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REVIEW

Natural Selection & Beyond: The Intellectual Legacy of Alfred Russel Wallace

edited by Charles H Smith and George Beccaloni
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reviewed by Sherrie Lyons

Like many other scientists in Darwin's circle such as Thomas Huxley and Charles Lyell, Alfred Russel Wallace has been somewhat in Darwin's shadow, in spite of his independent discovery of the principle of natural selection. Historians of science have been drawing attention to the contributions of these men, and in the last ten years several good biographies have come out on Wallace. Nevertheless, this collection of essays is a valuable and welcome addition, elucidating the many different facets of this complicated and talented man. As Peter Bowler mentions in his foreword, Wallace made major contributions to evolutionary theory, extending its application to various areas such as the geographical distribution of species and coloration. He also disagreed with Darwin on various issues such as the analogy between artificial and natural selection. However, such disagreements spurred further research and debate, sharpening each man's thinking on several topics. Wallace also challenged many of the assumptions that underlay the Victorian faith in progress and scientific naturalism.

The book is organized into two sections. The first part, entitled "The world of nature", deals with Wallace's work as a field biologist and collector. The second part, "In the world of man, and the worlds beyond", explores the many other interests of Wallace. As the editors admit, this is an artificial separation, but it also roughly follows the chronology of Wallace's life, although his later interests were shaped by his experiences as a child and young man. Since this is an anthology, there is a certain amount of redundancy in the various essays concerning the basic biographical material, his travels, and his fieldwork. This is inevitable, but it also means that each essay stands alone. As the subtitle suggests and as I appreciated, the essays, particularly the essays on Wallace's biological work, emphasize Wallace's legacy for future research. While some caution must be exercised in not reading present-day knowledge back into the past, it is still useful to follow the trajectory of Wallace's many ideas. Much has been written on how Darwin's ideas continue to guide research in virtually all areas of biology, but this volume demonstrates that in many areas of field biology Wallace's ideas have been equally important. Most of the essays in the first part of the book are written by practicing biologists, and at times discuss modern research in more technical detail than may be of interest to a general reader. Yet they are all highly readable and accessible. The volume also has many interesting and often beautiful illustrations and photographs.

In the preface, the reader is introduced to Wallace from the perspective of a field researcher, and an introductory essay discusses Wallace's different places of residence. Andrew

Berry highlights the importance of collecting, in particular Wallace's beetle collection, to the making of the naturalist, which was critical to the development of the theory of evolution. As Wallace said, "Darwin and myself had, what he terms 'the mere passion of collecting,'—not that of studying the minutiae of structure, either internal or external. I should describe it rather as an intense interest in the mere variety of living things ... Now it is this superficial and almost child-like interest in the outward forms of living things, which, though often despised as unscientific, happened to be the only one, which would lead us towards a solution of the problem of species" (p 48–9).

Several essays deal with the specifics of Wallace's research. Norman Johnson discusses the evidence for direct selection for reproductive isolation known as the Wallace effect and Wallace's disagreement with Darwin over the role of hybrid sterility. What is the primary mechanism of hybrid inviability? Johnson follows the controversy to the present day. Two essays are devoted to color, which Wallace thought was one of the most important features under the control of natural selection and which he divided into five categories: (1) protective; (2) warning colors of (a) creatures specially protected, and (b) defenseless creatures mimicking the former; (3) sexual colors; (4) normal colors; and for plants, (5) attractive colors. This classification is still the basis for present-day research, which provides a depth of analysis beyond anything Wallace considered, and these two essays thus are quite interesting. Three more essays explore Wallace's contribution to biogeography (while not strictly its founder, Wallace can be considered the most important person in its genesis), his interest in glaciation, and his contribution to conservation and sustainability. As Berry points out, it is not surprising that naturalists such as Wallace have been so passionate about biodiversity. In our own day, EO Wilson, though perhaps most famous as the founder of sociobiology, describes himself first and foremost as a naturalist and collector, and devotes most of his time now to promoting biodiversity.Collectors value what they collect, and as Berry concludes, "we must ... *have and hold* ... the natural world if we are to understand it" (p 64, emphasis in original). In an age where biological research is increasingly dominated by molecular genetics, much can be learned from Wallace, who was one of the first people to articulate the value of biodiversity.

The second part of the book explores Wallace's many other interests. Peter Raby discusses Wallace's literary legacy while Gregory Claeys discusses Wallace's interest in Robert Owen's socialist vision of the ideal society. While Owen's influence on Wallace has been well documented, Claeys also shows how Wallace differed from Owen in several important ways. In an illuminating essay, Diane Paul points out that although Wallace is often portrayed as a fierce opponent of eugenics, such a view is not quite accurate. Like Galton, Wallace did not accept the Lamarckian view of the inheritance of acquired characteristics. He also agreed that the hereditary characteristics of the population needed improvement; only some form of selective breeding could accomplish such improvement. However, he disagreed with Galton on how this should be accomplished because of his different conception of how natural selection worked and also of what kind of improvement was needed. Thus Wallace rejected Galton's solution not because he thought it was immoral, but rather because it would be ineffectual. Instead, Wallace's hereditarianism, his radical egalitarianism, his views on the capabilities and conditions of women, and his rather conservative views on sexuality and marriage all contributed to a unique and complex view on the role of nature and nurture in improving society. Insightful essays by David Stack and Martin Fichman

explore Wallace's views on land naturalization and his support of the anti-vaccination campaign. Several essays address Wallace's involvement with spiritualism, offering different perspectives. The prevailing view until recently has been that Wallace changed his mind about the adequacy of natural selection in providing a complete account of human evolution because of his involvement with spiritualism. All of these essays provide a much more complex and nuanced view. As Charles Smith in the final essay argues convincingly, if we examine carefully Wallace's personal and professional development, his adoption of spiritualism was neither a change of mind nor a regression. Instead, as Wallace claimed, his new views that incorporated a guiding spiritual agent was rather an extension of natural selection in giving a complete account of the history of life. As Fichman (2004) argued in his biography of Wallace, spiritualism as well as science became nested within an overall theistic belief that increasingly dominated Wallace's thinking as he matured.

Bernard Michaux concludes his essay on biogeography in this volume by writing that he found Wallace "one of the most interesting and possibly most important of Victorian biologists" (p 185). I would expand that claim and assert that Wallace has to be one of the most interesting people in the history of science. This volume does an admirable job in elucidating the reasons why.

References

Fichman M. 2004. *An Elusive Victorian: The Evolution of Alfred Russel Wallace*. Chicago: University of Chicago Press.

About the author

Sherrie Lyons has a PhD in the history of science and is the author of *Evolution: The Basics* (New York: Routledge, 2011), *Species, Serpents, Spirits, and Skulls: Science at the Margins in the Victorian Age* (Albany [NY]: State University of New York Press, 2009) and *Thomas Henry Huxley: The Evolution of a Scientist* (Amherst [NY]: Prometheus Books, 1999). She teaches at the Center for Distance Learning, Empire State College.

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