Topics in Biodiversity and Conservation

Indraneil Das
Andrew Alek Tuen *Editors*

Naturalists, Explorers and Field Scientists in South-East Asia and Australasia

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Preface

A century after the death of the naturalist and co-founder of the theory of evolution through natural selection, Alfred Russel Wallace continues to inspire. Indeed the relevance of Wallace for fields of study as disparate as ecology, systematics, evolution, ethnobiology, biodiversity, and conservation, has never been greater.

The Institute of Biodiversity and Environmental Conservation, within Universiti Malaysia Sarawak (UNIMAS), has been in the forefront of Wallace studies in Southeast Asia, through research and its application, in addition to the organisation of meetings of minds in the field of biodiversity. We organised, between 13 and 15 July 2005, an international conference entitled "Wallace in Sarawak – 150 years later" here in Kuching, Sarawak, which was attended by natural historians, biologists, and other scholars of Wallace studies. The proceedings of the same were published by the Institute in 2005. A second conference on the same broad theme, "Wallace 2013. 2nd International Conference on Alfred Russel Wallace – His Predecessors and Successors. Naturalists, Explorers and Field Scientists in Southeast Asia and Australasia" was also organised by our Institute on 7–8 November 2013. The present volume comprises selected papers presented at this most recent effort to honour Wallace and to remember his legacy, a century after his passing.

We have organised the papers into three broad themes: *Wallace and His Period* presents papers on the life and contributions of Wallace, and those of some of his contemporaries, from museum builders to evolutionary theorists. *Natural History and Systematics* gathers together papers as diverse as the contribution of systematics to understanding the zoological sciences, as well as autecological and community level studies. Finally, *Biodiversity and Conservation* brings together studies on biodiversity and conservation of the Wallace area, from trees to butterflies, frogs to birds and dolphins. It concludes with the all important paper that challenges the conventional views on economic growth, and how sustainable development and conservation need to be incorporated into the rapid economic development now taking place in the region where Alfred Russel Wallace spent his defining years.

We are grateful to a number of individuals and agencies for supporting the conference on which this volume is based: to the State Government of Sarawak for sponsoring the Conference, and to Tan Sri Datuk Patinggi Haji Adenan Satem, then

Minister of Special Functions, Sarawak, and currently, Chief Minister of Sarawak, for delivering the inaugural speech. Our partners, the Sarawak Forestry Corporation and the Sarawak Museum, including Oswald Braken Tisen and Charles Leh, formed the backbone of the organising committee. Within UNIMAS, we are grateful to the staff of the Institute of Biodiversity and Environmental Conservation, and our graduate students helped with all stages of organising the meeting and presenting papers. Individual manuscripts were reviewed by Aaron M. Bauer, C. Kenneth Dodd, Michael Flannery, Gathorne, Earl of Cranbrook, Ulmar Grafe, Stefan Hertwig, Robert F. Inger, Elena M. Panova, and Mustafa Abdul Rahman. Finally, we are thankful to David L. Hawksworth, for initiating the idea of this volume, and Nel van der Werf of Springer for seeing the volume through press.

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Part I
Wallace and His Period

Wallace and Incipient Structures: A World of 'More Recondite' Influences

Charles H. Smith

Abstract Alfred Russel Wallace is well-known for his co-discovery of the principle of natural selection. Natural selection is usually considered a process, but it is not clear that Wallace regarded it in exactly these terms. In fact he more likely thought of the relationships involved as representing what we would now term a "state space," a negative feedback loop wherein populations are maintained at healthy levels through elimination of the unfit. Both before and after the advent of natural selection, Wallace clung to the idea that "more recondite forces" were shaping the nature and direction of evolution; this is especially evident in his treatment of incipient structures, and continuing allusions to the probable existence of extenuating local influences on process. In this work, the history of these leanings is detailed, in the hope that Wallace's overall position on evolution may be better understood.

1 Introduction

In February of 1858, Alfred Russel Wallace, weak with fever, had a now-famous epiphany. Recalling his field experiences of the past several years and adding to them the logic of Malthus, he came up with a principle, natural selection, which seemed to explain how populations might indefinitely move away from "original types." Pleased with his thinking, he decided to write up the idea as an essay and send it to Charles Darwin, who he knew through earlier correspondence, was interested in the subject. But his real target was Charles Lyell, whose theories on biogeography he had just challenged in a paper published in late 1857 (Wallace 1857), and to whom Wallace was asking Darwin to relay the manuscript if he thought it worthy. Wallace now had a theory that backed his criticisms, and he must have been very eager to receive some feedback. Fate intervened, however, and Lyell never

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responded: instead the essay was read before the Linnean Society 2 weeks later and published immediately, without Wallace's permission.

Although initially Wallace was overjoyed to receive this attention from two of the world's top naturalists, as time wore on he seems to have become less pleased about this treatment. Although too polite to be outwardly derogatory, he nevertheless drew attention no fewer than five times over the next 40-odd years, in print, to how he had never been given the option of going over proofs before the essay was published. Was there something more – or less – that he had wanted to say? Had he been prematurely cut off, and then unfairly cast as a "Darwinist," as opposed to just an "evolutionist"?

The ramifications of this question will never be thoughtfully explored if we continue to pay most of our attention to the Ternate essay in terms of sensationalist accusations of intellectual theft on the part of Darwin. Frankly, of what importance is this matter to Wallace studies? Does it help us better understand Wallace's intellectual path to that point? I think not.

In this paper, I will examine some threads of that journey that I feel go a long way toward explaining Wallace's words in the Ternate essay, and many of his subsequent directions. Let us begin by noting that Wallace himself regarded his principle not as a theory, but as a law (see Wallace 1870a: 302, and many other such referrals); accordingly, in Wallace's eyes natural selection was not so much the "survival of the fittest" as it was the "elimination of the unfit." Lest there be any doubt on this score, note the following Wallace words, three from published articles of his:

> Natural selection . . . does not so much select special variations as exterminate the most unfavourable ones (from an 1866 letter to Darwin printed in Marchant 1916).
>
> The survival of the fittest is really the extinction of the unfit. In nature this occurs perpetually on an enormous scale, because, owing to the rapid increase of most organisms, the unfit which are yearly destroyed form a large proportion of those that are born (Wallace 1890: 337)
>
> The survival of the fittest is really the extinction of the unfit . . . (Anonymous 1893: 3)
>
> It is undoubtedly this survival, by extermination of the unfit, combined with universally present variation, which brings about that marvellous *adaptation to the ever-varying environment* . . . (Wallace 1908a: 424)
>
> The survival of the fittest is really the extinction of the unfit . . . (Wallace 1913: 152)

Wallace's view of the matter is also evident in famous words he included in the Ternate essay itself:

> . . . The action of this principle is exactly like that of the centrifugal governor of the steam engine, which checks and corrects any irregularities almost before they become evident; and in like manner no unbalanced deficiency in the animal kingdom can ever reach any conspicuous magnitude, because it would make itself felt at the very first step, by rendering existence difficult and extinction almost sure soon to follow (Wallace 1858: 62).

In 1972 the anthropologist Gregory Bateson made a related observation:

> . . . The steam engine with a governor is simply a circular train of causal events, with somewhere a link in that chain such that the more of something, the less of the next thing in the circuit . . . If causal chains with that general characteristic are provided with energy, the result will be . . . a self-corrective system. Wallace, in fact, proposed the first cybernetic model . . . Basically these systems are always *conservative* . . . in such systems changes occur to conserve the truth of some descriptive statement, some component of the *status quo*. Wallace saw the matter correctly, and natural selection acts primarily to keep the species unvarying . . . (Bateson 1972: 435)