

RICHARD G. OLSON, *Science and Scientism in Nineteenth-Century Europe*. Urbana and Chicago: University of Illinois Press, 2008. Pp. 349. ISBN 978-0-252-07433-2. £14.99 (paperback). doi:10.1017/S0007087409990343

In his defence of the idea of freedom in the 1900s, G. K. Chesterton was one of the first to attack 'scientism'. Indeed, he claimed that it was reading the works of Huxley and Spencer which had led him to theology, appalled at the determinism which he thought they implied. The first usage of 'scientism' came in 1877 and signified nothing worse than the 'habit and mode of expression of a man of science'. However, by the twentieth century the term had taken on its derogatory meaning. In 1942 Hayek called it 'that slavish imitation of the method and language of science', and this connotation of an inappropriate, and even superstitious, extension of scientific method has crystallized the meaning of 'scientism' ever since. The idea of scientism, therefore, raises the question of the proper purview for science and, as such, can be an important tool for exploring the historical relations of science and society. It is with this in mind that Richard G. Olson begins his investigation of scientism in the nineteenth century.

The book is structured in four parts. The first deals with the effects of the French Revolution on science and medicine. The second is on science and culture in Germany and Britain, and includes discussion of Marx, who, we are told, was able to wrest control of the working-class movement from the anarchists because of the scientific nature of his social investigations. The third part deals at length with the theory of evolution and includes chapters on both the origins and legacies of Darwinism. The geological debates which informed the young Darwin are described succinctly, ahead of an account of the progress of 'social Darwinism' in Britain and France. As the century draws to a close the narrative gathers pace, with a survey of Wallace, Huxley, Kidd, Bellamy, Haeckel and others. The fourth and final part turns to the negative outcomes of evolution in the discourse of degeneration, as found in the works of Nordau, Morel and Zola.

It is notoriously difficult to produce a general book which tackles grand themes in history. The task requires, on the one hand, sufficient depth and novelty to satisfy the expert and, on the other, the fluency to carry along the general reader. Furthermore, these two goals are often in tension; to serve them simultaneously requires a high degree of judgement in the selection of material, as well as a clear grasp of what is and is not germane to the argument. The trend towards ever more narrowly focused monographs makes the appearance of an ambitious work of such wide scope highly welcome. Olson is the author of many books in the history of science, and this book can be seen to emerge from a long-standing interest in bridging the 'two cultures' by providing students of the sciences with a grounding in the humanities. As such, it will stimulate interdisciplinary American undergraduates, who will find certain chapters (such as the one on Saint-Simon) useful introductions to their topics. The test for a wider and more critical readership will be whether this brave book is able to enlighten, clarify and synthesize its material convincingly.

Although Olson's book provides a sense of the grand sweep of ideas, its wide range comes at a price. The difficulty surrounding the valence of the central term, 'scientism', is never resolved, and since none of Olson's protagonists actually use the word themselves, there can be no attempt to establish its contemporary meaning. By ending his study in the 1890s, Olson has excluded the very time when his central term came into usage and, as such, this book can be only a pre-history of scientism. What is more, the book would perhaps also have benefited from a clearer distinction between those who *prescribed* a scientific approach to tackling social problems (the scientific utopians) and those who used scientific concepts to analogize and *describe* them. For example, unlike the utopians, Darwin did not advocate placing society in the hands of a scientific expert class; rather, the theory of evolution encouraged a set of claims to be made about the existing social order.

Further difficulties become apparent in the first chapter when, for example, the controversial claim that Jean-Baptiste Say was the first to argue for the importance of science in industrial

production (p. 32) is not supported with an original date of publication. Readers attempting to ascertain the source of the claim will be disappointed to find no bibliography and, more generally, it quickly becomes apparent that the majority of the sources have been cited at second hand or in translation. Punctilious readers will be disturbed by the number of erroneously rendered foreign words and the inconsistent formatting of the text. The use of 'Artze' instead of 'Ärzte' and the misspelling of Alfred Russel Wallace on all but one of the occasions he is mentioned are only two of many errors. Other readers may be surprised to learn that in his philosophizing Comte came closer to rivalling Aristotle than 'any intervening thinker', and that the 1860 Huxley–Wilberforce debate at the BAAS took place in Cambridge rather than Oxford, while the description of Haeckel as a 'rabid German cultural nationalist' is not particularly helpful in a study of European history.

Science and Scientism in Nineteenth-Century Europe will be of use to scholars unfamiliar with the topic, but only insofar as they are unable to consult the existing secondary literature for themselves. Taken as a whole, its story contains such a distractingly large cast of characters that, unfortunately, many readers may not be carried to the end. This is a shame, since the author has provided a refreshing work of ambitious scope, whose central claim about the nineteenth century – that it witnessed a huge expansion in the applications of scientific thought – should be our point of departure if we are to make sense of the fear of 'scientism' expressed by Chesterton and others in the twentieth century.

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RICHARD STALEY, *Einstein's Generation: The Origin of the Relativity Revolution*. Chicago and London: University of Chicago Press, 2009. Pp. x+494. ISBN 978-0-226-77057-4. £26.00 (paperback).
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This book is the antihistory of relativity. Just as in our peculiarly matter-based universe it is easy to miss the existence of antimatter, we have become so comfortable with the conventional history of relativity that it is easy to miss the rest of the story. Richard Staley's *Einstein's Generation* seeks to uncover the forgotten contexts of the traditional milestones to modern physics, and to confront those milestones on their own terms, thus showing them in a new light.

The book begins with the experiments that still launch a thousand anachronistic textbook sidebars: the Michelson–Morley ether-drift measurements. Staley argues that instead of focusing on the significance of the experiments for relativity (i.e. was Einstein influenced by them or not), we should try to recover Michelson's own experimental logic. We are given a detailed and fascinating account of the material culture and institutional manoeuvring behind the development of the interferometer, with the astronomer Simon Newcomb's behind-the-scenes influence emerging as especially interesting. Staley is persuasive in arguing that Michelson's experimental programme was intensely focused on the development of the instrument itself, and that the ether-drift experiments were ancillary. This examination of the material culture of relativity is extended to Walter Kaufmann's electron experiments, providing one of the first close studies of these.

These narratives help the book develop the argument that the emergence of relativity was dependent on much more than just conceptual advances, and needed to draw on both material resources and a particular disciplinary alignment. In a sense, this is a discussion of how Einstein was produced (thus the title's pun) by the changes in turn-of-the-century physics, in contrast to the usual picture of Einstein driving those changes. Staley shows that what we take to be the achievements of Einstein and 'modern physics' was far from inevitable, but instead quite contingent on various events.