

Alfred Russel Wallace (2013) *On the Organic Law of Change: A Facsimile Edition and Annotated Transcription of Alfred Russel Wallace's Species Notebook of 1855–1859*

Annotated by James T. Costa. 2013. Harvard University Press, 79 Garden Street, Cambridge, Massachusetts 02138 USA. xii + 573 pages, 49.95 USD, Cloth.

Let me say it right up front: I love this book! Reading it is a bit like listening in on the musings of an eminent colleague, trying to follow their train of thought, catching bits of their reasoning and ideas, and being impressed by their knowledge and insights. Tracing the development of Wallace's thinking on biogeography and evolution as shown through this notebook is both a challenge and a pleasure. Watching him tussle with concepts, such as the definition of a species or the distinction between variety and species, is fascinating. These are concepts that biologists and palaeontologists still struggle with and discuss. Reading about his energetic collecting activities is also absorbing, even though his accounts of orangutan hunts are harrowing. As with any colleague, you don't always agree with everything they do. On the other hand, his strenuous and uncomfortable travels and efforts to conserve and ship his collections elicit wry smiles of empathy.

Wallace is an endearing character. He started life disadvantaged by social circumstances and poverty but by dint of intelligence and incredible hard work turned himself into an outstanding naturalist and scientific thinker. Costa describes him "as the greatest biogeographer of his century." The story of how he came up with the idea of natural selection while recovering from fever in a hut on a remote island is well-known. In a rather touching display of trust, he sent his resulting essay "*On The Tendency of Varieties to Depart Indefinitely from the Original Type*" to Charles Darwin, who received it in June 1858 and was devastated to realize that someone else had had the same idea as him. In a hastily-organized presentation facilitated by Charles Lyell and Joseph Hooker, Wallace's essay and a summary of Darwin's thoughts were read together at a meeting of the Linnaean Society in London on July 1, 1858. Darwin, who was on the spot and had the better

PR machine, has always had the lion's share of the glory for coming up with the idea of natural selection. Yet, to his enormous credit, Wallace seems never to have harboured a grudge or expressed any resentment toward Darwin. He seems to have had a rare modesty and generosity of spirit.

Wallace lived for 31 years longer than Darwin, dying in 1913 at the age of 90. In later life, his reputation became somewhat diminished, in part because of his interest in topics such as spiritualism. His scientific stature was not widely recognized during the 20th century, nor was the range of his achievements well known. He was mainly remembered for defining Wallace's Line. This important biogeographic division between the fauna and flora of the Asian and Australian regions was another discovery that arose from his work in the Malay Archipelago recorded in this notebook. However, in recent years, Wallace has been receiving more recognition for his independent discovery of natural selection and evolution. Perhaps this is because the Darwin bicentennial in 2009 stimulated much in-depth re-examination and re-evaluation of the history of thought concerning evolution in the 19th century. Perhaps it is because with the clarity of hindsight and temporal distance we can now evaluate the contributions of both men more dispassionately. As Costa comments in his introduction, today both "are equally honoured as pioneers and discoverers of one of the most profound insights into nature – and ourselves – yet grasped by humanity."

This facsimile edition Wallace's important notebook has been released in time to commemorate the centenary of his death and as a celebration of his life. It showcases one of ten surviving notebooks generated during his travels in the Malay Archipelago between 1854 and 1862, one of the most formative and influential intervals in his life. The other notebooks comprise field notes, specimen records, and journals. This Species Notebook, started some months after his arrival in Singapore in April 1854, includes accounts of his fieldwork and collecting. But it is more than that. In the interstices between his field activities, Wallace read deeply, especially Lyell's *Principles of Geology*, and recorded his thoughts about what he was reading in this notebook. For Wallace as for Darwin, Lyell seems to have acted as a catalyst for thought; indeed, this incitement to thought was arguably Lyell's most important contribution to science. Wallace was especially concerned to document the points where he disagreed with Lyell – and there were a lot of them – and work out his own counter-arguments. These arguments could have formed the basis for his own book on evolution, a book he never wrote, although, as Costa sadly remarks, it is "the book that should have been." From the perspective of his thinking on natural selection, Wallace's lengthy musings on the fossil and rock records and their implications and the nature and relationship of plant parts are particularly interesting.

The breadth of Wallace's interests and observations is impressive. He described his search for birds of paradise and comments on their varying morphologies and behaviours. He considered and developed a "Plan to stop the further increase of Synonyms," the underlining perhaps emphasizing his frustration with the state of taxonomy, by proposing that a central authority should decide on precedence of names and adjudicate disputes over synonyms. As Costa points out, this anticipated the establishment of the International Commission of Zoological Nomenclature by several decades. Wallace identified and collected many species of insects, primarily beetles and butterflies, especially large and showy taxa, and this notebook contains many observations of their behaviour and habitat preferences, as well as some delightful and detailed drawings.

Wallace also expended much thought on the distinction between instinct and learned behaviour, especially as regards the construction of birds' nests. There are many pages of notes and commentary on this topic in this notebook. It was this train of thought, moreover, that eventually led him to consider the problem of human cognition. In 1869, after returning from his travels in the Malay islands, Costa recounts that Wallace "publicly declared that the human brain could not be explained by natural selection, and that therefore human consciousness and cognitive abilities must be the product of a divine plan of some kind." Unsurprisingly, this viewpoint led to a split with Darwin, and probably in part accounts for his diminished reputation in later years.

Although it spans the interval when he wrote his famous essay, the Species Notebook contains no comments, drafts, or obvious notes related to that work. Readers will share Costa's frustration at the "maddeningly little information" from Wallace during "the very period in which he had his insight into natural selection and penned the landmark paper." His notes do record his bouts of illness and the many "hot rain night[s]" he endured. Perhaps this is explanation enough for his rather perfunctory record of his stay on Ternate and the neighbouring island of Gilolo, now called Halmahera, the place where he actually wrote his essay. "If only," laments Costa, "Wallace had jotted something about his momentous breakthrough." Well, he didn't, but the notes he did leave us make for fascinating if demanding reading nonetheless.

This book is beautifully designed and laid out. The left-hand page has a facsimile of a page from Wallace's notebook, with the handwritten text transcribed next to it. Some facsimile pages include Wallace's drawings or even, in a few cases, pasted in specimens. It is remarkable how clear Wallace's handwriting is, whether he is working out the proper dimensions for specimen labels, writing an account of a day in the field, or tallying his collections. There are few scribbled, illegible, perfunctory or blotched notes here. The facing right-hand page has annotations compiled by Costa, includ-

ing additional information about the life-forms, people, places, and incidents mentioned in Wallace's notes. These are sometimes accompanied by illustrations from Wallace's later publications or other near contemporary sources. Costa also provides background contextual information about Wallace's ruminations on species questions and what he has been reading. These annotations are insightful, informative, and often lengthy. They add greatly to the value of this book and, indeed, many of Wallace's notes would not be comprehensible without these extensive and knowledgeable comments. Costa has done a tremendous job of ferreting out and

elaborating the sometimes opaque references in the notes, especially the mention of people who were probably well known at the time but are now obscured by history. In presenting the Species Notebook to us, Costa has produced a work of admirable scholarship. This book will certainly help to elevate Wallace to his rightful place in the pantheon of 19th century natural scientists and garner him additional respect as an original and perceptive thinker.

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