The pair's most enduring product, the 1943 paper 'A logical calculus of the ideas immanent in nervous activity', laid much of the groundwork for the modern concept of the neural network, as well as artificial intelligence and cognitive psychology. Yet despite its seeming modernity, Abraham demonstrates how the Pitts–McCulloch theory was itself the product of earlier practices of pre-war neurophysiology, and her deft handling of the somewhat obscure technical details of such practices as strychnine-based brain localization is impressive. At the same time, McCulloch began his association with the emerging cybernetics movement, and Abraham is at her strongest in her analysis of McCulloch's role as the intellectual ringleader of the Macy conferences. Abraham demonstrates both how important neurophysiology was for the emerging field of cybernetics (a point often lost in histories that have focused on Wiener), and how McCulloch's interdisciplinary rhetoric served as a cover for a more imperial aspiration to transcend the different biological and social sciences through the tools of mathematical modelling. Abraham's analysis of the early Macy meetings is perceptive, and she uses archival documents judiciously to demonstrate discord behind the scenes.

By the early 1950s, McCulloch had transitioned to a new institutional setting, the Research Laboratory of Electronics at MIT. This move enabled two additional reformulations of his scientific identity: first from neuropsychiatrist to engineer, and second from upstart scientific evangelist to the 'rebel genius' of the title, an enigmatic sage of the information age, remembered fondly by his students and collaborators for his egalitarian mentorship, his unkempt white beard, and his habit of subsisting for days on a diet of ice cream and whiskey. Yet beyond McCulloch's self-presentation lay a mode of theorizing in biology that was richly generative for the emerging fields of artificial intelligence and cognitive psychology. For McCulloch, mathematical theorizing was less a way of representing nature than a way of intervening in scientific practice – a legacy of his transdisciplinary life in science.

*Rebel Genius*, which grew out of Abraham's dissertation research on the history of mathematical biology, is an excellent example of the continued value of scholarly biography. Throughout, she uses the theoretical contributions of such scholars as Mario Biagioli and Judith Butler to keep an eye on McCulloch's self-fashioning of his scientific identity. These ideas are used with a light touch, and indeed, as a reader, I often wondered whether their invocation was entirely necessary; Abraham's presentation of McCulloch seemed compelling enough on its own. By contrast, her fine-grained look at the rhetoric and reality of interdisciplinarity should make her book a model for those interested in the explosion of hybrid scientific fields in the post-war world. Moreover, at a breezy 189 pages of text, *Rebel Genius* is an exemplar of concise scholarly prose. It should receive a wide readership, from those interested not only in the history of cybernetics, but also in twentieth-century science, interdisciplinarity and the brain and mind sciences more generally.

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J. David Archibald, **Origins of Darwin's Evolution: Solving the Species Puzzle through Time and Place**. New York and Chichester: Columbia University Press, 2017. Pp. xii + 192. ISBN 978-0-231-17684-2. £54.95 (hardcover).
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Popular misconceptions of Charles Darwin were in no way allayed by last year's publication of A.N. Wilson's *Charles Darwin: Victorian Mythmaker*. For Wilson, Darwin was a merciless

careerist who drew upon the ideas of others without giving due credit to his theory's origins. Moreover, the creationist echoes of Richard Weikart's *From Darwin to Hitler* abound in Wilson's own portrayal of one of the nineteenth century's most beguiling figures. We could be forgiven for thinking, after delving deep into Wilson's world, that Darwin was a conceited, flatulent plagiarist responsible for an idea that led to the Nazi's continent-wide eugenics programme. Into such a 'revisionary' milieu of Darwin, the publication in the same year of J. David Archibald's *Origins of Darwin's Evolution: Solving the Species Puzzle through Time and Place* has appeared as a welcome breath of epistemic fresh air. Drawing upon a wealth of his protagonist's personal correspondence and published material, Archibald takes seriously Darwin's reciprocal engagement with his collaborators and critics to establish the evidential case for the evolution of species.

*The Origins of Darwin's Evolution* gravitates around two pivotal arguments: the first, to establish historical biogeography – the study of the history of a species through the interpretive analysis of the geographical distribution of organisms across time – as the earliest important proof of evolution by means of natural selection; the second, to argue Darwin's place among the ranks of the pioneering biogeographers of the nineteenth century, such as Alfred Russel Wallace and Joseph Hooker. To what extent does Archibald succeed at both in this book? The first point is the strongest made, yet the second leaves open questions for further investigation. Concerning the first argument, Archibald's overarching contribution does not lie within the novelty of its minutiae but rather constitutes a perceptive synthesis of current research. His historiographical foundations are clearly outlined in the preface and introductory chapter. Building upon the excellent scholarship of John van Wyhe (particularly the *Darwin Online* project), Gordon Chancellor, Frank Egerton, Niles Eldredge and Janet Browne, Archibald argues that even the discerning reader of *The Origin of Species* may overlook the importance of the four chapters Darwin dedicated to the geographical distribution of species across time and place. By overlooking the importance of these chapters, Archibald claims that it is unsurprising that reviewers may have missed the significance that historical biogeography had on Darwin's own intellectual development and early proof of evolution.

The first half of the book addresses the problematic task facing Darwin to establish an evidential basis for the mutability of species based upon geological and fossil records. The first problem we are introduced to is the lack of evidence in the fossil record to account for the mechanisms of evolution. This is due to missing gaps in the record to account for transitory links between species across time. Yet Darwin did not perceive the gaps in the fossil record to be a grave indictment of evolution, arguing that the fossil record revealed only a fragmentary history of life, not its totality. The greater problem for Darwin would lie in the field of geology and the marking of time in Earth history. We are presented in the early chapters with Darwin's exposure to geology at Cambridge by Adam Sedgwick and John Stevens Henslow, some thirty years before the publication of *The Origin of Species*. The importance of Darwin's exposure to geology, particularly his reading of the geology of Charles Lyell when aboard HMS *Beagle*, played a remarkable role in influencing the young naturalist's understanding of earth history. As Archibald discusses in a later chapter, the problem of marking the age of the Earth stood as one of the greatest challenges to the evidential case for evolution. Darwin was conscious of the great stretches of time needed to accommodate the gradual change of species via natural selection. As such he drew upon the work of Lyell and James Hutton to argue for an almost limitless earth history to accommodate the process of evolution. Yet Archibald makes clear that time was not on Darwin's side. Finding proof in the geological record for the vast lengths of time necessary for the process of evolution made for the greatest challenge that Darwin would never resolve during his own lifetime.

The first half of the book culminates in a succession of short contextual biographies of the 'immutablists' – a term coined by Archibald to describe the list of geologists and palaeontologists Darwin identified in Chapter 9 of *The Origin of Species* as the principal antagonists to evolution.

The immutablists, as the name suggests, held to the 'immutability' of species based on the deficiencies in the geological and fossil records to account for evolution. It was the attempt to win over immutablists, most prominently Charles Lyell, that led to the development of Darwin's use of historical biogeography to provide an evidential account for evolution.

The second half of the book is dedicated to Darwin's attempts to discover long-dead species and relate them to the recently living by charting an interpretive history of the distribution of these species across time and space. Archibald focuses these later chapters on the separate observations of distinct faunal successions in the geological record, closely related fossil species on the same continent, and the recent diversification of species on isolated oceanic islands as Darwin's biogeographic proofs. He argues that taken together as a whole they allowed Darwin to claim that the mechanism of natural selection explains the great disparity and distribution of varying species across the Earth. It was Darwin's interpretive observation of the distribution of plants and animals across greatly differing geographies that Archibald argues is the historical biogeographic proof of evolution by means of natural selection.

To what extent was Darwin one of the great biogeographers of the nineteenth century? Archibald's case for this point is not explicitly made. He is clear that historical biogeography would only come to be identified as a discipline after Darwin's death. Yet a comparative history of Darwin's contribution to this burgeoning field with Alfred Russel Wallace and Joseph Hooker is missing from this book and would have strengthened Archibald's argument to place Darwin in the pantheon of the great nineteenth-century biogeographers. Nonetheless, *Origins of Darwin's Evolution* offers a comprehensive, well-written and accessible account of a relatively underexplored history of what Darwin believed to be the earliest major proof of evolution. The great strength of this book lies in bringing to life Darwin's relationship with a cast of historical characters, his own intellectual development and the observations that first lit the thought of evolution and the search to solve the species puzzle.

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Tania Anne Woloshyn, **Soaking Up the Rays: Light Therapy and Visual Culture in Britain, c.1890–1940**. Manchester: Manchester University Press, 2017. Pp. viii + 273. ISBN 978-1-7849-9512-6. £45.00 (hardcover).
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Woloshyn offers an account of the visual culture of light therapy in Britain from its earliest modern developments in the 1890s to its deeply embedded medical and public presence by the 1930s. Her study is a significant addition to the somewhat limited body of literature on the British history of light therapy, and a valuable contribution to existing scholarship on visual and material cultures in histories of science and medicine (such as Carter's *Rise and Shine: Sunlight, Technology and Health* (2007), Jamieson's 'More than meets the eye: revealing the therapeutic potential of light, 1896–1910', *Social History of Medicine* (2013) 26(4), pp. 715–737). The account centres on the role of images in the emergence and legitimization of light therapy, and draws on a rich variety of visual material, including before-and-after photographs of patients, documentary photographs of light clinics, advertisements and documentation, including charts, graphs and X-rays. Although these images are considered by Woloshyn as evidence of how light was conceptualized to act upon the body and viewed as actively contributing to definitions of light as a method of cure, the capriciousness and non-conformity of these images are also thought to communicate and contribute to medical practitioners' ambivalent and competing perceptions of light therapy's benefits and risks.

The chapters of the book are each driven by an image, or a set of images and objects, used to lead a discussion on a specific theme in light therapy's history. The account begins with a supplement