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From the Selected Works of Charles H. Smith

2013

The Real Alfred Russel Wallace: Essays on an Outside-the-Box Thinker.

Charles H Smith, *Western Kentucky University*

Preface by Jean Gayon



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By
Charles H. Smith

Original English text of *Enquête sur un Aventurier de l'Esprit: Le Véritable Alfred Russel Wallace* (2013). Paris: Editions de l'Evolution.

Table of Contents

<i>Preface</i> (by Jean Gayon)	1
<i>Introduction</i>	5
<i>Chapter One.</i> Some Personal Matters	13
<i>Chapter Two.</i> How Wallace Came to Natural Selection: Final Causes Part One	21
<i>Chapter Three.</i> Wallacian Natural Selection and Biogeography: Past and Future	42
<i>Chapter Four.</i> Wallace and Darwin: The Ups and the Downs	60
<i>Chapter Five.</i> Wallace and Spiritualism: Final Causes Part Two	71
<i>Chapter Six.</i> Change of Mind / No Change of Mind?	96
<i>Chapter Seven.</i> Wallace and Social Responsibility	110
<i>Chapter Eight.</i> Wallace On...	123
<i>Coda</i>	138

Preface by Jean Gayon

(translated from the original French by Charles H. Smith, Sean Kinder and Valerie Kinder)

Charles Smith has subtitled his work “The Real Alfred Russel Wallace.” This phrase suggests that remarks about the great English naturalist are often approximations, or even caricatures. Yet there is not a lack of excellent books on Wallace. Their number probably has nothing to do with the products of the Darwin industry, though one cannot help but notice their proliferation over the past ten years or so¹; these works, along with many more in the history of science journals, have profoundly renewed our image of Wallace, his biography and his work. The hallmark of the present study is its departure from historiographies too centered on the relationship between Wallace and Darwin, the two co-discoverers of the principle of natural selection. Without doubt neither thinker would have developed their scientific work as they did had their paths not crossed in 1858, but

that encounter, and the relations they maintained until Darwin's death, are certainly not enough to express the full complexity of Wallace's personality. Smith is filling an important gap: his work is perhaps the only one to propose an intellectual portrait centering fully on his model. Darwin is certainly visible on the scientific scene, but the reader of the book will come out with a view free of the bias of perspective that affects the vast majority of studies that, so to speak, tend to arrange Wallace's thought in relation to Darwin's (sometimes for, sometimes against, sometimes otherwise). The work also avoids social caricatures that too quickly take at face value the contrasts between a wealthy aristocrat and a "man of the people." Smith well shows that if we want to place Wallace among the English class structure of his time, it is better to view him as a member of the "middle class" than as a member of the "working class."

It is worthwhile here to say a few words about the author, as this will help clarify the nature of the content of the work. It is undoubtedly as a biogeographer that Charles Smith came to be interested in Alfred Russel Wallace, whose studies on the faunas of the Amazon Basin and Malay Archipelago are frequently cited. Charles Smith opportunely reminds us that Wallace is unquestioningly one of the great names in the history of biogeography. He was in effect an originator, with Philip Sclater (1829-1913), of the dominant hypothesis that structured the field for nearly a century – that the speciation and divergence of species is a consequence of the dispersal of populations. Even if Wallace had no connection to Darwin, either personally or intellectually, he would still be known for this work.

Another aspect of the author's biography should be emphasized. Along with his studies in biogeography and the history of science, he developed his career as a librarian, specifically at Western Kentucky University as its science librarian. He still occupies that position, having the rank of Professor since 2004. This is how Charles Smith has been able to devote a considerable amount of time collecting the writings of Wallace and putting them online. It is thanks to him that one can today consult an inestimable database containing the most exhaustive bibliography of writings by and on Wallace, as well as complete transcriptions of most of his articles². The greater portion of these texts has been identified by Charles Smith himself. As the author recalls, up until 1991 Wallace's bibliography had hardly changed since James Marchant's famous compilation made in 1916³, which comprised around 300 titles. Thanks to Charles Smith, that number then increased to 750 titles⁴.

Today, again thanks to him, it has easily passed one thousand titles. One can better understand, under these circumstances, the author's commentary about himself: "I have spent far more time studying the work of Wallace than anyone else, living or dead."

Thanks to his unsurpassed knowledge of the writings of and about Wallace, Charles Smith is able to offer here a nuanced and critical view of numerous aspects of Wallace that are sometimes caricatured (in particular the nature of his engagement with spiritualism, his relations with Darwin, his socialism, his opposition to mandatory vaccination, his land nationalization campaign, the real substance of his book on the planet Mars, his commitment to the conservation of species and landscape), sometimes misunderstood, through simple ignorance. From this point of view, the last two chapters offer a striking panorama of the range of topics to which Wallace was committed, at times leaving an enduring footprint: reflections on economics, viz. land economics and paper

money (criticism of the gold standard, which the American economist Irving Fisher found convincing, dedicating one of his works to Wallace); astronomy and geology, viz. the fabrication of mirrors, controversy with flat earthers (already !), the origin of alpine glaciers; and innumerable social issues – reform of the House of Lords, abolition of succession, criticism of will-based inheritance, advocacy for cultural and educational policies that truly serve all, voting rights for women, protection of historical monuments, Irish autonomy, etc. Taking note of such a diversity of reflections, published in the greatest scientific and public opinion journals of the time, we can understand what fascinated Wallace's contemporaries, especially those in England and the United States. Not only was Wallace considered the greatest naturalist of his time after the death of Darwin, but he was also a committed thinker on all fronts, respected and in demand for the precision of his arguments on difficult subjects. We can have unlimited admiration for Darwin's evolutionary thoughts due to their inventiveness, rigor, and prophetic character; from a historical point of view, however, it is clear that Wallace had thoughts and a life that were infinitely richer and more interesting. Such is the principal lesson that I draw from reading Charles Smith who, as I would acknowledge, has not put the matter so crudely.

Although Charles Smith relativizes Darwin's place in Wallace's biography, he does not shrink from the subject. He insists on the asymmetry of the situation created in the spring of 1858, when Darwin received Wallace's essay that was similar to so many of the ideas that he had been developing, without publishing, for nearly twenty years. It was indeed only several years after the death of Darwin, in 1887, that Wallace became aware of the firestorm his letter had produced at the home of the naturalist of Down. That event is not well known; the description given by Charles Smith is likely to profoundly modify the appreciation we have of the real human relationship that existed between the two men, a relationship that has often been described too much from Darwin's point of view alone. I will say no more about the fascinating chapter devoted to that relationship, and more particularly to the "rediscovery" episode, but Smith's interpretation seems balanced to me. According to him, the relationship was mutually beneficial: Wallace gained visibility from it, and Darwin found a momentum he had previously lacked.

The most astonishing pages in the book are those given over to Wallace's spiritualism and, more broadly, to the manner he treated "spirit" in his work. In this regard, the French title of the book constitutes a bit of a wink: "Enquête sur un Aventurier de l'Esprit": the spirit, as much as spirits, holds a major place in Wallace's thought.

Concerning spirits and spiritism (most commonly called "spiritualism" in Wallace's time, both in English and in French), Charles Smith insists that Wallace's approach to this subject was both scientific and positivistic. Like many scholars and philosophers of the second half of the nineteenth century and beginning of the twentieth century (for example William James, Henri Bergson, or the physiologist Charles Richet, Nobel Prize winner in physiology and medicine), it was an open question from the point of view of scientific experiment as to whether human beings have unsuspected mental capacities, ones not to be found elsewhere in the animal world. Wallace, though he was never able to produce convincing experimental evidence, constantly declared that we should try to approach the question from that angle, and not reject it. That side of things has been commented on many times by historians. Less so has been the profound connection between Wallace's adoption of spiritualism and his general vision of human evolution and evolution alone.

Through a remarkable play of quotations, Charles Smith draws attention to the connection between Wallace's spiritualism, and his conception of evolution as directed by humankind. After reading these texts, and Smith's analyses, it seems to me that the several levels of thought are intertwined. They are probably not perfectly articulated, but they are there. In the first place, Wallace, as far back as one can go in his evolutionary thinking, had always been diffident to the idea that the emergence of human mental capacities, and in particular consciousness, could be explained through the same natural processes that explain the origin of adaptations in all the living world. That is why he came to it very quickly, after having tried to apply the principle of natural selection to the question of the origin of the mental and moral capacities of humans (1864), to write that such an explanation was not sufficient, and to say that the evolution of these faculties had brought into play forces and "spiritual beings" he did not regard as part of the supernatural, but instead part of natural properties and laws differing from those involved in the ordinary evolution of living species.

Just like Darwin, who felt "horrified," the modern reader feels uneasy confronted with such a notion from one of the greatest biologists of his time. However, one should take account of a second stage, as it were, of Wallace's thinking about the origin and evolution of the mental capacities of the members of the human species. Indeed, Wallace doesn't simply recognize a role for spiritist phenomena (I say "phenomena" to emphasize the natural aspects of this first stage in his thinking), he situates them within the framework of a general speculation on evolution. Smith gives a surprising citation from 1870, in which Wallace says "that a superior intelligence has guided the journey of man in a definite direction, and for a special purpose," contributing to "the production of what we can hardly avoid considering as the ultimate aim and outcome of all organized existence – intellectual, ever-advancing, spiritual man." Smith points out that Wallace had no direct and miraculous intervention in mind in the course of natural history. His hypothesis is that to understand the origins of humankind, it was necessary to supplement the theory of evolution by natural selection with laws regulating, on the one hand the role of the spirits, and on the other hand the action of the surrounding world (what later was called the environment). Here we touch on the most delicate point in Wallace's thought, but also perhaps the most interesting from the point of view of the history of ideas, if the history of science cannot simply be a history of sanctioned truths, to use Gaston Bachelard's famous expression.

Many of Wallace's texts show, in fact, that even if all the allusions to spiritistic phenomena and unsuspected human mental capacities were removed, the Wallace that remains could only be described as a deistic evolutionist, that is to say, an evolutionist convinced that evolution results from a set of natural laws that, when implemented, converge toward man and, beyond, toward the advent of the spirit. Wallace actually explored several avenues to justify this view. Spiritist phenomena constituted one of them, probably not the most convincing for his scientific readership, and this avenue was also probably motivated by beliefs that included the trends and moral conceptions of the time period, which Smith analyzes profoundly. The other major way, which he explored more speculatively than empirically, was that of a theory of evolution taking into account the complexity of interactions between species, and the social interactions within the human species. Moreover, Charles Smith does not fail to mention his own scientific interest in the theme of complexity. In one biographical introduction⁵ he mentions Spinoza, Teilhard de Chardin, and Wallace as those individuals who most influenced his thought.

I do not mean to suggest that the author of this book only found in Wallace what he was looking for. Instead, I think that his atypical scientific-philosophical positioning, in an evolutionary intellectual space dominated by systematic Darwinism, allowed him to identify better than many others Wallace's deep intellectual motivations, and to divine, if not their total coherence, at least their great resonances. Like Darwin, Wallace sought to leave no place for miracles in the explanation of evolution in its entirety, that is to say, including in it the emergence of humanity's mental and moral capacities. But unlike Darwin, he was not content to explain such by means of variation and natural selection alone. Hence his efforts to make room, sometimes for spirits, sometimes, more radically, for an intelligence guiding the growing complexity of the world from a distance through a set of natural laws, some of which remain unknown to us; sometimes also by prospective reflections on the more important place that the interactions between species and their complex biotic physical environment should play in the theory of evolution (remembering Wallace the biogeographer). We should be grateful to Charles Smith for revealing the delicate architecture of this speculative reflection, and restoring its omissions and difficulties. I don't know whether Charles Smith has given the definitive portrait of the "real Wallace," but I am certain that his work will be a milestone, in that it invites us to explore "another Wallace" than the one in Darwin's shadow, one that other historians and philosophers will probably be keen to locate on the map of evolutionism.

Jean Gayon,
Professor at the University
Paris 1 – Pantheon Sorbonne

¹ Notably: P. Raby, *Alfred Russel Wallace, A Life*, London, Pimlico, 2001 (French translation by Editions de l'Evolution, under the title *Alfred R Wallace, l'Explorateur de l'Evolution*, 2013); M. Fichman, *An Elusive Victorian*, Chicago, The University of Chicago Press, 2004; Michael Shermer, *In Darwin's Shadow*, New York, Oxford University Press, 2002; Ch. H. Smith & G. Beccaloni, *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace*, Oxford, Oxford University Press, 2008; J. Reisse, *Alfred Russel Wallace, Plus Darwiniste que Darwin mais Politiquement Moins Correct*, Bruxelles, Presses de l'Académie Royale de Belgique, release in November 2013.

² *The Alfred Russel Wallace Page*: <http://people.wku.edu/charles.smith/index1.htm>.

³ J. Marchant, *Alfred Russel Wallace: Letters and Reminiscences*, New York and London, Harper & Brothers Publishers, 1916.

⁴ C. Smith (ed.), *Alfred Russel Wallace: An Anthology of His Shorter Writings*, Oxford, Oxford University Press, 1991.

⁵ <http://people.wku.edu/charles.smith/index.html>

Introduction

Alfred Russel Wallace (8 January 1823 – 7 November 1913), English polymath and social critic, ranks high on the list of the most interesting characters in the history of science. Nevertheless, and despite a life filled with achievement, he has often been marginalized in the halls of learning. The truth is, Wallace was something of an "outside-the-box" thinker, and his many forays into the murkier areas of science and social science cost him a lot of potential supporters. Still others, while recognizing his intellectual talents in general, have looked at the full span of his work and interests as a collection of hits and misses.

I personally believe it is too early to summarily dismiss Wallace as a crank who supported a few too many divergent social and intellectual causes. In his time he was recognized as one of the top scientific reasoners, and his trains of thought led to many new and important conclusions. While it is true science has moved on in the one hundred years since his death, it is difficult to find an individual over its history who was more dedicated to the discovery of truths, and in so many different subjects. In a book review of Wallace's work *Studies Scientific and Social* the renowned philosopher Charles Peirce once said of him:

Not quite a typical man of science is Wallace; not a man who observes and studies only because he is eager to learn, because he is conscious that his actual conceptions and theories are inadequate, and he feels a need of being set right; nor yet one of those men who are so dominated by a sense of the tremendous importance of a truth in their possession that they are borne on to propagate it by all means that God and nature have put into their hands – no matter what, so long as it be effective. He is rather a man conscious of superior powers of sound and solid reasoning, which enable him to find paths to great truths that other men could not, and also to put the truth before his fellows with a demonstrative evidence that another man could not bring out; and along with this there is a moral sense, childlike in its candor, manly in its vigor, which will not allow him to approve anything illogical or wrong, though it be upon his own side of a question which stirs the depths of his moral nature.¹

There are three main reasons, I think, for acquainting oneself with Wallace's life and work. First, he lived a very interesting life, both in terms of where it physically took him (he is one of history's foremost naturalist-explorers), and how his intellectual explorations led him into the lives of others. Second, his accomplishments were substantial in an absolute sense: as well as being the second most important figure in the development of the theory of natural selection, he is now recognized as: history's premier field naturalist and tropical biologist; the "father" of modern biogeographical studies; a founder of the study of astrobiology; a significant contributor to theory in anthropology, glaciology, and some other studies; and an important forerunner to the twentieth century's "Liberal Agenda" in the worlds of sociology and politics. Third, we are perhaps not "through" with Wallace: his philosophical perspective suggests possible new ways of looking at natural and social processes that have been slighted as the result of an overemphasis on the more "four-square" views of Charles Darwin.

The present work is not even loosely a biography; instead I have worked up a set of essays that examine what I feel to be critical or interesting elements of Wallace's life and thought process, including a number of recent findings. In some cases my interpretations are not endorsed by the entire academic community, but in my defense I should note that I have almost certainly spent a good deal more time studying Wallace's work than anyone else, living or dead. As a biogeography graduate student in the late 1970s I was impressed by Wallace's versatility, and began to seek out writings of his missing from then-existing bibliographies. Most of these had been entirely forgotten, but some turned out to supply information that has helped us better understand the range of his world view. In a work published in 1991² I compiled a set of Wallace selections in the form of an anthology; the book also featured a list of all Wallace publications I was aware of by that

¹ *Nation* 10 January 1901: 36–37.

² *Alfred Russel Wallace: An Anthology of His Shorter Writings*. Oxford University Press, 1991.

date. The tally at that point was more than seven hundred items, up by about 350 from the number recorded in the previously most thorough accounting.³ Subsequently I continued my search for Wallace publications,⁴ and as of this writing a further four hundred or so have been added to the list, bringing the overall total to well more than one thousand items. I have transcribed almost all of these items for inclusion in my *The Alfred Russel Wallace Page* website,⁵ which means, considering my rigorous transcription standards, that I have personally read through all of these works a minimum of three times each. This has provided me ample opportunity for reflection on what Wallace said, and why.

My Wallace website is primarily bibliographic and archival in nature, thereby serving as a starting point for others contemplating research on the man. Regardless, I am mainly a scientist by training, and it is the intellectual content of his writings that most interests me, and how this content might continue to contribute to various aspects of thought in the fields of biogeography, ecology, and systems theory. One of Wallace's ideas formed the core concept for my doctoral dissertation, and another has served to fuel my years of exploration of a Benedict de Spinoza-based general systems theory approach to the nature of space (*i.e.*, spatial extension). I am a firm believer in the idea that a knowledge of history can serve the future.

Although I just stated that the present work does not qualify as biography, it yet seems necessary to start it off with a brief review of Wallace's life. With this background the reader not familiar with his story should find it much easier to digest the content of the eight chapters that follow.

* * *

Wallace came from a long, respectable line of Englishmen. His two-volume autobiography *My Life* (1905) spells this out in some detail: his father's family ultimately derived from Scottish roots, though nothing in *My Life* suggests that this was anything more than an ancient connection; on his mother's side the Greenells, so far as Wallace was aware, had made their home in southern and central England since at least the 1500s. Both sides of the family could be viewed as more or less middle-class folks, with occasional representatives attaining positions of distinction or political power. Wallace's father, Thomas Vere Wallace, had prepared himself for a law career, and in fact was sworn in as an attorney-at-law in 1792. But, benefitting from a modest annual inheritance, he instead spent the next fifteen years of his early adulthood living a life of leisure (even allegedly associating with the legendary Beau Brummel for a period). When he married in 1807, this changed, as he reasonably decided to try to augment his income in the interest of better supporting his family. Between 1808 and 1816 five daughters were born (only one, Fanny, born in 1812, made it past the age of twenty-two); four sons followed between 1809 and 1829. T. V. Wallace had literary aspirations, but his attempts to follow them out failed and he was forced into a string of employments that were not very lucrative.

³ James Marchant, ed., *Alfred Russel Wallace: Letters and Reminiscences*. Harper & Brothers, 1916.

⁴ The vast majority of these are books, essays, technical writings, letters to the Editor, book reviews, published personal letters, etc., etc., but I also recognize published third-person accounts of comments made at professional meetings, co-signed memorials, and a few other odds and ends.

⁵ <http://people.wku.edu/charles.smith/index1.htm>

Originally based in London, the family found living expenses increasingly daunting and they moved to the country, settling in Usk, Monmouthshire, around 1820. It was there in 1823 that Wallace was born. When Wallace was five or six, in late 1828 or early 1829, the family packed up again and moved over to Hertford (a relative had died, freeing up inexpensive lodging). Most of Wallace's childhood was spent in Hertford, where over a period of about eight years the family lived at at least five addresses, and where Wallace attended Hertford Grammar School.

In late 1836 the family's finances took a significant turn for the worse, and young Alfred, now just short of fourteen, was forced to leave school. He was sent to London to live with his older brother John, who was apprenticed to a master builder. Several months later Wallace was shipped off to work for his oldest brother, William, who was developing a successful practice as a land surveyor in the western counties. Except for a temporary stint with a watchmaker in 1839, Wallace remained with William until late 1843, when a lull in work forced his brother to let him go. Despite his meager formal education, Wallace's several years with his brother had honed his abilities in a number of practical skills, and he used this experience to secure a teaching position at the Collegiate School in Leicester. He stayed for a little over a year, when in February 1845 William suddenly died, and Alfred returned to the area where his brother had been operating, South Wales, to take over his business. He became increasingly disenchanted with the management side of the work, however, and in late 1847 decided to turn to natural history collecting as a means of supporting himself. Enlisting a friend he had met in Leicester, Henry Walter Bates, he set off for the New World in early 1848 with the intention of making a name for himself in this new endeavor.

These are the basic facts for this early period of Wallace's life, but they conceal a number of important subtexts. To begin with, Wallace's father was a well-read man, and while the family lived in Hertford he worked for some significant period in the town's library. Wallace thus had access to plenty of good literature while growing up, and developed a voracious appetite for reading that served him well for the rest of his long life. Another important influence took place shortly after his removal from Hertford to London. There he was exposed to an Owenite faction (once hearing Robert Owen himself speak), whose socialist/utopian views would also remain an element of his thought to the end of his days.

It was while spending time in the field as an apprentice to his brother William that Wallace first took an interest in natural history subjects, starting with geology and botany. When he met Bates in Leicester in 1844, his curiosity was aroused by the younger man's dedication to insect-collecting, and zoological matters began to dominate his interest. Two other important influences also found their way to Wallace during his stay in Leicester. Several books attracted his attention;⁶ he also attended a lecture on the newly-developed practice of mesmerism, a capacity for which he soon found to be one of his own latent talents. As at that time most observers were regarding mesmerism as a hoax, this left him with something important: as he later put it, his "first great lesson in the inquiry into these obscure fields of knowledge, never to accept the disbelief of great men, or their

⁶ Including, possibly, the anonymously-penned *Vestiges of the Natural History of Creation* (Robert Chambers was later revealed to be the author), which promoted the notion of organic evolution. This was first published in 1844, while Wallace was living in Leicester, but he only first mentions reading it in a letter to Bates from November 1845, by which point he had moved back to Wales.

accusations of imposture or of imbecility, as of any weight when opposed to the repeated observation of facts by other men admittedly sane and honest.”⁷

With these experiences under his belt, Wallace stepped off the boat at Para, Brazil, at the mouth of the Amazon, in the spring of 1848. He and Bates expected to be able to make a living collecting insects (and birds, and perhaps a few other things that came their way) for sale to back-home collectors; meanwhile they would explore the countryside and search for clues as to how organic evolution takes place. It turned out to be a feasible plan, though early on the two young naturalists split up, with Wallace concentrating primarily on locations farther up river. After four years, however, his strength began to fail. Wallace, who had by then reached the upper tributaries of the Rio Negro, managed to get back to Para; along the way he learned that his younger brother Herbert, who had joined the expedition a couple of years earlier but had decided this was not the life for him, had died of yellow fever before being able to return to England. Accompanied by two years or more of his collections, Wallace left Para for Britain on 12 July 1852.

The ship he was sailing on made it well out into the Atlantic Ocean, then promptly caught fire, burned, sank, and took virtually all of Wallace’s collections with it. He and the ship’s crew spent ten miserable days in the open ocean in a pair of decrepit lifeboats, then were fortunate enough to be intercepted by a passing merchant vessel. After a total of eighty days at sea Wallace eventually made it back to London, where he at least was able to collect on an insurance policy his collections agent had set up for him.

For some this might have been more than enough to keep them home permanently, but Wallace had found his niche and was not about to give up until he found what he was looking for: an explanation for the process of organic evolution. Less than two years after leaving South America he was off again, this time to the archipelago environs of Southeast Asia. He arrived in Singapore in April of 1854, and immediately set to work.

Over the next eight years Wallace collected on almost all of the major islands now comprising Indonesia, and sent home the staggering total of more than 125,000 specimens, mostly birds and insects. In addition to finally figuring out the apparent main driving mechanism behind organic evolution, natural selection, he made a variety of other discoveries ranging through the fields of physical geography, biogeography, zoology, ethnography, and ecology. From the field he delivered three milestone papers, including the one on natural selection that sent Charles Darwin scurrying to get into print with his *On the Origin of Species*. The expedition was, to put it mildly, a major success.

By the time Wallace returned to England from the field in 1862, he was a minor celebrity. Not a man to rest on his laurels, he plunged into the discussions taking place at the meetings of several major scientific societies,⁸ and over the next ten years published nearly five hundred pages of systematic revisions drawn in large part from the materials he had collected. He also began to contribute essays on various theoretical subjects such as mimicry and animal distribution patterns. In 1869 he brought out *The Malay Archipelago*, a brilliant account of his years of travel and study in the East, and a year later

⁷ “Notes on the Growth of Opinion as to Obscure Psychical Phenomena During the Last Fifty Years.” *The Two Worlds* 15 Sept. 1893: 440–441.

⁸ Specifically, the Zoological Society of London, Entomological Society of London, Royal Geographical Society, Anthropological Society of London, Linnean Society of London, British Association for the Advancement of Science, and Ethnological Society of London.

Contributions to the Theory of Natural Selection, a set of essays. These assured his permanent reputation as a naturalist of the first rank.

Meanwhile, however, Wallace had also been immersing himself in a rather different kind of study: spiritualism. In late 1866 or early 1867 he became a full convert, and this would have some repercussions. For example, at a meeting of the British Association for the Advancement of Science held in late August 1868 he was described as stating: "With regard to the moral bearing of the question as to whether the moral and intellectual faculties could be developed by natural selection, that was a subject on which Mr. Darwin had not given an opinion. He (Mr. Wallace) did not believe that Mr. Darwin's theory would entirely explain those mental phenomena."⁹ Several months later, in a review of new editions of books by Charles Lyell, the geologist, Wallace put his opinion into print to the view of all. Darwin and others were shocked, but there it was.

Within a few years Wallace was beginning to publish essays on social and economic issues, even as he started to piece together his classic biogeography tome *The Geographical Distribution of Animals*. Concerning the former, his logical but offbeat suggestions caught many by surprise, and elicited little positive attention from the power brokers. The latter, on the other hand, published in 1876, was immediately welcomed as a masterpiece. He followed it up with two further biogeographical works, *Tropical Nature and Other Essays* and *Island Life*, in 1878 and 1880, respectively. These two also met with great success.

For the rest of his life, spent mainly in England, Wallace carved out a career as a writer on a variety of natural history and social subjects. In 1881 he was one of the founders of the Land Nationalisation Society, an organization dedicated to divesting ownership of the land from large holders. He was the society's first president, and served through to his death in 1913. He became an anti-vaccinationist, and campaigned for this cause too. As we will see later, he eventually declared himself a socialist, and spoke up on many other social issues as well.

At the same time he did not neglect scientific subjects. He remained a staunch defender of most Darwinian tenets, and after Darwin's death in 1882 became *de facto* Darwinism's leading spokesperson. In 1889 he published the book *Darwinism*, considered by many the best late nineteenth century treatment of the subject. Through the 1880s and 1890s he wrote a number of important works on biogeography and glaciology. In 1903 he wrote a contentious book on astronomical cosmology, and a few years later followed it up with an analysis of the likelihood of finding advanced life on Mars (to counter claims by several astronomers that they had observed constructed "canals" on the surface of that planet). In 1910 he put out his final natural science work, *The World of Life*, which sought to bring it all together. His final books overall were a pair of social criticism studies published in 1913, the year of his death at age ninety.

Wallace's personal life after returning to England in 1862 was not without its financial difficulties, especially, but on the whole he managed to make a decent living, and died comfortably. He married in the spring of 1866; his wife was twenty-three years his junior, but they seem to have had a good marriage plagued with few major problems, and enlivened by a lot of gardening. There were three children: two, a boy and a girl, who far

⁹ *Athenæum* 19 September 1868: 373–374.

outlived him, and one, a boy, who died in early childhood. As of this writing, Wallace's only two grandchildren, born after his death, are still alive – a remarkable direct connection back to 1823.

After returning from the East in 1862 Wallace travelled outside the country relatively little, with one notable exception. In late 1885 he was invited to give a series of talks on evolution at the Lowell Institute in Boston; he accepted the offer, and after delivering them in the fall of 1886 set out on a lecture tour across the United States and Canada that lasted another eight months. I have just published an “enhanced” transcription of the travel journal Wallace kept during that trip that the reader might find interesting.¹⁰

* * *

The preceding “basic primer” out of the way, we can turn to the eight essays that make up the main body of the present work. Organizing these has been a bit of a challenge, as so much of Wallace's thought process cut across multiple subjects, and emerged at various times over his career. I believe there is a general consistency to his world view that is not well-served by minute dissection. I therefore favor thematic treatments over biographical/historical ones. At the same time, questions have arisen regarding a number of specific episodes in his life, so it seemed worthwhile to update readers on these here as well. Thus the essays that follow feature, as appropriate, either approach.

Chapter one, “Some Personal Matters,” starts things off in a biographical mode, dwelling on several recently discussed matters that are largely independent of one another. Investigations into his family, his actual birth date and the origin of his name, his characterization as an Englishman, his relative wealth as an adult, the level of his fame as an adult, and a recently discovered natural history cabinet attributed to him, are taken up. None of these things are, frankly, of deep importance in the greater scale of things, but they do suggest some lessons (or regrets) about celebrity, and what it means to different observers.

In Chapter two, “How Wallace Came to Natural Selection,” I review this complicated path, regarding it not as a simple progression, but instead one that produced conclusions based on his recognition of various aspects of evolution – both biological and human social – as he pondered the matter through his personal experiences and reading, and in the field. I will argue that his 1858 essay on natural selection represented something of a compromise that responded to the various threads of his thought to that point, but was itself probably an unexpected turn, and never one intended as a final solution to the question.

Chapter three, “Wallacian Natural Selection and Biogeography,” reviews what I see as some of Wallace's central thoughts in these studies, both in terms of what he has actually been credited with by history, and how I believe that his ideas are still capable of opening up new horizons.

In Chapter four, “Wallace and Darwin: The Ups and the Downs,” I look at one of the most remarked upon elements of Wallace's world, his relations with Charles Darwin. This

¹⁰ *Alfred Russel Wallace's 1886–1887 Travel Diary; The North American Lecture Tour*. Siri Scientific Press, 2013.

features a range of emotions: friendship, competition, mutual respect, greed, professional exchange, doubt, and perhaps even guilt. Research continues to produce new perspectives on this important part of Wallace's life, and while I personally have not contributed much to this discussion, I still have some opinions.

Chapter five, "Wallace and Spiritualism," explores Wallace's attraction to this belief, and how it relates to his ideas on human evolution. In this chapter I first review the history of Wallace's adoption of spiritualism, then take up a number of related subjects, such as the recent attempts to characterize him as a "proto-ID" figure, and the potentially more productive avenue of final causes-based science.

Chapter six, "Change of Mind/No Change of Mind?," to a certain extent synthesizes the preceding four chapters by presenting a theory of Wallace's evolution of thought *circa* 1858 to 1869. At issue is whether he underwent a "change of mind" regarding the place of natural selection in the evolution of advanced beings.

In Chapter seven, "Wallace and Social Responsibility," I review Wallace's involvement with major social issues, including anti-vaccination, socialism, and some others.

Chapter eight is something of a one-off, dealing with some further interests he had. Included are discussions of his views on life in the universe, economics, and conservation.

More than twenty years ago in my 1991 anthology I stated that reading Wallace is a challenge. This was a man who was both one of his generation's leading evolutionists, and leading spiritualists; at the same time, his social views make him something of a "socialist libertarian" (a pairing of words not often seen!). Some may say these things just cannot be, yet a reasonable evaluation seems to lead to the conclusion that his world view was to a large degree internally consistent. I believe we still have much to learn from him.

Further Reading

The interested reader may wish to take a look at the following for more information on Wallace:

Books

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

Marchant, James, ed., 1916. *Alfred Russel Wallace; Letters and Reminiscences*. New York: Harper & Brothers. [and in various reprints]

Raby, Peter, 2001. *Alfred Russel Wallace, A Life*. Princeton NJ: Princeton University Press.

Shermer, Michael, 2002. *In Darwin's Shadow: The Life and Science of Alfred Russel Wallace: A Biographical Study on the Psychology of History*. New York: Oxford University Press.

Slotten, Ross A., 2004. *The Heretic in Darwin's Court: The Life of Alfred Russel Wallace*. New York: Columbia University Press.

Smith, Charles H., ed., 1991. *Alfred Russel Wallace; An Anthology of His Shorter Writings*. Oxford, U.K.: Oxford University Press.

Smith, Charles H., ed., 2004. *Alfred Russel Wallace: Writings on Evolution, 1843-1912*. 3 vols. Bristol, U.K.: Thoemmes Continuum.

Smith, Charles H., & Beccaloni, George, eds., Nov. 2008. *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace*. Oxford, U.K.: Oxford University Press.

Wallace, Alfred Russel, 1905. *My Life; A Record of Events and Opinions*. 2 vols. London: Chapman & Hall. [and in various reprints]

Websites

Beccaloni, George, *The Alfred Russel Wallace Correspondence Project*.

Beccaloni, George, and the Alfred Russel Wallace Memorial Fund, *The Alfred Russel Wallace Website*.

Smith, Charles H., *The Alfred Russel Wallace Page*.

Smith, Charles H., *Alfred Russel Wallace: Evolution of an Evolutionist*.

Van Wyhe, John, *Wallace Online* (<http://wallace-online.org/>).

A Note

Just about all of the Wallace-written items referred to here can be found in transcribed full-text at *The Alfred Russel Wallace Page*.

Chapter One. Some Personal Matters

Although Wallace's long life is reasonably well documented at this point, there remain a number of unsettled questions about it. Some of these represent opposing points of view which may never fully be resolved, whereas others concern more specific details as to when or where he did this, or wrote that. Actually, some of the latter items were never really questions to begin with, just problems connected to conclusions based on incomplete information. In this opening chapter we shall look into some of these matters, focusing on recent updates.

“Lower Class” Wallace?

Among the more disparaging slights of Wallace one not infrequently sees is the idea that he was “lower class.” Such a characterization, of course, brings with it an avalanche of negative associations. It is true that Wallace had to leave school at the age of fourteen and had no further formal education; it is also true that his early years through that time, if not spent in actual poverty, were not always fully comfortable. But the brand “lower class” is most commonly applied to individuals and families of scant or no education or training, and nearly as often to misfits with histories of social irresponsibility or even unlawfulness. If one believes Wallace's recounting of his ancestors and relatives on both his mother's and father's side of the family, this latter appreciation does not seem apt.

In his autobiography Wallace does spend a fair amount of space going over his family's history, insofar as he was aware of it. It is apparent on reading this account that a goodly number of his relatives on both sides of the family had risen to positions of some power and/or renown. Most of his mother's only sister's family, the Wilsons,¹¹ emigrated to South Australia in 1838. There they were immediately successful, with the family patriarch,

¹¹ One of this line's modern representatives, John G. Wilson, wrote a biography of Wallace (*The Forgotten Naturalist: In Search of Alfred Russel Wallace*) published in 2000.

Thomas Wilson (1787–1863),¹² a lawyer, becoming the second mayor of Adelaide in 1842. Wilson was also a respected man of the arts and letters and a prominent amateur naturalist. So too on both counts was his son Charles Algernon Wilson (1818–1884). Wallace's mother, née Mary Anne Greenell, came from a family whose members had lived in the Hertford area since at least the 1570s, and many of them had reached positions of note. His mother's grandfather had been "for many years an alderman, and twice Mayor of Hertford (in 1773 and 1779)."¹³ Wallace notes that a considerable number of the Greenell clan are mentioned in a town history. Another Greenell, "of Marylebone" was an architect of some prominence.

Wallace knew less of his father's side of the family, but concluded his paternal grandfather may have kept an inn on an estate. One relative, James Wallace, who died in 1803, had been trained at the Royal Academy at Portsmouth and became an admiral in the navy. He saw service with Howe during the American Revolution, and was knighted in 1777. Wallace's father Thomas Vere (1771–1843), as mentioned in the Introduction, had the resources to pursue legal studies, and was "sworn in as an Attorney-at-Law of the Court of King's Bench" in 1792, though he apparently never practiced.

Wallace's siblings (at least the ones that lived reasonably long lives) also did well for themselves. Older brother William was running a successful business as a surveyor and builder when he died prematurely in 1845; he was apparently well enough regarded that he was asked to testify at hearings on related matters in London. Older brother John emigrated to California in 1849 and became a prominent surveyor and engineer there – a town was even named after him.¹⁴ Younger brother Herbert, who died of yellow fever in the Amazon in 1851, did not live long enough to develop a career. Wallace's sister Fanny was trained in France and for a few years taught school in England and the U. S. before marrying Thomas Sims, who became one of the first professional photographers in Britain, developing a considerable reputation there.

These of course represent only some of the more successful of the Wallace clan and their immediate relations, but there is enough here to argue that perhaps it would be fairer to view the line as "middle class" than as "lower class."

Wallace's Birthdate and the Origin of His Name

There has been some confusion over the years as to the date of Wallace's birth, and the origin of the spelling of his middle name, "Russel," with only one "l." Let's start with the birthdate.

One might think the birthdate issue a bit strange, but at that time (1823) there was no formal register of births, at least in Monmouthshire. Wallace himself thought for many years that he had been born in 1822, an error that found its way into a number of biographical reference works of the time. But the specific day has also been questioned, as follows.

¹² There is an entry on Wilson in the *Australian Dictionary of Biography*.

¹³ *My Life* 1905, vol. 1, p. 4.

¹⁴ Sal Manna, "A Brothers' Reunion: Evolution's Champion Alfred Russel Wallace and Forty-niner John Wallace." *California History* September 2008: 4–28.

Despite the lack of a civil registry, Wallace's birth was recorded in two sources: the Wallace family's prayer book, and the records of baptisms at St. Madoc's Church, in Llanbadoc, Wales. In the prayer book, his date of birth is given as 8 January 1823, and his half-baptism as 19 January. The parish register also gives his date of birth as 8 January 1823, and his full baptism as having taken place on 16 February. But Wallace biographer John Wilson has listed Wallace's birthdate as 18 January 1823. This turns out to be a double error on Wilson's part.

First, the date written in the parish register really is 8 January, but the "8" is written in a strangely ornate style that might easily be mistaken for "18" – and Wilson did. Wilson then compounded the error by mentioning in his biography that at the time Wallace discovered the 1822 error he wrote to his friend E. B. Poulton about it, saying how he had found that he really was born on 18 January 1823. But this is incorrect; I have traced that letter and confirmed that in it he gives the date as 8 January 1823.¹⁵ In any case the 8 January date makes more sense, as the half-baptism date of 19 January is too close to 18 January to suggest the latter as the real birthdate.

The name issue is a more complicated one, and not so easy to resolve. It has two interrelated components: (1) why the spelling "Russel," with only one "l"? and (2) when was this spelling assigned, right after birth, or possibly some time later?

In discussing the matter in his autobiography, Wallace writes: "Other friends or relatives of the Greenell family were named Russell and Pugh, and are buried at Hertford. A large gentleman's mourning ring in memory of Richard Russell, Esq., was given me by Miss Roberts, as I presume, the person after whom I was given my second name, though probably from an error in the register mine is always spelt with one *l*, and this peculiarity was impressed upon me in my childhood. . . . the precise relationship, if any, of the Russells to the Greenells I have not been able to ascertain."¹⁶ But the parish register gives his name quite clearly as "Russell." Meanwhile, the family prayer book lists him as "Russel," though it is obvious that originally another letter once followed the final "l," (ostensibly, another "l"), and has been erased.

As Wallace was made aware of the unusual spelling all the way back to his early youth, one suspects that the erasure was made early on. Perhaps the vicar at St. Madoc simply recorded the name as he heard it, assuming it was spelled in the usual way. But this doesn't explain the link to the Russell family in Hertford, if there was one. Nor does it explain why or when the erasure was made.

While investigating this I was informed that "Russell" as spoken aloud in Welsh would most likely have been written "Russel," since the "ll" combination in that language usually has a different pronunciation. Perhaps this is the key. Wallace's father was a man of letters and would have known this; maybe it was his intent to change the spelling of his son's name as a subtle reminder of his place of birth (none of the Wallaces' other children were born in Wales).

Wallace a Welshman?

¹⁵ Charles H. Smith *et al.*, "Alfred Russel Wallace Notes 2. The Spelling 'Russel', and Wallace's Date of Birth." *Archives of Natural History* 37, 2010: 167–169.

¹⁶ *My Life* 1905, vol. 1, p. 6.

Those who know Wallace's history will recall that there were three periods early in his life that included a strong connection to Wales. The Wallace family lived in Usk, Monmouthshire, from about 1820 to 1828 or 1829, during which period Wallace himself was born in 1823. The Wallaces had moved over from St. George's, Southwark, probably to reduce their living expenses. On neither his father's nor his mother's side had there been any previous connections with Wales, and after leaving in 1828/29 they never returned there as a family unit before 1843, the year of Thomas Vere's death.

The Usk area is in the hinterlands of Wales. Originally, the county had been known as Gwent, with cultural and political ties to Wales going back centuries. By the time of Wallace's birth, however, it had been called Monmouthshire for some years, a shift that included a loss of some administrative functions to English control. Most or all official business was being carried out in English, not Welsh.

In *My Life* Wallace has a few reminiscences about his early years in Wales, and not all of them are happy ones. The general impression one gets is that he and the rest of the family were not made to feel very welcome there. Apparently some of these feelings carried over to adulthood, as in an early essay from about 1843, written after Wallace had returned to the area to work for his brother, he has a lot of not-so-kind things to say about the rural Welsh. In later years, while writing much on the woes of the Irish and Scots, he would say relatively little about the Welsh, despite his greater personal experience of the conditions there.

Wallace did go back to Wales to work for two extended periods, 1840–1843 and 1845–1848, but both episodes were connected to his brother's business. In later years he would visit Wales only on vacation or to attend meetings or give papers. He certainly did not consider himself a Welshman; I am unaware of any of his writings in which he refers to himself as such. Conversely, he frequently calls himself an Englishman.¹⁷ The final item of note is that late in life he *declined* the offer of an honorary doctorate from the University of Wales (after some years earlier accepting ones from Dublin and Oxford!) – hardly the act of a person feeling strong ties to the region.

Now none of this has anything to do with the admitted fact that Wallace's experiences in Wales as a young man were important to his overall intellectual development. It was here he first seriously took up natural history collecting, learned important lessons about land tenure, became involved as a thinker, lecturer and curator at local mechanics institutes, libraries, and museums, and refined many intellectual skills he would put to good use later. Still, this is not the same thing as claiming Welsh national citizenship for him, as many sources have in recent years. The scorecard: It seems Wallace might reasonably be considered "Welsh" were any of the following true: (1) one or both of his parents had any substantial and reasonably recent Welsh heritage (2) Wallace had grown

¹⁷ On my website I note the following examples: "... had never been visited by an English collector ..." (speaking of himself, *My Life* 1905, vol. 1, p. 357); "... I was the only Englishman who had lived some ..." (*My Life* 1905, vol. 2, p. 34); "... he's an Englishman, lecturing on biology and Darwin ..." (speaking of someone talking about him, *My Life* 1905, vol. 2, p. 122); "... What most impresses the nature-loving Englishman while travelling in America ..." (speaking of himself, in "English and American Flowers," *Fortnightly Review* 1 October 1891: 532; "... I believe I am the only Englishman who has ever shot and skinned ..." (*Proceedings of the Entomological Society of London 1856–1857*: 93); and "... I claim for every Englishman a share in this great property, devoted by *our* ancestors to ..." (from an interview published in 1886 – note the "our," with my italics, *The Sunday Herald* (Boston) 31 October 1886: 13).

to adulthood there (*i.e.*, without moving back to England for over ten years first, starting at the age of five (or possibly six) (3) his parents had remained in Wales permanently instead of moving back to England (4) Wallace had *voluntarily* moved back to Wales during his teen years or adulthood (as opposed to being first dragged along by his brother William, or later cleaning up his brother's affairs after he died) and then remained there (5) Wallace had settled in Wales permanently after his return from the Malay Archipelago in 1862, or even from the Amazon in 1854 (6) Wallace had referred to himself as a Welshman (7) and perhaps, even, had Gwent always been unambiguously Welsh and continuously referred to by that name. However, none of these *are* true. I have suggested he might most aptly be considered "an Englishman born in Wales."

Wallace's Early Writings

For many years after his death it was thought that Wallace's first publication was a one-line note on distribution that appeared in the April 1847 issue of *Zoologist*, a London journal. A couple of years later, while he was already in South America, some of his correspondence on collecting was printed in the *Annals and Magazine of Natural History*. It turns out, however, that he was rather more active as a writer during the 1840s than just these items. Some of this was already known; in *My Life* Wallace printed two essays that were written around 1843 but weren't published at the time. Beyond these efforts, however, there was another writing of considerable interest that didn't reach print until just recently.

In the late 1830s and early 1840s, while working as a surveyor for his brother William, Wallace was also attending local scientific meetings, and keeping up with new developments in subjects such as astronomy and photography. In 1843, and rather precociously, he came up with a theory of how to build telescope reflecting mirrors using a process involving mercury, and sent a short write-up on the subject to the most prominent photographer in England, Fox Talbot. There is no evidence Talbot ever wrote back, and whether anything came of the idea at that time is uncertain,¹⁸ but it is clear that self-educated or not, Wallace was already thinking at an advanced level. Some persons around him must have noticed his abilities; this is probably why a couple of years earlier he had been asked to contribute an essay on mechanics institutes to a local history. It eventually appeared in print sometime in 1845, possibly his earliest actual publication. But that same year he also published a letter to the Editor concerning experiments on mesmerism he had undertaken while working as an instructor in Leicester. A year later, in 1846, he co-wrote a letter that found its way into the official record of public petitions to the House of Commons. The subject there was the repeal of an outdated law on sedition; the problem was that if taken literally it might have been used to close public meeting places such as those found in the new free libraries. Then, in early 1848, shortly after his sister Fanny had returned from teaching assignments in Alabama and Georgia, he published a letter to the Editor concerning the opportunities afforded emigrants to the southern United States.

The range of subjects involved in these early writings is perhaps not unexpected, given what we know of his later career. It will be worthwhile in the future to continue searching for Wallace writings from the 1840s. At present, electronic text coverage of the serial and

¹⁸ Charles H. Smith, "Reflections on Wallace." *Nature* 7 September 2006: 33–34.

newspaper literature from this period is very uneven, and there well may be some additional surprises in store.

Was Wallace “Poor” After His Return to England in 1862?

Wallace is often distinguished from Darwin simply on the basis of the latter’s wealth. It is true that Darwin was, relatively speaking, quite wealthy – he was never forced to earn a living, and owned a sizeable estate (though his lifestyle was fairly modest, and he did not flaunt his wealth). But what about Wallace? Was he really so poor that this matter should be brought up?

Growing up, Wallace and his family certainly were not well off, but it appears that even so the family never found it necessary to do without servant help. In those days, of course, such help was quite inexpensive, but one could argue that the mere fact of being able to keep *any* servants removes one from the register of the poverty-stricken. As a young man Wallace kept himself reasonably well employed, though there is no indication that he ever had much if any money to spare. He may well have never found his way to the East had it not been for a travel grant engineered through the Royal Geographical Society. His collecting activities there were rewarding, but much of the returns gained while he was in the field had to be reinvested in equipment and travel expenses.

At the point of Wallace’s return to England in 1862, things were looking up. His collections had made him a good profit, and his objective of retiring to a comfortable home in the country seemed obtainable. After marrying in 1866 he started to look around for a house suited to his needs, and began a series of moves that would lead him farther and farther away from London. But at the same time much of his money was lost in bad investments. Further, he was unable to find full-time employment. The best he could manage were irregular sources of income, the main ones being lecture and writing opportunities, editing other writers’ (for example Lyell) productions, and correcting state-administered exams.

All of this left Wallace just a few steps away from ruin for the rest of his life. But he was famous, and despite his claims industrious when he needed to be, and there is reason to believe he got along decently. He was able to build three new houses; his last one, constructed in Dorset in 1902, was good-sized, and in his later years he had enough money to keep a gardener. The Calendars of the Grants of Probates and Letters of Administration reported his net worth at £5823 after he died in 1913.¹⁹ But there was not enough money remaining to support his widow, and the house at Broadstone had to be sold to provide for her in her final year (she died in 1914).

So, it depends on how you look at it. Certainly, Wallace was not in Darwin’s league when it came to wealth, but probably the majority of people living in England at that time would have been happy to have his resources.

How Famous Was Wallace in His Later Years?

¹⁹ This figure appeared as additional matter to the *Oxford Dictionary of National Biography* entry I wrote in 2004, but a smaller figure, 2884 pounds, deemed “net personality,” was reported in a number of newspaper articles shortly after Wallace’s death.

Today Wallace falls outside the rank of the top names in the history of science, and yet he is pretty well known, certainly at least to professional naturalists, most scientists in general, and a nontrivial portion of the educated public. Still, there have sometimes been efforts to marginalize his name, perhaps under the impression that he was never very well known anyway. This is not the case.

Over the years I have had opportunity to see hundreds of mentions of Wallace's name that appeared in his own time, especially in connection with speaking engagements, book reviews, miscellaneous stories in newspapers, and obituaries.²⁰ It is clear from these that from about the mid-1880s he was considered the greatest naturalist in the world (Darwin had died in 1882), and from about 1900 on, one of the greatest, if not *the* greatest, scientist in the world. In fact his was probably one of the most recognized names overall; one of his obituaries (from *Current Opinion*) proclaimed: "Only a great ruler could have been accorded by the press of the world any such elaborate obituary recognition as was evoked by the death of Alfred Russel Wallace." In his later years he was referred to on numerous occasions as the "Grand Old Man of Science."

The reasons for this growing fame are fairly apparent. First, with the death of Darwin he became the living person most associated with the theory of natural selection, probably the most famous and discussed idea in science. Second, he frequently wrote, not only on this subject, but on a wide range of science and society-related topics, and usually in an easily understandable way. And, not only did he write, but he always took sides with the ordinary person, who soon came to view him as their friend.

Moreover, while it is true that many figures within the world of science came to distrust him for his support of subjects like spiritualism, anti-vaccinationism, and socialism, when it came to one-on-one combat within the world of scientific discourse, his powers of marshaling evidence and logical argumentation were second to none, and his adversaries knew it. Wallace maintained a solid body of support within the scientific community, even from most of those more conservative elements whose powers of invention were less than his own.

The Natural History Cabinet Recently Attributed to Wallace

One of the most interesting Wallace-related stories of recent years concerns the discovery of what some think to be one of Wallace's personal natural history cabinets. In 1979 a young Washington D.C. lawyer named Robert Heggestad purchased a nineteenth century natural history cabinet containing over fifteen hundred specimens, mostly of insects. The cabinet had been bought in 1964 at an unclaimed baggage sale, then resold at auction in 1973. Heggestad paid six hundred dollars for the attractive rosewood structure, already linked to Wallace, but he knew nothing about him and put it away for nearly thirty-five years. Around 2007 he began to research the matter, seeking help from experts, and in 2009 announced his find.

The story was well publicized around the world. Heggestad had made no progress on the provenance of the collection, but sources in the Smithsonian and American Museum of Natural History were willing to support him in his belief that this was a Wallace artifact. Handwriting analysis seemed to confirm that it was Wallace's words that were written on

²⁰ For some of the latter, see: <http://people.wku.edu/charles.smith/wallace/obits.htm>

many of the pins that held the specimens in place, and many of the specimens were of species Wallace was known to have collected. Heggstad has since displayed the cabinet at the American Museum of Natural History and elsewhere.

There are a few problems with this story, however. The individuals who are most familiar with Wallace's collected materials are in England, and have not examined this collection in detail. Still, and even without close examination, some loose ends are apparent. For one, the specimen pins are tagged with labels that Wallace was not known to have used. Further, Wallace's name appears nowhere in the entire collection. Also, and possibly significantly, many of species represented come from places Wallace did not collect in. And there is still the lingering question of the provenance between the mid-1850s and 1964.

Some of the specimens are from continental Europe, and Heggstad has suggested that Wallace may have visited there at some point before he turned professional as a collector. But Wallace mentions no such trip in his autobiography, or anywhere else, and in his early years Wallace didn't have the funds to go traipsing around Europe on his own. Actually, this (and additional specimens from parts of Brazil Wallace did not visit) is not a major problem, as natural history collectors often purchase or trade for materials they themselves cannot capture, and Wallace himself is known to have done this on various occasions. But there are further considerations.

Even if some, most, or all of the specimens were collected by Wallace, it is entirely possible that they were put together by a second party who had purchased them from Wallace's collections agent, from Wallace himself, or from a third party later. These may have been individuals, or corporate entities such as natural history museums. It is also possible that a collection was put together that deliberately mimicked Wallace's collecting – and not even as a hoax, as Wallace was much admired and it is not unlikely that an amateur might have created such a collection as a show of respect for him.

In any case, it is not difficult to imagine how the cabinet, whether believed to be Wallace's or not, could have found its way from Britain to the United States. It could have been traded for, donated, or bought at auction after someone's death, or simply to raise money. The item is not so large that being shipped across the ocean would have been that difficult. But let us suppose for a moment this cabinet actually did belong to Wallace, and contained materials he had either collected himself, or traded for. What might have happened to it?

I have a couple of theories. One is that he may have brought it along with him – or had it shipped separately – when he started his lecture tour in Boston in 1886, and then somewhere along the way either lost it, or sold it, or gave it away. But there is no indication of this in the fairly detailed journal he kept of the ten month trip.

Another possibility is that the cabinet is an expansion of specimens Wallace used to help Lewis Weston Dillwyn update his insect species list for the publication *Materials for a Fauna and Flora of Swansea and Neighbourhood* in 1848. R. Elwyn Hughes²¹ discusses this, including a letter from Dillwyn to Wallace that ends: "I am glad to learn that your valuable collection [of Coleoptera] will remain at Neath and trust it will be accompanied by

²¹ "Alfred Russel Wallace; Some Notes on the Welsh Connection." *British Journal for the History of Science* 22, 1989: 401–418, on pp. 411–412.

a Catalogue with the particular Habitats of the Welsh Rariores.” Hughes then quotes words from Dillwyn’s *Materials...* : “I have been favoured by Mr. Alfred Wallace with the following list of Coleoptera which he has added to the Catalogue I printed in 1829, and which are now placed in the Museum at Neath.” Hughes continues:

The fate of Wallace’s Coleoptera collection is unknown. It is obvious from Dillwyn’s letter that it had been deposited at Neath Museum and it would appear that Wallace’s mother (with whom Wallace had lived at Neath) later transferred the collection to Dillwyn’s son Lewis Llewelyn Dillwyn when she left Neath some two years after Wallace’s departure [for Brazil in 1848]. Over ten years later Wallace seemingly requested the return of his collection. Lewis Weston Dillwyn had died in 1855 and Wallace received a somewhat nebulous reply from Dillwyn (junior), a Welsh political radical with only a fraction of his father’s interest in natural history . . . Fifteen years later Dillwyn supported Wallace in his (unsuccessful) application for post of Superintendent of Epping Forest; whether he had in the meantime returned Wallace his insect collection is not known.

Perhaps Dillwyn never did return it, and over the span of many years added more specimens to it. Some indication of this might be obtained by matching up the list in the 1848 work with the specimens in the cabinet.

Another possibly relevant clue comes from a talk Wallace gave to the Croydon Microscopical and Natural History Club at their meeting of 17 March 1880. A synopsis exists of this talk, which includes:

Mr. Wallace exhibited a case of Butterflies and Moths, lent to him by Mr. Charles Stevens, containing, amongst others, the large Copper Butterfly (*P. hippothoe*), formerly abundant in some parts of Great Britain, but believed now to be extinct, and pointed out in it and described some of the unique specimens to which he had referred. He also exhibited a case of Butterflies and Moths taken in the Isle of Man, and with them a series of the specimens most nearly resembling them which are to be found in the other British islands, and the peculiarities of each were pointed out and described.²²

Again, the contents of the current collection might be relatable to the ones mentioned above.

The ultimate problem with this story is that now that Heggstad and his supporters have bought into the idea that this really is a “Wallace cabinet” and it has been publicly represented as such, its auction worth has skyrocketed to at least several hundred thousand dollars. The reader may imagine the difficulties facing any disbeliever at this point, and any attempt to show that it might not represent what some say it is.

Chapter Two. How Wallace Came to Natural Selection: Final Causes Part One

One of the most common mistakes made by Wallace historians is the tacit assumption that he came to the theory of natural selection fairly directly, through his early reading of Thomas Malthus combined with the thinking featured in his 1855 essay “On the Law Which Has Regulated the Introduction of New Species,” written while he was staying in Sarawak. The real story is a good deal more complicated than that, I think, involving some interesting turns, and a much longer cast of characters. We should start, of course, at the beginning.

²² “On the Peculiar Species of the British Fauna and Flora.” *Proceedings and Transactions of the Croydon Microscopical and Natural History Club from February 20th, 1878, to January 19th, 1881*: 58–60, on p. 59.

Evolution in the Air

It goes without saying that although Darwin and Wallace are identified with outlining the first credible process model for organic evolution, evolution as a concept had been around for a long time before either man was born. By the eighteenth century some thinkers were getting up the courage, even if often only between the lines, to allude to the possibility of organic change, and some, including the Comte de Buffon (1707–1788), were even suggesting that the driving mechanism might somehow be linked to environmental forces, especially climate. Even earlier, Pierre Louis Maupertuis (1698–1759) had made some of the first extended studies on heredity and concluded that actual derivations of one species from another had occurred, but he was unable to suggest how it might have happened. Darwin's grandfather, Erasmus Darwin (1731–1802), a close student of natural history (especially of the habits and characteristics of living things) also advocated a process of what was then termed “transmutation,” but he too could suggest no mechanism beyond a mild appeal to the transmission of acquired characters from one generation to the next.

These early figures (and of course there were others as well) were working at a disadvantage, on several levels. Apart from widespread religious prejudices on the subject, the meaning of fossils on the one hand, and the present distribution of species on the other, was not understood. Dissenters argued that fossil creatures might still have living representatives that persisted in yet-unexplored regions. The rock record, meanwhile, was interpreted by most as giving evidence of major cataclysmic events in the past – events so extreme as to suggest that there may have been multiple Creations over time.

By the end of the eighteenth century and beginning of the nineteenth, perceptible improvements in the knowledge base were leading to new conclusions. To begin with, it was becoming clear that the fossil record contained evidence of creatures that really no longer were around. Field-based findings, meanwhile, were starting to do in the old geological catastrophism in favor of a new model set out by the Scotsman James Hutton (1726–1797), uniformitarianism, which advocated deep time and an eternal operation of slowly-acting forces. An engineer and surveyor, William Smith (1769–1839), working throughout England, noticed that similar fossils were found in analogous strata at different locations, thus founding the science of biostratigraphy and the technique of age-dating through correlation of similar units. This would eventually allow paleontologists to get past the theories of Georges Cuvier (1769–1832), who supported a new form of catastrophism, and to relate and classify forms as Linnaeus had living forms a century before.

Some of these men and their contemporaries were transmutationists and some weren't, but the only one who advanced a much-discussed process model to explain organic change was the French zoologist Jean Baptiste de Lamarck (1744–1829). Lamarck was a believer in the continuing spontaneous generation of lower creatures, but thought that higher organisms, in “striving” to meet the conditions of their existence, were able to pass along such improvements in their individual constitutions to their progeny. This was not a conscious “striving,” however, just the natural result of effort. Lamarck could provide no convincing evidence that such a process actually takes place, much less specifically how. He found relatively few sympathizers.

Nevertheless, some who understood the fossil record and had some sense of the diversity of life were now supporters of the transmutation theory. Additionally, there was increasing evidence from the practices of artificial breeding: if domestic species could be altered from generation to generation, then an analogous natural process might exist. The race was now on to suggest exactly how it happened.

Charles Darwin (1809–1882) was one of the early investigators to work out the process model we now call natural selection. His first grasp of the concept came in the late 1830s as he pondered the results of his world travels of a few years earlier. But others had already preceded him. In 1813 an American physician living in England, William Wells (1757–1817), presented a paper before the Royal Society of London dealing with the origin of skin colors in the human races; it clearly anticipated Darwin's work, but apparently no one took notice of it. Some years later (in 1831) another anticipation was published by a man named Patrick Matthew (1790–1874) as part of his book *On Naval Timber and Arboriculture*. Darwin later wrote to Wallace how Matthew "gives *most clearly* but very briefly . . . our view of Natural Selection."²³ Again, however, at the time no one took notice. A third writer, Edward Blyth (1810–1873) also chipped in with a series of proto-natural selection papers published in the *Magazine of Natural History* in the mid-1830s. One more time, no reaction.²⁴

By the 1840s the subject was still under discussion, though it is not clear just how much momentum it had. This changed when in 1844 the Scottish publisher Robert Chambers (1802–1871) anonymously came out with a popular treatment of transmutation called *Vestiges of the Natural History of Creation*. Well-written and provocative, it caused quite a stir within both popular and scientific circles, though again the author was unable to outline a mechanism that could explain the inner workings of the process. Many within the scientific community discounted it on this basis. It was another eleven years before the next major event in the story took place.

That event was the writing and publication of Wallace's "On the Law Which Has Regulated the Introduction of New Species." But before proceeding in that direction, let us ask ourselves whether Wallace might have been aware of any writings by the earlier-mentioned figures before 1854. The answer seems to be that, with the exception of *Vestiges*, he was either unaware of them, or if he was, they had made relatively little impression. He neither mentions in his pre-1854 writings, nor later discusses how he had gone over them at the time, Buffon, Maupertuis, Erasmus Darwin, Hutton, Cuvier, Lamarck, or Smith.²⁵ Neither was he aware of Wells, Matthew, or Blyth. The only important Darwin work he knew was his *Journal of Researches*, which does not have much to say that is transmutationist.

Despite his lack of academic training, Wallace was doing a lot of reading in the 1840s, but it wasn't of materials written by these evolutionary progenitors. What it was he was reading we will get to, but for the moment we need to speak of an even earlier influence on his thinking.

²³ James Marchant, ed., *Alfred Russel Wallace: Letters and Reminiscences*. Harper & Brothers, 1916, on p. 118.

²⁴ Blyth, however, was one of the first to recognize the importance of Wallace's 1855 Sarawak essay, and to write to Darwin about it.

²⁵ By the time of his 1858 essay Wallace was aware of Lamarck, but probably through the writings of Charles Lyell. In any case, Wallace never was a follower of Lamarck's theories.

Wallace and Owenism

It will be remembered that in late 1836, perhaps after the Christmas of that year, Wallace was forced to go to London to live with his older brother John, then about eighteen, who had been apprenticed to a builder. A few years earlier an unsuccessful attempt had been made by the Scotsman Robert Owen (1771–1858) to unionize all the trades, and John was friendly with a number of the effort's supporters. During Wallace's several months in London he and his brother spent many of their evenings at a nearby Owenite meeting place, where Wallace heard many lectures and discussions on the movement's favorite themes, including secularist utopian visions of resettling the poor into communistic "co-operative communities" in rural areas. On one occasion Owen himself apparently spoke. Wallace was impressed, especially after he consumed some of Owen's own writings, through which he learned of his humanitarian organizing efforts at New Lanark, one such community.

He was apparently also impressed with the writings of Tom Paine, and even more so Owen's son, Robert Dale (1801–1877), especially his tract *Consistency*. In this work the younger Owen set out an argument against the religious notion of eternal punishment which Wallace found entirely convincing; he "thoroughly agreed with Mr. Dale Owen's conclusion, that the orthodox religion of the day was degrading and hideous, and that the only true and wholly beneficial religion was that which inculcated the service of humanity, and whose only dogma was the brotherhood of man."²⁶ He would also later write:

. . . my introduction to advanced political views, founded on the philosophy of human nature, was due to the writings and teachings of Robert Owen and some of his disciples. His great fundamental principle, on which all his teaching and all his practice were founded, was that the character of every individual is formed *for* and not *by* himself, first by heredity, which gives him his natural disposition with all its powers and tendencies, its good and bad qualities; and, secondly, by environment, including education and surroundings from earliest infancy, which always modifies the original character for better or for worse. Of course, this was a theory of pure determinism, and was wholly opposed to the ordinary views, both of religious teachers and of governments, that, whatever the natural character, whatever the environment during childhood and youth, whatever the direct teaching, all men *could* be good if they liked, all *could* act virtuously, all *could* obey the laws, and if they wilfully transgressed any of these laws or customs of their rulers and teachers, the only way to deal with them was to punish them, again and again, under the idea that they could thus be *deterred* from future transgression. The utter failure of this doctrine, which has been followed in practice during the whole period of human history, seems to have produced hardly any effect on our systems of criminal law or of general education; and though other writers have exposed the error, and are still exposing it, yet no one saw so clearly as Owen how to put his views into practice; no one, perhaps, in private life has ever had such opportunities of carrying out his principles; no one has ever shown so much ingenuity, so much insight into character, so much organizing power; and no one has ever produced such striking results in the face of enormous difficulties as he produced during the twenty-six years of his management of New Lanark.²⁷

²⁶ *My Life*, new ed. (Chapman & Hall, 1908), p. 46.

²⁷ *My Life*, new ed. (Chapman & Hall, 1908), pp. 46–47.

This was Wallace's first, and arguably most influential, life lesson. Not only did it spell an end to any conventional religious views he may have held, but it also gave him a whole new view on causality:

Owen contended, and proved by a grand experiment, that environment greatly modifies character, that no character is so bad that it may not be greatly improved by a really good environment acting upon it from early infancy, and that society has the power of creating such an environment. Now, the will is undoubtedly a function of the character of which it is the active and outward expression; and if the character is enormously improved, the will, resulting in actions whether mental or physical, is necessarily improved with it. To urge that the will is, and remains through life, absolutely uninfluenced by character, environment or education; or to claim, on the other hand, that it is wholly and absolutely determined by them – seem to me to be propositions which are alike essentially unthinkable and also entirely opposed to experience. To my mind both factors necessarily enter into the determination of conduct as well as into the development of character, and, for the purposes of social life and happiness, a partial determinism, as developed and practised by Owen, is the only safe guide to action, because over it alone have we almost complete control. Heredity, through which it is now known that ancestral characteristics are continually reappearing, gives that infinite diversity of character which is the very salt of social life; by environment, including education, we can so modify and improve that character as to bring it into harmony with the possessor's actual surroundings, and thus fit him for performing some useful and enjoyable function in the great social organism.²⁸

It was thus through will and determination, and not through any appeal to first causes, that we could improve our lots in life. Wallace's secularization is evident in one of his first writings (*circa* 1843), an essay/lecture he called "The Advantages of Varied Knowledge," in which he pleads:

Can we believe that we are fulfilling the purpose of our existence while so many of the wonders and beauties of the creation remain unnoticed around us? While so much of the mystery which man has been able to penetrate, however imperfectly, is still all dark to us? While so many of the laws which govern the universe and which influence our lives are, by us, unknown and uncared for? And this not because we want the power, but the will, to acquaint ourselves with them. Can we think it right that, with the key to so much that we ought to know, and that we should be the better for knowing, in our possession, we seek not to open the door, but allow this great store of mental wealth to lie unused, producing no return to us, while our highest powers and capacities rust for want of use? Is it not fitting that, as intellectual beings with such high powers, we should each of us acquire a knowledge of what past generations have taught us, so that, should the opportunity occur, we may be able to add somewhat, however small, to the fund of instruction for posterity? Shall we not then feel the satisfaction of having done all in our power to improve by culture those higher faculties that distinguish us from the brutes, that none of the talents with which we may have been gifted have been suffered to lie altogether idle? And, lastly, can any reflecting mind have a doubt that, by improving to the utmost the nobler faculties of our nature in this world, we shall be the better fitted to enter upon and enjoy whatever new state of being the future may have in store for us?²⁹

A similar theme can be observed in an essay he wrote around 1841 that found its way into a town history in 1845:

²⁸ *My Life* 1905, vol. 1, pp. 90–91.

²⁹ *My Life* 1905, vol. 1, pp. 203–204.

All have doubtless heard how the celebrated Dr. Herschell was, in his youth, a musician in a foreign military band – but think you not that the love of knowledge must have been most powerful in him whose name is now known in every corner of the civilized world? – think you, that he who has added the knowledge of worlds to our own system, and penetrated further than the mind can conceive into the regions of space, – and whose intellect enabled him, from every appearance of those innumerable worlds, to add immensely to our knowledge of the structure of the mighty universe, and point out the great changes which for millions of ages it has undergone, could have done this without the desire and the means of acquiring information in his youth?³⁰

Around the same time Wallace crafted an essay on Welsh farmers, in which the notion of self-improvement is extended to a prescription for societal advance:

[The South-Wales farmers'] system of farming is as poor as the land they cultivate. In it we see all the results of carelessness, prejudice, and complete ignorance. We see the principle of doing as well as those who went before them, and no better, in full operation; the good old system which teaches us not to suppose ourselves capable of improving on the wisdom of our forefathers, and which has made the early polished nations of the East so inferior in every respect to us, whose reclamation from barbarism is ephemeral compared with their long period of almost stationary civilization. The Welshman, when you recommend any improvement in his operations, will tell you, like the Chinaman, that it is an "old custom," and that what did for his forefathers is good enough for him.³¹

Thus Wallace's earliest intellectual travels had taken him down a route of social and individual progressivism. In the mid- and late-1840s he would encounter the writings of several figures whose ideas would help him turn this progressivism in the direction of natural science subjects.

New Influences: Humboldt, Liebig, Davy, Lyell, and Chambers ³²

Although it is well known that Wallace's decision to go to the Amazon was in the immediate sense influenced by the publication of W. H. Edwards' book *A Voyage up the River Amazon* in 1847 (and a chance meeting of the author soon after), in the larger sense his appetite for travel was probably most fueled by three individuals. Two, Charles Darwin and Alexander von Humboldt, had written highly successful accounts of their own natural history-related travels that would inspire many other naturalists besides Wallace. The third person was, perhaps surprisingly, his older sister Frances (Fanny). Fanny, eleven years Wallace's senior (and his only surviving sister), had been the one member of the immediate Wallace clan who, after a good basic education including study in France, had really struck out on her own. Accepting an invitation to teach in the United States, she had spent several years at schools in Georgia and Alabama, returning in September 1847.

³⁰ "An Essay, On the Best Method of Conducting the Kington Mechanic's Institution." In *The History of Kington* ed. by Richard Parry (n.p., 1845): 66–70, on pp. 69–70.

³¹ *My Life* 1905, vol. 1, p. 207.

³² Alexander von Humboldt's *Personal Narrative of Travels to the Equinoctial Regions of the New Continent*, Baron Justus von Liebig's *Chemistry in Its Application to Agriculture and Physiology*, Sir Humphrey Davy's *Elements of Agricultural Chemistry*, Charles Lyell's *Principles of Geology*, and Robert Chambers's *Vestiges of the Natural History of Creation*.

Wallace loved his sister, and must have regarded her as something of a role model. If she could go off and succeed in the New World, why couldn't he?

Still, it was Edwards, Darwin, Lyell, and Humboldt who Wallace most pointed to later, and perhaps this was not entirely unfair. Edwards and Darwin shared with Wallace a love of living things, especially of insects, and of systematizing them, and Lyell and Humboldt promoted models of universal change and organization, which most caught Wallace's attention as a foundation for further thinking.

Wallace later described how important Lyell's writings were to him in his early years:

. . . having also read through . . . books . . . giving a mass of facts as to the distribution of animals over the whole world, it occurred to me that these facts had never been properly utilized as indications of the way in which species had come into existence. The great work of Lyell had furnished me with the main features of the succession of species in time, and by combining the two I thought that some valuable conclusions might be reached. I accordingly put my facts and ideas on paper, and the result seeming to me to be of some importance, I sent it to *The Annals and Magazine of Natural History*, in which it appeared in the following September.³³

. . . I had read, and been even more deeply impressed by, Sir Charles Lyell's immortal 'Principles of Geology,' which had taught me that the inorganic world – the whole surface of the earth, its seas and lands, its mountains and valleys, its rivers and lakes, and every detail of its climatic conditions, were and always had been in a continual state of slow modification. Hence it became obvious that the forms of life must have become continually adjusted to these changed conditions in order to survive. The succession of fossil remains throughout the whole geological series of rocks is the record of this change; and it became easy to see that the extreme slowness of these changes was such as to allow ample opportunity for the continuous automatic adjustment of the organic to the inorganic world, as well as of each organism to every other organism in the same area, by the simple processes of 'variation and survival of the fittest.' Thus was the fundamental idea of the 'origin of species' logically formulated from the consideration of a series of well-ascertained facts.³⁴

Wallace would eventually take issue with Lyell's biogeographical models, but the latter's geological uniformitarianism would remain a fundamental influence on him for many years.

Two further early influences on Wallace's thought have remained unnoticed. These were Sir Humphry Davy, and Justus von Liebig. Wallace mentions them a few times in his later writings, notably: "Living thus almost constantly on the land and among farmers and country people, I soon took a great interest in agriculture. I studied the works of Sir Humphrey Davy and Baron Liebig, at that time the great authorities on agricultural chemistry. . . . I really believe that at that period of my life I could have passed a very fair examination in theoretical and practical agriculture."³⁵ "I have already described how I

³³ *My Life* 1905, vol. 1, p. 355.

³⁴ "Notes on the Passages of Malthus's 'Principles of Population' which Suggested the Idea of Natural Selection to Darwin and Myself." In *The Darwin-Wallace Celebration* (Burlington House, 1909): 111–118, on p. 118.

³⁵ "President's Address." In *Report of the Land Nationalisation Society. 1884–5*. (Land Nationalisation Society, 1885): 5–15, on p. 15.

came to take some interest in agriculture while surveying in Bedfordshire, and the adjacent counties, and this interest was increased by a careful study of Sir Humphry Davy's 'Lectures on Agricultural Chemistry,' which I met with soon afterwards."³⁶ While Davy's book may have provided Wallace with early lessons on how to carry out experimental science, Liebig's work (probably *Organic Chemistry in its Applications to Agriculture and Physiology*, which, though originally published in German, was available in English by 1840) perhaps proved a more pervasive influence. Liebig is famous for having introduced the "law of the minimum," the observation that agricultural yield is directly dependent on the least available critical nutrient, whatever that may happen to be in a particular case. The limiting factor concept was an important contributor to the development of ecological theory over the next hundred years, and it is difficult to believe that Wallace was not swayed by its logic, at least in his early years. Certainly it must have been at the back of his mind all those years before he hit upon natural selection, which, as we will see, shifted his focus from large-scale geographical and ecological controls on evolution to the direct selection of adaptive suites.

We have not yet said much about Humboldt. Alexander von Humboldt, one of the founders of the science of physical geography, had undertaken a famous natural history collecting expedition to Latin America from 1799 to 1804. He was regarded as the world's greatest philosopher of natural science in the early decades of the twentieth century, and it is obvious that Wallace held him in high esteem.³⁷ In several places Wallace mentions how Humboldt's *Personal Narrative of Travels in South America* was one of the works that most enticed him to travel to South America; he also mentions another publication of Humboldt's, *Aspects of Nature*, in his *Narrative of Travels on the Amazon and Rio Negro*. In *My Life*, Wallace dates his acquaintance with *Personal Narrative* from the time of his stay at Leicester. But it is a third work of Humboldt's that may have most influenced his philosophical position: *Cosmos*. In a late interview Wallace says: "I had been greatly influenced in selecting this work by reading tales of travel, particularly Humboldt's 'Cosmos,' and stories of that great explorer's personal travels."³⁸ Wallace may be remembering the wrong book here, but Elwyn Hughes observes that in a 28 December 1845 letter to Bates Wallace notes how he has a "great desire" to read this work, and how a library catalogue at the Neath Philosophical and Antiquarian Society (with which Wallace was associated) indicates a copy of the book was purchased for it sometime before 1852 (and through other evidence presumably after the 1845 letter), quite possibly by Wallace. There is thus a very good chance that Wallace got to read the work before he left for South America.³⁹

It may very well be from Humboldt (and secondarily Lyell) that Wallace developed his views on environment-mediated biological change. In the Preface and Introduction to the

³⁶ *My Life* 1905, vol. 1, p. 204.

³⁷ In his earliest known writing, Wallace recommends that Humboldt's *Personal Narrative* be included as a key title in the libraries of mechanics institutes. Wallace 1845 *op. cit.*, p. 68.

³⁸ *New York Times* 8 October 1911: 8.

³⁹ R. Elwyn Hughes, "Alfred Russel Wallace; Some Notes on the Welsh Connection." *British Journal for the History of Science* 22, 1989: 401–418, on p. 410. In any case, Wallace eventually read the book, as he quoted words from it in 1871: that "a presumptuous skepticism, which rejects facts without examination of their truth, is, in some respects, more injurious than an unquestioning incredulity" ("On the Attitude of Men of Science Towards the Investigators of Spiritualism." In *The Year-book of Spiritualism for 1871* ed. by Hudson Tuttle and J. M. Peebles (William White & Co., 1871): 28–31, on p. 30.)

first volume of *Cosmos*⁴⁰ Humboldt delivers a series of remarks that sound, as we will see later, very much like early Wallace. There are six or seven passages that pertain, but we will limit ourselves to three:

...the actual object of my studies has nevertheless been of a higher character. The principal impulse by which I was directed was the earnest endeavor to comprehend the phenomena of physical objects in their general connection, and to represent nature as one great whole, novel and animated by internal forces (p. vii).

General views lead us habitually to consider each organism as a part of the entire creation, and to recognize in the plant or the animal, not merely an isolated species, but a form linked in the chain of being to other forms either living or extinct. They aid us in comprehending the relations that exist between the most recent discoveries and those which have prepared the way for them (p. 22).

The ultimate aim of physical geography is, however, as we have already said, to recognize unity in the vast diversity of phenomena, and by the exercise of thought and the combination of observations, to discern the constancy of phenomena in the midst of apparent changes. In the exposition of the terrestrial portion of the *Cosmos*, it will occasionally be necessary to descend to very special facts; but this will only be in order to recall the connection existing between the actual distribution of organic beings over the globe, and the laws of ideal classification by natural families, analogy of internal organization, and progressive evolution (p. 43).

On the basis of some of his correspondence with Bates, it appears Wallace encountered the anonymously-written *Vestiges of the Natural History of Creation* before he read *Cosmos*, and the dynamic created by this order is an interesting one to consider. *Vestiges* was first published in 1844. The first volumes of *Cosmos* came out in German the same year, with English translations available by 1845. Both works feature a review of natural phenomena, but *Vestiges* has a more restricted purpose, arguing for the existence of a process of organic evolution. But, even from just the quotations given above, one can see that *Cosmos* preaches, at the very least, the existence of “connections” between natural forms. *Vestiges*, moreover, ultimately is unable to project a process model that could result in organic evolution. Wallace (and just about everyone else) recognized this weakness right away. The author’s train of thought was interesting, but on the other hand the book’s anonymous publication made it suspect. Humboldt, by contrast, was a world-famous figure as a man of science, and Wallace would have found his words, even if not directly supporting an evolutionary reality, appealing for their visionary worth. The result, as we shall consider below, was a Wallace who in his initial view of cosmology, favored an evolutionary process that worked more from the top down, than from the details of adaptation, up.

Two more figures must be considered before moving on to a look at Wallace’s actual progress toward conceiving an evolutionary mechanism.

Thomas Malthus and Herbert Spencer

In several different places Wallace referred his familiarity with Malthus back to his days in Leicester (“... perhaps the most important book I read [while at Leicester] was Malthus’s

⁴⁰ *Cosmos*, vol. 1. Harper & Brothers, 1850.

'Principles of Population' . . . its main principles remained with me as a permanent possession"⁴¹), but occasionally it has been suggested that Wallace's memory might have been deficient on this matter. Despite lack of incontrovertible evidence on this score, however, there seems little reason to doubt him, as the writings of Malthus had been very widely circulated. Malthus's ideas on the "negative checks" on human population growth are known to have affected Darwin's thinking early on as well, and given the overall structure of the natural selection concept, either Malthus's ideas or some line of reasoning very close to it (Liebig?) must have crossed Wallace's mind at the critical time.

Wallace apparently first came into contact with Spencer's writings in the early 1850s: "soon after I returned from my travels in the Amazon Valley, I read his book on *Social Statics*, and from it first derived the conception of the radical injustice of private property in land. His irresistible logic convinced me once for all, and I have never since had the slightest doubt upon the subject. He taught me, that 'to deprive others of their rights to the use of the earth is to commit a crime inferior only in wickedness to the crime of taking away their lives or their personal liberties'."⁴² Wallace was especially impressed with Spencer's "social justice" concept; Spencer reasoned that one should receive no more nor less – especially no more – than his or her just due, a position Wallace adopted and endorsed through to the end of his life. Wallace would take this idea as the basis for his model of social evolution, applying it both to individual ethical and moral conduct (and ultimately spiritualism), and to a program of land reform that affected the social order.

With these main individual influences noted, we are now ready to review Wallace's progress toward the theory of natural selection.

Wallace on Evolution, 1845 to 1858

Although Wallace became a transmutationist no later than about 1845 with his reading of *Vestiges*, it is a mistake to think that his early thoughts on the subject were leading him inexorably in the direction of his triumphal discovery of natural selection in 1858. Actually, and though he had correctly understood that he needed to get into the field to explore the problem, he started off his researches with an important pair of misconceptions.

Wallace's first significant writings on natural processes date from 1852 and 1853, after his return from the Amazon. It is in "On the Monkeys of the Amazon" that we first observe Wallace trying to make evolutionary sense of the patterns of distribution he witnessed:

On this accurate determination of an animal's range many interesting questions depend. Are very closely allied species ever separated by a wide interval of country? What physical features determine the boundaries of species and of genera? Do the isothermal lines ever accurately bound the range of species, or are they altogether independent of them? What are the circumstances which render certain rivers and certain mountain ranges the limits of numerous species, while others are not? None of these questions can be satisfactorily answered till we have the range of numerous species accurately determined. During my residence in the Amazon district I took every opportunity of determining the limits of species, and I soon found that the Amazon, the Rio Negro and the Madeira formed the limits beyond which certain species never passed. The native hunters

⁴¹ *My Life* 1905, vol. 1, p. 232.

⁴² "Presidential Address." *Report of the Land Nationalisation Society 1891–1892* (Land Nationalisation Society Tract 48, 1892): 15–26, on p. 15.

are perfectly acquainted with this fact, and always cross over the river when they want to procure particular animals, which are found even on the river's bank on one side, but never by any chance on the other. On approaching the sources of the rivers they cease to be a boundary, and most of the species are found on both sides of them. Thus several Guiana species come up to the Rio Negro and Amazon, but do not pass them; Brazilian species on the contrary reach but do not pass the Amazon to the north. Several Ecuador species from the east of the Andes reach down into the tongue of land between the Rio Negro and Upper Amazon, but pass neither of those rivers, and others from Peru are bounded on the north by the Upper Amazon, and on the east by the Madeira.⁴³

With these words Wallace introduced what is now known as the “riverine barriers” hypothesis of species formation: the idea that substantial barriers to population dispersal can retard intermixture, and thus create an isolation leading to the divergence of populations into new species. At that time, however, this was just a biogeographical observation. Wallace probably suspected that this pattern of relations spoke to an evolutionary process, but he had no idea of how such change might take place at the level of individual organisms.

The only other paper Wallace wrote at this time on such questions was a treatment of the habits of Amazon butterflies.⁴⁴ This work focused largely on ecological associations, however. There was an impact on his thinking of the subject, however, as is apparent from one of the most interesting passages in his 1853 book, *A Narrative of Travels on the Amazon and Rio Negro*:

. . . In all works on Natural History, we constantly find details of the marvellous adaptation of animals to their food, their habits, and the localities in which they are found. But naturalists are now beginning to look beyond this, and to see that there must be some other principle regulating the infinitely varied forms of animal life. It must strike every one, that the numbers of birds and insects of different groups, having scarcely any resemblance to each other, which yet feed on the same food and inhabit the same localities, cannot have been so differently constructed and adorned for that purpose alone. Thus the goat-suckers, the swallows, the tyrant flycatchers, and the jacamars, all use the same kind of food, and procure it in the same manner: they all capture insects on the wing, yet how entirely different is the structure and the whole appearance of these birds! The swallows, with their powerful wings, are almost entirely inhabitants of the air; the goat-suckers, nearly allied to them, but of a much weaker structure, and with largely developed eyes, are semi-nocturnal birds, sometimes flying in the evening in company with the swallows, but most frequently settling on the ground, seizing their prey by short flights from it, and then returning to the same spot. The fly-catchers are strong-legged, but short-winged birds, which can perch, but cannot fly with the ease of the swallows: they generally seat themselves on a bare tree, and from it watch for any insects which may come within reach of a short swoop, and which their broad bills and wide gape enable them to seize. But with the jacamars this is not the case: their bills are long and pointed – in fact, a weak kingfisher's bill – yet they have similar habits to the preceding: they sit on branches in open parts of the forest, from thence flying after insects, which they catch on the wing, and then return to their former station to devour them. Then there are the trogons, with a strong serrated bill, which have similar habits; and the little humming-birds, though they generally

⁴³ “On the Monkeys of the Amazon.” *Proceedings of the Zoological Society of London* 20, 1852: 107–110, on pp. 109–110.

⁴⁴ “On the Habits of the Butterflies of the Amazon Valley.” *Transactions of the Entomological Society of London* April 1854: 253–264.

procure insects from the flowers, often take them on the wing, like any other fissirostral bird. What birds can have their bills more peculiarly formed than the ibis, the spoonbill, and the heron? Yet they may be seen side by side, picking up the same food from the shallow water on the beach; and on opening their stomachs, we find the same little crustacea and shell-fish in them all. Then among the fruit-eating birds, there are pigeons, parrots, toucans, and chatterers, – families as distinct and widely separated as possible, – which yet may be often seen feeding all together on the same tree; for in the forests of South America, certain fruits are favourites with almost every kind of fruit-eating bird. It has been assumed by some writers on Natural History, that every wild fruit is the food of some bird or animal, and that the varied forms and structure of their mouths may be necessitated by the peculiar character of the fruits they are to feed on; but there is more of imagination than fact in this statement: the number of wild fruits furnishing food for birds is very limited, and the birds of the most varied structure and of every size will be found visiting the same tree.⁴⁵

It is in this passage that we begin to see the effects of Wallace's attention to Humboldt and Liebig some years earlier. He passes by the "details of the marvellous adaptation of animals" and moves immediately toward a Humboldtian view "that there must be some other principle regulating the infinitely varied forms of animal life." He braces this viewpoint with a nod toward limiting factors logic: "the number of wild fruits furnishing food for birds is very limited," and the idea that this resource is competed for. But he misses the real point, that "birds of the most varied structure and of every size will be found visiting the same tree," thereby failing to entertain the possibility there may be a one-to-one cause and effect between particular adaptations and particular evolutionary lineages and, secondarily, between particular environmental influences and particular adaptations. Why did he do this?

Wallace's enthusiasm over Chambers's *Vestiges* came in part from that author's position that the underlying theme of existence was progressive development – right up through the eventual development of "godly" beings. As we have already noted, by the time he read the book, Wallace had long since adopted progressive ideas on societal evolution; his Owenist leanings led him to believe that societal wrongs could be eliminated through intelligently conceived, humanistic, programs of reform. Meanwhile, his position on organic change was being shaped by Lyellian uniformitarianism, and the Bauplan-like geographical and cosmological views of Humboldt. Through this combination of understandings one could imagine generally-acting physical laws that inherently gave rise to progressive biological change – that the "general design" of nature featured uniformitarian laws sustaining an evolutionary process.

Soon after reading *Vestiges* Wallace settled on a means of investigating Chambers's "progressive development" leanings. The initial focus became how species lines diverged, probably because the causal sequence involved seemed simplest. But it was one thing to document a historical sequence, and quite another to relate it to events occurring at the level of the lives of individual organisms. As I described it a few years ago, as of 1845 Wallace had a choice to make between two approaches to the question:

The first was to imagine that evolution proceeded as a function of changes originating with the individuals themselves. Such was the approach taken by Lamarck, who had suggested that individual creatures might change over the span of their own lifetimes (in

⁴⁵ *A Narrative of Travels on the Amazon and Rio Negro*. Reeve & Co., 1853, on pp. 83–85.

response to environmental pressures), and pass this change along to their progeny: this is the notion of the inheritance of acquired characters. This model had the virtue of logical simplicity; if the adaptational suite of each creature changed in such a fashion, then so too, of course, would the species population in sum. Unfortunately, there was not a shred of convincing evidence that nature operated in this fashion, either at the level of individuals, or as populations. Wallace was aware of Lamarck's theory, but apparently rejected it from the outset.

Conversely, the regulation of change might be mediated at the population level itself, with the results being evident only secondarily in the characteristics of its component individuals. Some earlier workers – most notably, Buffon – had espoused this approach (in Buffon's case, the initiating force imagined was a general environmental one), but no one had been able to suggest anything resembling a mechanism. That is, no one outside of the realm of theism. Creationists argued that the Creator had specially provided all the earth's creatures with precisely what they needed to survive. This was, in its own way, a theory of evolution (at least, of initiation), and it had the advantage of linking the state of the adaptational suite of both individual creatures and entire populations to a direct, utilitarian function: simply, organisms were created to fill a pre-ordained environmental role. Nevertheless, Wallace rejected this notion outright, agreeing with Chambers that the natural progression had to be self-regulating to conserve an intelligible relation of cause to effect.

Given the guiding influence of *Vestiges* and the limitations of the choices available to him, Wallace opted for the secular version of the second of the two models. This immediately left him with the difficulty of conceiving of an action that worked primarily at the population level, yet left its imprints on the state of the individual organism at any given time.

The principle of natural selection would eventually solve this problem, but this is dependent on the notion of "necessary utility"; that is, that the products of natural selection, adaptive structures, must have a utilitarian function (or at the least be somehow correlated with ones that do). As we have just seen, however, during this early period Wallace rejected the utility-based arguments produced by both Creationists and Lamarckists. Later, of course, he would become a firm defender of "necessary utility" thinking – so much so that he has been referred to as a "hyperselectionist" by detractors.⁴⁶ Wallace himself accepted this portrayal, once stating "The principle of 'utility,' which is one of [natural selection's] chief foundation stones, I have always advocated unreservedly . . ."⁴⁷ But neither here nor in any other later writing I am aware of does he specify what his thoughts were on the subject of utility *before* he came up with the principle of natural selection. We need to probe this a bit more here, as it is a matter that directly connects historical record to process in a way that he might have been able to appreciate as a practicing field biologist.

I suggest that Wallace's slow march toward natural selection was not so much a function of his being unable to identify a specific mechanism of change, as it was his flat rejection of the "necessary functional utility to adaptation" argument. In these early years (that is, the 1840s and early and mid-1850s) he had been unable to wrap his head around

⁴⁶ Stephen Jay Gould, "Wallace's Fatal Flaw." *Natural History* February 1980: 26–40; Kevin J. Tierney, "Hyperselectionism and Hyperbehaviorism Are Unstable Strategies." *The Psychological Record* 42, 1992: 469–478.

⁴⁷ *My Life* 1905, vol. 2, p. 22.

the notion of an evolutionary agent that affected all populations in like fashion, yet produced individually and uniquely adapted organisms. Still following the view expressed in *Vestiges* that evolution consisted of a “progressive” succession of living forms, Wallace found himself with three tasks. First, he had to demonstrate unequivocally that evolution in fact took place. This was a nontrivial problem, but it was the easiest one to attack, assuming the answer was yes. Second, he needed a model of how it took place on the basis of conditions immediate to the station and activities of living things. Last and perhaps most difficult, he had to identify not only these immediate causes, but the way his assumed final cause operated on them to produce a form of change that was progressive.

If one believes comments contained in his 1855 essay “On the Law Which Has Regulated the Introduction of New Species” he very quickly saw how to approach the first problem – through analysis of the spatial-temporal links between the present distribution of organisms and their fossil record. This part of the plan was executed in the “Sarawak Law” (see below) message of that essay. As of the beginning of 1858, however, he had made no progress whatsoever on the second problem. One supposes he thought the answer – whatever it was – would emerge as part of the solution to the third problem. So, once he had examined enough “facts” and confirmed the spatial-temporal relations of geography and geology that indicated evolution really took place, he followed a Humboldtian route and put his attention on the final cause issue. This left the matter of the individual components of change – at the immediate biological level – up in the air for the moment. These were, as he later wrote, “unconceivable”: “My paper written at Sarawak [“On the Law...”] rendered it certain in my mind that the change had taken place by natural succession and descent – one species becoming changed either slowly or rapidly into another. But the exact process of the change and the causes which led to it were absolutely unknown and appeared almost unconceivable.”⁴⁸

Thus Wallace undoubtedly realized even then that the “law” expressed in that paper did no more than state the essential *results* of the species divergence process in time and space. He had offered up a generalization describing a certain continuity of *effects* only. Later he wrote: “[The] title [of the paper] was ‘On the Law which has Regulated the Introduction of New Species,’ which law was briefly stated (at the end) as follows: ‘Every species has come into existence coincident both in space and time with a pre-existing closely-allied species.’ This clearly pointed to some kind of evolution. It suggested the *when* and the *where* of its occurrence, and that it could only be through natural generation, as was also suggested in the *Vestiges*; but the *how* was still a secret only to be penetrated some years later.”⁴⁹ Workers in Wallace’s own time recognized this distinction; consider the following comments from a period review of *On the Origin of Species* by William Hopkins:

We may instance another case, which has more the character of a geometrical generalization than of a physical theory. We allude to Mr. Wallace’s views respecting the law which has regulated the introduction of new species... Mr. Wallace has put forth this view in a clear and striking manner, so far as it is represented as a generalization of observed facts, which show a juxtaposition in time and space of allied species; but to

⁴⁸ *My Life* 1905, vol. 1, p. 360.

⁴⁹ *My Life* 1905, vol. 1, p. 355.

convert it into a physical theory in the proper sense of the expression, some physical cause should be assigned, from the action of which this law of the phenomena would result. But there is no allusion to such cause. And therefore it is that we cannot approve of the assertions that the most singular peculiarities of anatomical structure are explained by it, and that many of the most important facts of nature are almost as necessary deductions from it, as are the elliptic orbits of the planets from the law of gravitation...⁵⁰

So, it is one thing to demonstrate the *fact* of evolution, and quite another to explain how it produces the details of adaptation that contribute to its own unfolding. My interpretation of Wallace's basic strategy during this period was to try to identify some kind of global environmental force that produced such continuities of effects: those evident both in the emergence of species from varieties, and as species lines whose trace through time is captured in the fossil record.

In 1856 Wallace produced another writing which very clearly reveals his point of view on this matter at that point.

High on the list of Wallace's objectives in traveling to the Malay Archipelago was to conduct field studies of the orangutan. When Sir James Brooke invited him to Sarawak in late 1854, he got his chance. One of the results of his efforts was an essay published in early 1856. In it he writes:

Naturalists are too apt to imagine, when they cannot discover, a use for everything in nature: they are not even content to let "beauty" be a sufficient use, but hunt after some purpose to which even that can be applied by the animal itself, as if one of the noblest and most refining parts of man's nature, the love of beauty for its own sake, would not be perceptible also in the works of a Supreme Creator.

The separate species of which the organic world consists being parts of a whole, we must suppose some dependence of each upon all; some general design which has determined the details, quite independently of individual necessities. We look upon the anomalies, the eccentricities, the exaggerated or diminished development of certain parts, as indications of a general system of nature, by a careful study of which we may learn much that is at present hidden from us...⁵¹

Expressed in these words is the straightforward concept, that there exists a "general design which has determined the details, quite independently of individual necessities." A more perfect example of Humboldtian thinking in Wallace's writings could hardly be found; this reflects: (1) Wallace's rejection of the idea there are first causes behind "any and every special effect in the universe," and (2) an acknowledgment there yet exists a confining "general design." As Scott Kleiner has pointed out,⁵² however, he looked upon this "general design" over all the specifics of diversification and adaptation in a way similar to the manner in which Newtonian physics accounted for all individual gravitational relationships in the heavens; *i.e.*, by specifying antecedent relationships, but not specific

⁵⁰ As reprinted in David Hull, *Darwin and His Critics* (Harvard University Press, 1973), p. 245.

⁵¹ "On the Habits of the Orang-utan of Borneo." *Annals and Magazine of Natural History* July 1856: 26–32, on pp. 30–31.

⁵² Kleiner, Scott A., April 1981. "Problem Solving and Discovery in the Growth of Darwin's Theories of Evolution. *Synthese* 47, 1981: 119–162; "Darwin's and Wallace's Revolutionary Research Programme." *British Journal for the Philosophy of Science* 36, 1985: 367–392.

outcomes. Wallace's dislike of the doctrine of first causes did not extend to a dismissal of the possibility of final causes.

This passage also contains the suggestion that our love of beauty should itself be seen as a work of the "Supreme Creator." The latter is thereby placed as: (1) further removed from the immediate cause of each modification than Creationists believed; and (2) more broadly encompassing than were it merely responding to individual material needs and/or conscious desires. At least as early as 1856, therefore, Wallace was arguing that the "general design" of observable nature included not merely the organization of material things within it, but: (1) the emotional and intellectual responses of humankind to those material things, and (2) the possibility of higher causes altogether. And, those "higher causes" were not necessarily to be viewed as unsystematic in their enaction (as opposed to the largely unpredictable Godly "first causes").

Some other comments in the 1856 orangutan essay are even more instructive:

...Do you mean to assert, then, some of my readers will indignantly ask, that this animal, or any animal, is provided with organs which are of no use to it? Yes, we reply, we do mean to assert that many animals are provided with organs and appendages which serve no material or physical purpose. The extraordinary excrescences of many insects, the fantastic and many-coloured plumes which adorn certain birds, the excessively developed horns in some of the antelopes, the colours and infinitely modified forms of many flower-petals, are all cases for an explanation of which we must look to some general principle far more recondite than a simple relation to the necessities of the individual. We conceive it to be a most erroneous, a most contracted view of the organic world, to believe that every part of an animal or of a plant exists solely for some material and physical use to the individual – to believe that all the beauty, all the infinite combinations and changes of form and structure should have the sole purpose and end of enabling each animal to support its existence – to believe, in fact, that we know the one sole end and purpose of every modification that exists in organic change, and to refuse to recognize the possibility of there being any other. Naturalists are too apt to imagine, when they cannot discover, a use for everything in nature...

...we believe that the constant practice of imputing, right or wrong, some use to the individual, of every part of its structure, and even of inculcating the doctrine that every modification exists solely for some such use, is an error fatal to our complete appreciation of all the variety, the beauty, and the harmony of the organic world... (pp. 30-31)

And this, only two years before he authored the famous Ternate essay on natural selection! Clearly he is exhorting us to abandon the notion that adaptations are either of necessary use to organisms, or present for reasons fulfilling some prior purpose.

Wallace appears to have also counted the existence of what he termed "rudimentary" (now called "vestigial") organs as a point favoring the "nonuse" argument. In a note in the same essay on the orangutan he refers approvingly to "the talented author of the *Plurality of Worlds*" (William Whewell), quoting a passage from that work:

In the structure of animals, especially that large class best known to us, vertebrate animals, there is a general plan, which, so far as we can see, goes beyond the circuit of the special adaptation of each animal to its mode of living; and is a rule of creative action, in addition to the rule that the parts shall be subservient to an intelligible purpose of animal life. We have noticed several phenomena in the animal kingdom, where parts and features

appear rudimentary and inert, discharging no office in their oeconomy, and speaking to us not of purpose, but of law.

A year earlier in “On the Law...” he commented in similar fashion: “Another important series of facts, quite in accordance with, and even necessary deductions from, the law now developed, are those of *rudimentary organs*. That these really do exist, and in most cases have no special function in the animal oeconomy, is admitted by the first authorities in comparative anatomy.”⁵³ This point played into Wallace’s argument quite easily: such structures were difficult to explain in the absence of forces yielding slow, gradational changes in organisms (forces, one supposes, capable of overriding the lack of utility of such structures). But he was a victim of misinformation. His belief at the time was that vestigial characters were incipient creations rather than the remnant structures we now know them to be. Viewing them thus, and observing that it was agreed they had no function at that point, he would have seen this as the best kind of evidence of a process producing outcomes that were not necessarily utilitarian.

The really interesting question, however, is just how far Wallace might have taken this matter of “rudimentary” structures. For example, consider how in the following passage he seems to portray mankind’s entire biological, self-centered existence as “rudimentary” with respect to his future more enlightened state:

...The well-spent life is that in which those faculties which regard our personal physical well-being, are subordinated to those which regard our social and intellectual well-being, and the well-being of others; and that inherent feeling – which is so universal and difficult to account for – that these latter constitute our higher nature, seems also to point to the conclusion that we are intended for a condition in which the former will be almost wholly unnecessary, and will gradually become rudimentary through disuse, while the latter will receive a corresponding development.⁵⁴

These remarks were penned in 1874, by which time the true nature of “rudimentary” structures was known, but it is entirely possible that before 1858 Wallace was applying the earlier understanding both to his appreciation of certain biological structures, and to human characteristics as well. It would have been easy for him to view many of the higher human qualities as incipient phenomena: that is, as adaptive mechanisms that continued to emerge before there was any practical use for them. Even today, in a world of modern psychological theory, an ability might be treated as either or both incipient or vestigial, depending on how one examines the question: particular human mental abilities could be viewed as “leftover” remnants from evolutionary predecessors, or instead represent emergent structures. It thus seems quite reasonable that Wallace often warned anthropologists to approach their subject with an open mind, especially in their assumptions that all the beliefs of primitive peoples derive from uninformed ignorance. This also was at least part of his reason for wanting people to take the subject of spiritualism seriously: honest mediums might be the instruments of processes that were incipient, not the remnants of ignorant beliefs. Witchcraft fell into a similar category: note the following comments, taken from an 1872 review of a work by Robert Dale Owen:

⁵³ “On the Law Which Has Regulated the Introduction of New Species.” *Annals and Magazine of Natural History* September 1855: 184–196, on p. 195.

⁵⁴ “A Defence of Modern Spiritualism, Part II. Spirit-photographs. *Fortnightly Review* 1 June 1874: 785–807, on p. 803.

He shows us how important it was for the welfare of man that the belief in such phenomena should die out when it did, and leave us free to develop the doctrine of law, and to overthrow the very idea of infallible or absolute truth in matters of religion. All the horrors of witchcraft, and all the persecutions of priests, arose from the dogma of infallibility; for if that dogma had been true, persecution would not have been a crime, but a duty. The world could not reach the fundamental truths of these phenomena, or understand their real import, as long as they believed in the devil and in their own infallibility. Now, they are able to investigate the phenomena calmly, and reason upon them logically...⁵⁵

* * *

By the mid and late 1850s Wallace had begun to recognize several instructive trends in organism–environment relations on islands. In 1984 John Langdon Brooks described Wallace’s impressions of the conditions on the island of Aru, making use of passages from Wallace’s 1857 in–the–field “Species Notebook”:

The developing drought appears to have focused Wallace’s attention on the vicissitudes of the seasons, particularly evident in that part of the Archipelago. That seasonality was a continuing interest is seen in a field journal entry written during the prau’s return to Macassar: [Wallace:] “The sky was continually cloudy and dark and threatening with slight drizzling showers occasionally, till we were west of the Island of Bouru when it cleared up and we enjoyed the bright sunny skies of the dry season in the western part of the Archipelago. Here, therefore, seems to be the place where the remarkable change of seasons occurs between the eastern and western districts. This difference however seems to consist rather in the gloom and dampness of the atmosphere than in the absolute quantity of rain, for the little fresh water streams in Aru were all dried up when we left while in January and February and March they were always flowing, the intervals of rainy weather being marked by heavy showers and the general temperature being higher. The driest time of all in Aru according to both traders and natives occurs in September and October, so that though the seasons there are very different from those of Celebes and Java they cannot be said to be opposite to them. It will be interesting to trace the modifications in the various islands of the Moluccas and it is much to be wished that the Dutch government would establish simple registers of thermometer Rain and Wind in all the places where they have settlements by which in a few years data would be furnished which might enable the various anomalies of climate to be reduced to some dependence on general laws...”

...Both the fauna of Aru and its indigenous human population proved quite other than expected. Wallace had expected the fauna to be largely New Guinean in character but poor in species, as would be characteristic of a group of small islands separated from that large landmass by over a hundred miles of ocean. Instead, he found a richness of animal life, even in dense forest, that was exclusively New Guinean – species for species, to the extent that he could judge. The explanation of this virtual faunal identity was revealed by the discovery of clear physiographic evidence that the sea between Aru and New Guinea had been created by recent subsidence – recent in geological time. This discovery provided Wallace with a geographic situation of the kind he had sought since his Amazonian days ... According to his theory, only a slight change in the organic world should be manifest following a recent physiographic change. The species of birds, mammals, and insects that he found in Aru were identical to those described for New Guinea, with the sole exception

⁵⁵ Review of *The Debatable Land Between This World and the Next* by Robert Dale Owen. *Quarterly Journal of Science* April 1872: 237–247, on p. 238.

of the *Ornithoptera*. The Aru form was distinct, but minimally so, from *O. poseidon*, described from New Guinea. Observation thus confirmed theory. Wallace used these observations in Aru to provide the basis for a public challenge to the Lyellian theory of special creation, as well as an opportunity to present his own views of how organic change followed geographic change.⁵⁶

In fact, Wallace was increasingly rejecting the idea that immediate conditions of climate have much to do with regulating the distribution of existing species. In "On the Natural History of the Aru Islands, from 1857, he concludes "that some other law has regulated the distribution of existing species than the physical conditions of the countries in which they are found, or we should not see countries the most opposite in character with similar productions, while others almost exactly alike as respects climate and general aspect, yet differ totally in their forms of organic life . . . It is evident that, for the complete elucidation of the present state of the fauna of each island and each country, we require a knowledge of its geological history, its elevations and subsidences, and all the changes it has undergone since it last rose above the ocean."⁵⁷

Wallace's de-emphasis on climate as a causal factor also shows up in his comparisons of insect size and color between temperate and tropical regions. Note, for example, the following passage from his 1856 essay "Observations on the Zoology of Borneo":

...I am in hopes, therefore, that this collection may give a *true* idea of the Entomology of this country... My Bornean collection shows that brilliant colours are by no means the necessary accompaniments of a tropical sun, for I doubt if, in that respect, these insects will surpass those even of Britain... there is a real want of size and brilliancy in the average of the Bornean Coleoptera; but I think we can show that this is also the case with insects from other tropical countries, compared with those from the sub-tropical or south temperate zone... The extensive collections of Mr. Bates on the Amazon show the same small average size of the Coleoptera compared with those of the Brazilian mountains, the Andes and Mexico... We may, I think, therefore conclude that tropical heat is not necessary to the great brilliance or size of insects, but that those of the countries bordering the Tropics are often equal, and sometimes superior, to those of countries situated nearer the equator.⁵⁸

And then, in the last letter from the field published before his recognition of the natural selection concept, he continues:

...To persons impressed with the idea of the prevalence of large insects in the tropics, my Macassar collections will appear most extraordinary; the average size is certainly less than that of our British species, and the colours not at all more brilliant... I believe that a careful examination of these will lead to the conclusion that there is no superiority of these will lead to the conclusion that there is no superiority whatever in the average size of tropical Coleoptera over those of temperate climates, and that in many groups the latter have the decided advantage.⁵⁹

⁵⁶ John L. Brooks, *Just Before the Origin; Alfred Russel Wallace's Theory of Evolution*. Columbia University Press, 1984, on pp. 171–172.

⁵⁷ "On the Natural History of the Aru Islands," *Annals and Magazine of Natural History, Supplement* to vol. 20 (2nd s.): 473–485, on pp. 481 & 483.

⁵⁸ "Observations on the Zoology of Borneo," *Zoologist* June 1856: 5113–5117, on p. 5114–5115.

⁵⁹ untitled, *Zoologist* 16: 6120–6124, on pp. 6122, 6124.

This leads us back to the earlier-posed interpretation that before 1858 Wallace perceived adaptation *per se* – and adaptations – as representing some kind of result, rather than a cause, of the “progressive development” of organisms. Some more general, geological/geographical, force had to be behind the way new characters combined to effect “progress.” And, whatever those influences were, Wallace was not connecting them to any supposition of necessary character utility. H. Lewis McKinney observed in 1972 that Wallace may have believed that adaptations “occurred” while species evolved, but that this association was merely correlative; *i.e.*, derivative.

Wallace’s anti-“necessary utility” stance must have been fortified by his experiences with the native peoples he met over his course of travels. As McKinney⁶⁰ and others have shown, Wallace had been pondering mankind’s place in evolution from his first attention to the subject. He recognized that many of the adaptations of people in primitive cultures could be linked to local peculiarities of environment, yet there were just as many that were difficult to relate. The connection between morality and survival, for example, seemed weak, and there was an even greater problem figuring mathematical, artistic or musical abilities. However evolution operated, it seemed to involve adaptations/abilities that sometimes were directly functional and sometimes were not, at least in terms of affecting basic survival. This was one of the reasons for Wallace’s interest in the orangutan: as a bridge between animals and humans, it might provide some interesting insight. But judging from the earlier comments excerpted from his “On the Habits of the Orang-utan of Borneo,” study of this animal had not changed his then-existing opinions as to the derivative nature of utility.

* * *

In conclusion, it seems to me that Wallace’s pre-natural selection efforts reflect his adoption of an idiosyncratic form of teleology. Under the influence of Owen and Chambers, Wallace had allowed the concept of “progress” to dominate his concept of evolution, probably to the point of imagining a system-level movement toward the development of higher, “godly,” beings. But Wallace’s teleology did not depend on any element of Lamarckian goal-centered thinking, which allowed a causal role to adaptation. In Wallace’s thinking, the active force was set at a more remote level. It overrode individual effects through continuity of influence, just as Newtonian forces had supported the consolidation of the solar system, and Humboldtian ones had contributed to a unified geographical milieu. Thus, the view was that individual “accumulations” of characters were being organized at a more general level of environment.

It might be thought that this orientation was “corrected” by Wallace’s eventual discovery of natural selection, but this would be a misconception. Actually, neither natural selection nor his adoption of spiritualism would have any profound effect on re-directing this basically progress-serving cosmology. Wallace’s later writings frequently feature his special brand of teleology; a particularly good example of this perspective is afforded by the following lines from his 1874 book review of George St. Clair’s *Darwinism and Design*:

⁶⁰ McKinney, H. Lewis, “Alfred Russel Wallace and the Discovery of Natural Selection.” *Journal of the History of Medicine and Allied Sciences* October 1966: 333–357; “Wallace’s Earliest Observations on Evolution: 28 December 1845. *Isis* 60, 1969: 370–373; *Wallace and Natural Selection*. Yale University Press, 1972.

... "Suppose," answers Mr. St. Clair, "we inquire into the water supply of some town, tracing the course of the main pipe, and all the branches ramifying from it; and suppose that on one side of the town we find a pipe diverging half-a-mile into the country, and then being round and returning, like the winding of some river. We ask, where is the wisdom of carrying the water through this mile of pipe, when it might go by the short cut? Why waste the tubing and waste the time, and do what has to be undone immediately, in sending the stream to a point from which there is no course but to return? On the supposition that the town was originally built as it now stands, every street and square having the position they now have, and not a house more nor less, our objection is valid. But if we learn that the diverging bend of pipe follows the route of streets which formerly existed, and that although the shorter cut would now seem better, yet it would cost more to take up the old pipes from the long route, and lay down pipes on the short route, than could possibly be gained by the process, we see the wisdom of leaving the arrangement as it is, and we read in the existence of the bend of pipe a page of the past history of the town."

This, we say, is ingenious, and on the hypothesis that the Divine Being has no command over nature different in kind from that of man, may have some logical plausibility. But in the case of the water-pipes, the townsmen would have removed the tubing when it became no longer useful in its original position, if they had been able, without loss or trouble beyond what the thing was worth, to do so. The very notion of infinite power as belonging to God must be abandoned, if His workmanship is so severely limited as this comes to. The human architect removes the piles used in the construction of a bridge from the river-bed. It is an important consideration, however, which we put at Mr. St. Clair's service, that, but for the leaving of the pipes of his illustration in the old route, the architectural history of the town might have been irrecoverable. Creation by evolution has this advantage, that the procession of being leaves traces of its advance which man can read. So far as human reason can perceive, there was no other method by which the archives of the universe could be folded up and preserved for the instruction of intelligent creatures. If evolution has high intellectual uses which special creation would not have had, and if man is God's child, it is not presumptuous to pronounce evolution more worthy of God than special creation.⁶¹

Here, especially in the last few lines, we see a teleology of final causes based on the understanding that progress is self-serving, and law-based. Writings of this sort may be found at all points of Wallace's career – from some of early ones already referred to, to later ones such as "The Reign of Law" (1867), *Darwinism* (1889), or *The World of Life* (1910).

I suggest that Wallace's pre-natural selection quest amounted to a search for what might be termed a "geographical Bauplan." Combining the perspectives of Newton and Humboldt, he anticipated that the details of animal distribution would reveal to him, in their organized relations, those ever-present, uniformly-acting laws that conspired to guide evolution. This geography-based perspective should not come as a surprise to students of his work. Wallace, in the first instance, was a geographer, as attested by his interest in biological distribution patterns, travel, island life, glaciology, climatology, land reform, geomorphology, and social problems, among other things. Clearly, he did not have much interest in the study of internal anatomy, or in laboratory work. Note, moreover, that all of his pre-1845 nature-related activities had had a distinctly geographical side: plant and insect collecting, surveying, land use evaluation, and agricultural economics. And, as

⁶¹ review of *Darwinism and Design; Or Creation by Evolution* by George St. Clair. *Spectator* 25 April 1874: 535–536, on p. 536.

discussed earlier, many or most of the writings he digested had had strongly geographical themes. Further, of course, a geographical framework was less remote from the world of human societal change.

During his pre-1858 period, then, geographical determinism – as related to explaining both biological and social evolution – was Wallace's working hypothesis on evolution. Yet it also appears that during this whole time he regarded species diversification *per se* as the main distinguishing feature of biological advance. Again, adaptation was derivative, or even incidental: a possible indication of interaction with the environment, but not the *cause* of change. Yet Wallace recognized that adaptive characters could be used to distinguish between varieties, and that the emergence of varieties was crucial to an appreciation of the process of speciation. It remained to link his "Sarawak law" of geographical/geological pattern formation to the biology of individual organisms.

As I wrote a few years ago:

But as the years passed, Wallace could not recognize any way in which the greater conditions of environment imposed an influence of the kind he was anticipating. Moreover, important characteristics of individual species of animals really *did* seem more relatable to immediate causal agencies. There was, further, the persisting problem of how to fit social evolution into the picture. Man passed on innovations – in the form of mathematics, art, music, moral teachings, etc. – and did so regardless of whether there seemed to be any survival value involved. How could organic evolution proceed in a fashion responding to environmental constraints and opportunities, yet produce adaptive structures whose persistence was not necessarily a direct and exclusive function of those constraints and opportunities?⁶²

Chapter Three. Wallacian Natural Selection and Biogeography: Past and Future

Natural Selection

Around February of 1858 Wallace had the famous bout with malaria that left him with a solution to the impasse of thought he had experienced for more than ten years. If we believe his later accounts, the key was Malthus. Although it seemed evident that population levels would never rise to levels that could not be supported by available resources, as Malthus suggested, the characteristics of populations might change in a manner making the use of *other* resources a survival strategy. This made it possible after all to create a naturalistic argument for the necessity of utility: admitting character variation, preferential selection could be viewed as favoring *whatever* adaptations that could serve to maintain the population through differential persistence. One could use this approach to understand the process of diversification, as long as it was accepted that selection itself (as opposed to all the individual "accumulations" of character states) was the generalizable law, the necessary result of interaction between life and its surrounding ecological/environmental conditions.

⁶² Alfred Russel Wallace: Evolution of an Evolutionist. Chapter Three.
<http://people.wku.edu/charles.smith/wallace/chsarw3.htm>

Many writers have suggested that Wallace envisioned a selection process operating at least in part at the group level; that is, that produced new populations derived from varieties characterized by distinct adaptive suites. Wallace appears to have been thinking in terms of statistical generalizations, and one of the indications of this is the rules for systematic revision (multiple character trait-based analysis, etc.) he was applying at the time. He felt that single characters could not be trusted to distinguish one species from one another taxonomically, and if this were the case then neither were they likely to represent the only relevant population-dividing influences. Suites of peculiarities defined species. In 1880 Wallace wrote on this as follows:

From the fact of variation, so extensive as regards the number of variable characters and so large in absolute amount as has now been proved to exist in many species, we may fairly draw the conclusion that analogous variation, sometimes of less and sometimes of greater extent, is a general characteristic of animals in a state of nature; and with such materials to work with it becomes easy to understand how new species may arise. For example, the peculiar physical or organic conditions that render one part of the area occupied by a species better adapted to an extreme variety may become intensified. The most extreme variations in this direction will then have the advantage, and will multiply at the expense of the rest. If this change of condition should extend over the whole area occupied by the species, this one extreme form will replace all the others; while, if the area should be cut in two by subsidence or elevation, the conditions of the two portions may be modified in opposite directions, each becoming adapted to one extreme form. The original type of the species will then have become extinct, being replaced by two species, each distinguished by a combination of certain extreme characters which had before existed in some of its varieties.

The changes of conditions which lead to such selection of varieties are very diverse in their nature; and new species may thus be formed diverging in many ways from the parent stock. The climate may change from moist to dry, or the reverse, or the temperature may increase or diminish during long periods, in either case requiring some corresponding change of constitution, of covering, of vegetable or of insect food – to be met by the selection of variations of colour or of swiftness, of length of bill, or of strength of claws. Again, competitors or enemies may arrive from other countries, giving the advantage to such varieties as can change their food, or by swifter flight or greater wariness can escape their new foes. In this way several series of changes may occur, each brought about by the pressure of changed conditions; and thus what was before a single species may become transformed into a group of allied species, differing from each other in a number of slight characters, just as we find them in nature.⁶³

The Ternate model had a characteristic Wallace especially would have liked. Despite the reconnection to utility, it was still possible that certain individual characteristics might have no adaptive value: that is, as long as their presence was correlated, for reasons yet unknown, with ones that did. So now Wallace could explain how new forms came into existence, but at the same time avoid the assumption that structural continuities over time necessarily implied single causal continuities. In “On the Tendency...” he writes: “Here, then, we have progression and continued divergence deduced from the general laws which regulate the existence of animals in a state of nature...,” and “Variations in unimportant parts might also occur, having no perceptible effect on the life-preserving

⁶³ “The Origin of Species and Genera.” *Nineteenth Century* January 1880: 93–106, on p. 102.

powers; and the varieties so furnished might run a course parallel with the parent species, either giving rise to further variations or returning to the former type.”⁶⁴

The most significant element of this indeterminacy was its relevance to those same “higher attributes” Wallace had been struggling to contextualize for years. Many of these, it appeared, had no necessary reason for existing; well, the new understanding did not explain why they were there to begin with, but at least it provided a context for their emergence and persistence. Obviously, there were aspects of evolutionary final causation he still did not understand.

I am thus suggesting that Wallace never thought that *all* levels of adaptation could be attributed to the action of natural selection alone. For those circumstances in which a simple relation between selecting factor and organismal structure could be established, utility remained paramount. But there remained qualities whose relation to evolution remained hidden; that is, whose causes were not yet understood. It was this perspective, I think, and not natural selection itself, that represented the real breakthrough in Wallace’s thinking.

Wallace was undoubtedly looking at such matters from a lot of angles, and it appears that some of the clues came from his appreciation of the relationship between humans and domesticated animals. Consider the following passages from “On the Tendency...”:⁶⁵

...it is the object of the present paper to show that [the] assumption [“that varieties occurring in a state of nature are in all respects analogous to or even identical with those of domestic animals”] is altogether false, that there is a general principle which will cause many varieties to survive the parent species, and to give rise to successive variations departing further and further from the original type, and which also produces, in domesticated animals, the tendency of varieties to return to the parent form. ...

The essential difference in the condition of wild and domestic animals is this, – that among the former, their well-being and very existence depend upon the full exercise and healthy condition of all their senses and physical powers, whereas, among the latter, these are only partially exercised, and in some cases absolutely unused. ...

Half of [the domestic animal’s] senses and faculties are quite useless; and the other half are but occasionally called into feeble exercise, while even its muscular system is only irregularly called into action. Now when a variety of such an animal occurs, having increased power or capacity in any organ or sense, such increase is totally useless, is never called into action, *and may even exist without the animal ever becoming aware of it.* ... [my italics]

...in the domesticated animal all variations have an equal chance of continuance; and those which would decidedly render a wild animal unable to compete with its fellows and continue its existence are no disadvantage whatever in a state of domesticity. ...

We see, then, that no inferences as to varieties in a state of nature can be deduced from the observation of those occurring among domestic animals. *The two are so much opposed to each other in every circumstance of their existence, that what applies to the one is almost sure not to apply to the other.* ... [my italics]

⁶⁴ “On the Tendency of Varieties to Depart Indefinitely from the Original Type.” *Journal of the Proceedings of the Linnean Society: Zoology* 3, 1858: 53–62, on p. 59.

⁶⁵ *Ibid.*, pp. 54–61.

The italicized passages above are of special interest. The first is a rather strange remark; possibly it is a sly allusion to how incipient “higher attributes” in humans come into being. The second illustrates Wallace’s position that domestication as a process did not parallel natural selection – rather, it was its antithesis. No biological “self-regulation” was operating in the case of artificial selection, which produces changes “without the animal ever becoming aware of it” or leaving it at any competitive “disadvantage.”

It is apparent that Wallace had identified this distinction between natural and artificial processes well before his February 1858 revelation. In a letter dated 1 May 1857, Darwin, responding to an earlier Wallace communication (now lost), wrote: “I have acted already in accordance with your advice of keeping domestic varieties, and those appearing in a state of nature, distinct, but I have sometimes doubted the wisdom of this, and therefore I am glad to be backed by your opinion.”⁶⁶ Years later, in 1869, Darwin would add that his “deception” as to the possible significance of single variation was brought about by “simple illustrations, as when man selects.”⁶⁷

The example from domestication was thus useful: the notion that traits could be passed on, for no apparent reason of utility to preservation, yet produce no “disadvantage.” Perhaps an analogous process was operating at the level of human consciousness; that is, characters or emotional or other tendencies were emerging through the intervention of additional, but not yet known, causal agencies. In the last essay in *Contributions...*, “The Limits of Natural Selection as Applied to Man,” Wallace describes characters that can only be maintained through such an additional causal agency as ones that “transcend time and space.”⁶⁸ He then notes parenthetically that “all of [these] were occasionally manifested at such an early period of human history as to be far in advance of the few practical applications which have since grown out of them.”

This kind of thinking appears in many of Wallace’s writings, starting well before his recognition of the natural selection principle. It is one of the most obvious signs of his lifelong commitment to final causes-based thinking. His already-mentioned understanding of vestigial biological structures as “rudimentary organs” in the 1855 “On the Law...” essay falls squarely within this perception. In the essay he refers to these as “apparent imperfections” and how most observers regard them as having no “apparent function.” He writes:

What are these for? What have they to do with the great laws of creation? Do they not teach us something of the system of Nature? If each species has been created independently, and without any necessary relations with pre-existing species, what do these rudiments, these apparent imperfections mean? There must be a cause for them; they must be the necessary results of some great natural law. Now, if, as it has been endeavoured to be shown, the great law which has regulated the peopling of the earth with animal and vegetable life is, that every change shall be gradual; that no new creature shall be formed widely differing from anything before existing; that in this, as in everything else

⁶⁶ Marchant, James, ed., *Alfred Russel Wallace: Letters and Reminiscences*. Harper & Brothers, 1916, on p. 108.

⁶⁷ *Ibid.*, p. 192.

⁶⁸ “The Limits of Natural Selection as Applied to Man.” In *Contributions to the Theory of Natural Selection* by A. R. Wallace (Macmillan, 1870): 332–371, on p. 358.

in Nature, there shall be gradation and harmony, – then these rudimentary organs are necessary, and are an essential part of the system of Nature . . .⁶⁹

It was sentiments of this kind that probably caused Darwin to ignore the essay initially: Wallace seemed to be invoking design more than process, or at the very least, process on the basis of design.

In one of his first publications after returning from the East, Wallace wrote:

...excessive cheapness of food is, contrary to what might be expected, a curse rather than a blessing. It leads to great laziness and the extreme of misery. The habit of industry not being acquired by stern necessity, all labour is distasteful, and the sago-eaters have, as a general rule, the most miserable of huts and the scantiest of clothing. In the western islands of the Archipelago, where rice is the common food of the people, and where some kind of regular labour is necessary for its cultivation, there is an immediate advance in comfort, and a step upward in civilization. This limited observation may be extended with the same results over the whole world; for it is certainly a singular fact that no civilized nation has arisen within the tropics. That rigour of nature which some may have thought a defect of our northern climes has, under this view, been one of the acting causes in the production of our high civilization. We may, indeed, further venture to suppose that, had the earth everywhere presented the same perennial verdure that exists in the equatorial regions, and everywhere produced spontaneously sufficient for the supply of men's physical wants, the human race might have remained for a far longer period in that low state of civilization in which we still find the inhabitants of the fertile islands of the Moluccas and New Guinea.⁷⁰

Here we see some plain indications of a notion that the potential to become civilized can evolve before environmental conditions arrive that can actualize such a potential. It is surely but a short step from this idea to the 1870 essay in *Contributions...* mentioned above, which states: “all of [these] were occasionally manifested at such an early period of human history as to be far in advance of the few practical applications which have since grown out of them.”

An even more obvious example of Wallace's “transcend time and space” line of thinking concerns his slant on the appearance of mediumistic powers. These were, he argued, like mathematical and artistic talents, not necessary to mere survival, and therefore not explainable through the action of natural selection. Their emergence prior to any use for them was suggestive of additional causal agencies. In 1888 he wrote:

There is another very interesting and important reason why there was, or appeared to be, a sudden cessation of the witchcraft phenomena. Witches, in our opinion, are persons who are peculiarly gifted, and what we now call mediums, and who during at least three or four centuries, were systematically persecuted and murdered. The result was that all having these peculiar gifts were exterminated out of the world, and the natural result was that the phenomena of which they were the cause was mediums, ceased to exist, till a fresh crop as it were of these peculiarly gifted individuals had grown up.⁷¹

⁶⁹ “On the Law Which Has Regulated the Introduction of New Species.” *Annals and Magazine of Natural History* September 1855: 184–196, on pp. 195–196.

⁷⁰ “On the Trade of the Eastern Archipelago With New Guinea and Its Islands.” *Journal of the Royal Geographical Society* 32, 1862: 127–137, on p. 136.

⁷¹ “If a Man Die, Shall He Live Again?” *Harbinger of Light* 1 September 1887: 3529–3534, on p. 3530.

Wallace took parallel positions on purely biological subjects. In 1891 he wrote the following, part of a book review of a work by C. Lloyd Morgan:

Connected with this question is that of the existence of useless specific characters, which are not and never have been correlated with useful characters. Mr. Morgan here very properly suggests that the difficulty is as to what is to give such useless characters any fixity, and without fixity they will not be classed as specific. In a later chapter ... he himself suggests a possible escape from this difficulty ... He supposes ... definite lines of variation, and that we may thus obviate the difficulty as to the origination of organs or structures whose first rudiments cannot be conceived to have been useful to their possessors. It seems to me probable that, however originated, there are such "lines of variation," and that some of the unknown laws of variation do lead to the initiation of the structures or organs which have been essential to the development of the varied types of the organic world; but I nevertheless maintain that this does not necessitate the acceptance of the doctrine of useless "specific" characters, or that of the formation of new species by isolation in an unchanged environment. For, by the assumption, these lines of variation and these nascent structures are produced by favourable combinations within the limits of a species. They appear more or less sporadically; they are at first of no utility; there is therefore nothing to give them fixity or to lead to their general and uniform development in all the individuals composing the species. Thus they must remain, sometimes dying out, sometimes advancing, till under some changed conditions of the environment they become of use in the struggle for existence. From that moment they become subject to the law of natural selection. All individuals not possessing these characters, or possessing them in too small a degree, are eliminated, leading at once to the steady increase of the character and its constant presence in all individuals of the species. It has now become a "specific" character, but only because it has become useful. The definite "line of variation" is now followed because it is a useful line. But, the moment it reaches a maximum of utility, elimination prevents any further development in that direction although the tendency may still exist, and variations which are now injurious may still continue to appear though they cease to be preserved.⁷²

Thus, "nascent structures" appear "sporadically," being "at first of no utility," until "under some changed conditions of the environment they become of use." But as he moved into his later years, he seems to have increasingly come to think that the "sporadic appearances" he speaks of were less sporadic at that: that *overall* there was a line of structural and organizational progress that indicated the action of more remote causes.

More examples of this "forward-looking" perspective on Wallace's part could be cited (extending from his earliest to latest writings), but I consider the point made. We need now to mention another element of his "additional causal agency" leanings.

It is often glossed over that even after 1858 Wallace continued to have suspicions as to the universality of operation of natural selection, even among just animals and plants. In the latter context, there were two particular worries. First, and as he remarked on several occasions, no one had any idea how "variation" came about. In that pre-genetics era it was merely known that characters varied in their size and other qualities; for natural selection to make sense this was the only fact that mattered. This was a problem, but it was probably one that both Wallace and Darwin expected would be solved some day in a

⁷² "Modern Biology and Psychology." *Nature* 12 February 1891: 337–341, on pp. 338–339.

manner that would not supersede the basic validity of the natural selection concept. There was a second kind of problem, however, that was more urgent. Although the logic underlying natural selection as a process seemed quite sound, it was difficult to demonstrate that other causalities affecting organic change were not also in effect, “aiding” it in some fashion. Darwin and Wallace took different routes in approaching this matter. Darwin was particularly worried about the phenomena of heredity. He suspected that in some circumstances there was inheritance of acquired characters, the old Lamarckian idea. He came up with a theory of heredity called “pangenesis” that in part dealt with this. It was quickly proved incorrect.

Wallace took a different approach. He did spend some time, especially in the 1890s, studying recent evidence regarding the transmission of acquired characters, but came down against it again, as he originally had as a young man. Still, if natural selection really was a universal influence, he had to be able to use it to explain all examples of adaptation. In dozens of papers and books he did just that, proposing relations between particular adaptive structures and their ostensible ecological/environmental causes. Wallace and Darwin sometimes disagreed on the causalities proposed (most famously on sexual selection), but given the complexities involved, this was inevitable. For some phenomena, however, neither he nor Darwin could come up with any explanation. This was true, for example, for the relation of certain aspects of mimetic/protective resemblance to the workings of natural selection.

The theory of protective resemblance states that in certain circumstances a selective advantage is accrued to those individuals that look like something else, and that the more they do, generally, the more advantage there is. The characteristics of the advantage vary; sometimes there is camouflage value that reduces likelihood of notice by enemies; sometimes there is value in resembling another creature that is dangerous or noxious. Wallace’s friend Henry Walter Bates was the first to work out the theory of mimetic resemblance, which addresses the latter situation (though Wallace also came up with some important ideas on the subject in the 1860s). Wallace’s own major contribution in this area was his elucidation of several of the main forms of protective coloration as they related to behaviors and concealment circumstances – and, ultimately, to the selection processes involved. Despite his successes in this direction, however, for many years he remained suspicious of the theory’s ability to explain all instances of color and pattern resemblances.

Wallace’s conservatism on this matter may have originated with some of his pre-natural selection views. During the early 1850s, influenced by Humboldtian ideas on natural interdependencies and reluctant to view causalities on the basis of the adaptive arrays of individual creatures, he had become convinced that the species divergence process was likely relatable to large-scale environmental forces. This understanding seemingly was consistent with the geographical/geological record of divergence (as set out in his “On the Law...” paper), and also with his knowledge that areas of similar climate often hosted completely different arrays of species populations with different adaptations. Through natural selection it was possible to understand these patterns, but, as his observations of human attributes demonstrated, it did not guarantee that all outcomes, including those perhaps more attributable to the origins of variation than to natural selection itself, were reducible simply to the operation of that principle.

In 1876 Wallace delivered an address at the annual meeting of the British Association for the Advancement of Science, one portion of which was entitled “On Some Relations of Living Things to their Environment.” Interestingly, this essay includes no discussion of natural selection; instead, he uses a number of examples to argue that “local influences” may be at work to explain observed characteristics of adaptation. He states: “Of all the external characters of animals, the most beautiful, the most varied, and the most generally attractive are the brilliant colours and strange yet often elegant markings with which so many of them are adorned. Yet of all characters this is the most difficult to bring under the laws of utility or of physical connexion.”⁷³ This appears to indicate he still has some doubts as to the extent to which natural selection could be applied to understand, as later in the essay he puts it, “those complex reactions between the vegetable and animal kingdoms, and between the organic world and the inorganic, which have almost certainly played an important part in determining many of the most conspicuous features of living things.” Again, the ghost of Humboldt was looming.

But several years later Wallace read the arguments of German naturalist Fritz Müller on his newly proposed form of mimicry, involving inedibility, that seemed to account for many of these apparent exceptions to the theory of protective resemblance. In an 1882 article Wallace wrote:

If these views are correct we shall have the satisfaction of knowing that all cases of mimicry are explicable by one general principle; and it seems strange to me now that I should not have seen how readily the principle is applicable to these abnormal cases . . . The chief thing required is an experimental proof of various degrees of inedibility in butterflies, during the different stages of their life-history; and also some observations as to the comparative abundance of the species of protected butterflies which mimic each other. If to this can be added the proof that such groups as *Catagramma*, which seem to be the objects of mimicry, are partially protected by inedibility, the chief remaining difficulty in the application of the theory of natural selection to all known cases of protective imitation will have been cleared up.⁷⁴

Despite natural selection’s continuing success at explaining more and more such relationships, Wallace continued to be convinced that many things were “evolving in spite of themselves.” In 1910, in his late work *The World of Life*, he makes the remarkable argument that the color patterns exhibited by many insects arise from selection imposed on them by animals of “higher organization” than themselves.⁷⁵ The line of reasoning here is not unlike his early distinctions between natural and “artificial” selection, to the extent that the higher entity (humans) is imposing a selection process on a lesser one (domesticated forms).

Wallace must have known that it would be very difficult in most instances to prove that an immediate “one cause-one effect” determinism actually existed between adaptation and selective cause. Before 1858, he had resisted the evidence of his own field work on this, largely because of his anti-utility bias. But after 1858 nothing had really changed: it was still difficult in any particular instance to demonstrate direct causality between character and cause. Wallace sometimes tread carefully when trying to do so, probably

⁷³ “On Some Relations of Living Things to Their Environment.” In *Report of the British Association for the Advancement of Science* 46 (John Murray, 1877): 101–110, on p. 101.

⁷⁴ “Dr. Fritz Müller on Some Difficult Cases of Mimicry.” *Nature* 25 May 1882: 86–87, on p. 87.

⁷⁵ *The World of Life*, Chapters 9 and 15. Chapman & Hall, 1910.

because he was unsure whether multi-causalities might be involved. Following his “The Origin of Human Races...” presentation to the Anthropological Society in 1864, he was somewhat elusive in this respect in responding to questions:

Then, another strong argument was that the Esquimaux, notwithstanding their bad climate, do not build good houses, not so good as Englishmen. I have asserted that man, in his progress from a low to a high state, would be assisted by the necessary discipline of a harsh climate, which would make him exert his mental faculties much more than a tropical climate. Now, I think that is almost self-evident, and is not at all affected by the fact that the Esquimaux are less intelligent than the English. The question is, “Do they build houses at all?” Yes; and very good ones. Travellers describe how ingeniously they build their snow houses; and the manner in which they make their clothing and sledges shows that they are not so low intellectually as most of the inhabitants of tropical countries. Mr. Reddie also wants to know how the intellect came at first. I don't pretend to answer that question, because we must go so long back. If Mr. Reddie denies that any animal has intellect, it is a difficult question to answer; but if animals have intellect in different proportions, and if the human infant, the moment it is born, has not so much intellect as an animal, and if, as the infant grows, the intellect grows with it, I do not see the immense difficulty if you grant the universal process of selection from lower to higher animals. If you throw aside altogether this process of selection, you need not make the objection about the intellect. Mr. Blake made a few objections, which may have some little weight. The principal was that we have no evidence to show that when one race, or nation, or people are exterminated, or driven out by another, the one that is so exterminated is necessarily inferior; and he wanted to show either by historic evidence or by remains of bodies that it is impossible to say that the Celtic was inferior to the Teutonic, or the Basque inferior to the race which drove them out. Now, it appears to me that the mere fact of one race supplanting another proves their superiority. It is not a question of intellect only, nor of bodily strength only. We cannot tell what causes may produce it. A hundred peculiarities, that we can hardly appreciate, may cause the one race to melt away, as it were, before the other. But still there is the plain fact that two races came into contact, and that one drives out the other. This is a proof that the one race is better fitted to live upon the world than the other. Mr. Blake says that there is no necessary correlation between man and his habitat; and he endeavoured to show that by proving that the thickness of the crania does not vary in accordance with the heat of the sun. No doubt such an objection is very easy to make; but we must consider, is it at all likely that we shall be able, by our examination, to appreciate this correlation, whatever it may be. For instance, you take two animals; one lives in a northern hemisphere, the other in a southern, – one in a wet country, the other in a dry one. Can you tell me why these two animals are fitted to live in their respective climates? They may be so closely allied that you can hardly find out their differences; and if you cannot find out the difference in animals which serves to adapt them to the climate, is it likely you can find out the difference in man? But there are facts which show that there is a correlation between man and his habitat. For instance, take the case of the inhabitants of West Africa, who stand the fever and malaria of that country; and it is the same in New Orleans. It is asserted in America, I believe, that one-fourth of black blood is enough to save the individual from the yellow fever in New Orleans. This is a striking case, I think, of correlation between man and his habitat. Then again, as to the prevalence of black skinned races in the tropical regions, I do not believe that there is any special production of the black skin by the heat of the sun; but I believe that because the black skin is correlative to the hot sun, the black-skinned constitution is best adapted to stand the diseases of the climate, and the process of natural selection has preserved them. If we find a people who are apparently not well adapted to stand the climate, we have some reason to believe that they are a comparatively

recent immigration into the country. My friend, Mr. Bates, who is not here, has supported this theory from his observations on the Amazon, asserting that the inhabitants of tropical America are a recent introduction. He comes to that conclusion from a great many peculiarities of manners and customs, and if so, it is a corroboration of the argument that races do become correlated to the climate in which they live...⁷⁶

In this running commentary Wallace argues that *some* correlations, at least, seem to exist between the varying physical nature of man and particular characteristics of the environment. Note, however, that he does not argue that *all* human features must be treated in this fashion.

It is these kinds of connections that explain why Wallace continued his studies of character utility, and how he could develop an increasingly teleological cosmology yet keep defending natural selection: as of 1858 it was impossible to gauge to what extent the immediate physical/biological environment determined utility function. As the years passed, in fact, he began to abandon some of his earlier arguments regarding “non-necessary” physical traits, as Malcolm Kottler pointed out in 1974.⁷⁷

In his 1886 essay “Physiological Selection” Darwin protégé George Romanes complained that natural selection “is not, strictly speaking, a theory of the origin of *species*: it is a theory of the origin – or rather of the cumulative development – of *adaptations*, whether these be morphological, physiological, or psychological, and whether they occur in species only, or likewise in genera, families, orders and classes.”⁷⁸ I would agree: it is one thing to pose that all adaptational arrays are “modified” through natural selection, and quite another to argue that all existing structures are *created* by natural selection. The former suggests in the main a negative feedback process, whereas the latter sounds more like positive feedback: that is, in the first case existing structures are modified by the pressures of external forces, and in the second structures are emergent and not entirely relatable to specific previous conditions. All of this leads me to suggest that the purpose of Wallace’s “On the Tendency...” was not what it was made out to be. Although it has come to be understood as a “new theory of evolution” (*i.e.*, by natural selection), it more probably was intended as an interim statement clearing the ground for an interpretation of evolutionary change that was not bound by the assumption that *all* adaptive characters – that is, including the human “higher attributes” – are directly related to the program of the immediate environment. Natural selection thus in effect became a “rule” that distinguished between those characteristics that were so related, and those for which additional explanation was necessary.

* * *

In 1870 Wallace wrote:

I have also endeavoured to show, how the same power which has modified animals has acted on man; and have, I believe, proved that, as soon as the human intellect became developed above a certain low stage, man's body would cease to be materially affected by

⁷⁶ “The Origin of Human Races and the Antiquity of Man Deduced From the Theory of ‘Natural Selection’.” *Journal of the Anthropological Society of London* 2, 1864: clviii–clxxxvi, on pp. clxxxii–clxxxiv.

⁷⁷ Kottler, Malcolm Jay, “Alfred Russel Wallace, the Origin of Man, and Spiritualism.” *Isis* 65, 1974: 144–192.

⁷⁸ Lesch, John E., Dec. 1975. “The Role of Isolation in Evolution: George J. Romanes and John T. Gulick.” *Isis* 66, 1975: 483–503, on p. 487.

natural selection, because the development of his mental faculties would render important modifications of its form and structure unnecessary. It will, therefore, probably excite some surprise among my readers, to find that I do not consider that all nature can be explained on the principles of which I am so ardent an advocate; and that I am now myself going to state objections, and to place limits, to the power of “natural selection.” I believe, however, that there are such limits; and that just as surely as we can trace the action of natural laws in the development of organic forms, and can clearly conceive that fuller knowledge would enable us to follow step by step the whole process of that development, so surely can we trace the action of some unknown higher law, beyond and independent of all those laws of which we have any knowledge.⁷⁹

Later in the same essay he goes on:

The inference I would draw from this class of phenomena is, that a superior intelligence has guided the development of man in a definite direction, and for a special purpose, just as man guides the development of many animal and vegetable forms. The laws [note plural “laws”!] of evolution alone would, perhaps, never have produced a grain so well adapted to man’s use as wheat and maize; such traits as the seedless banana and bread-fruit; or such animals as the Guernsey milch cow, or the London dray-horse. Yet these so closely resemble the unaided productions of nature, that we may well imagine a being who had mustered the laws of development of organic forms through past ages, refusing to believe that any new power had been concerned in the production, and scornfully rejecting the theory (as my theory will be rejected by many who agree with me on other points), that in these few cases a controlling intelligence had directed the action of the laws of variation, multiplication, and survival, for his own purposes. We know, however, that this has been done; and we must therefore admit the possibility that, if we are not the highest intelligences in the universe, some higher intelligence may have directed the process by which the human race was developed, by means of more subtle agencies than we are acquainted with. At the same time I must confess, that this theory has the disadvantage of requiring the intervention of some distinct individual intelligence, to aid in the production of what we can hardly avoid considering as the ultimate aim and outcome of all organized existence – intellectual, ever-advancing, spiritual man. It therefore implies, that the great laws which govern the material universe were insufficient for his production, *unless* [my italics] we consider (as we may fairly do) that the controlling action of such higher intelligences is a necessary part of those laws, just as the action of all surrounding organisms is one of the agencies in organic development.⁸⁰

As we will see in later chapters, some interpret these remarks as implying Wallace had changed his mind on natural selection, perhaps as a result of his adoption of spiritualism a few years earlier. However, it seems to me that Wallace might just as easily have expressed the same thoughts in 1864 – or even 1858 – as 1870. Why, then, didn’t he? I think it took him some years to collect and consider evidence of various sorts that, in parallel with the situation for domestic animals, mankind was evolving in ways influenced by “higher intelligences” without “ever becoming aware of it.” The essential element of Wallace’s cosmology with respect to man probably remained intact from at least as early as 1856 (the year of the orangutan essay) through to his 1870 publication of *Contributions...* In fact it may well have been for this reason that Wallace wanted to get

⁷⁹ *Contributions to the Theory of Natural Selection* (Macmillan, 1870): 332–333.

⁸⁰ *Ibid.*, pp. 359–360.

Darwin's and Lyell's comments on his theory before he attempted to publish: he believed it identified no more than the critical efficient cause of the process named in the paper's title, but did not yet explain why some characters could come into existence and be maintained despite their apparent inutility. It was possible that others, including Lyell (who Wallace must have understood was not a transmutationist) might object to this weakness.

Wallace may therefore actually have worried that his new theory would be criticized on the grounds that it attempted to explain "too much;" *i.e.*, the manner of emergence of all purely biological structures. Ironically, some critics of Wallace's model have in fact argued that it tried to explain too much, but not for the same reasons Wallace may have imagined (I refer to the commonly made objection that his approach is panselectionist). Other critics, meanwhile, have objected that it explained too little, by irrationally putting human change outside its causal realm. Wallace never acknowledged either complaint, viewing natural selection as no more nor less than the inescapable result of individually organized forces playing out within a limited domain. On a number of occasions he exhibited irritation at "judgment being passed on a theory of nature by its power to explain all mysteries,"⁸¹ and this is one reason he felt that way.

This is surely the reason why Wallace wrote almost nothing about the evolution of humankind between 1858 and 1864: he had little to add to what he had already said in 1856 on the relationship of continuity to utility, and there was no point in speculating further until a solution to the remote causality issue presented itself. It had been a long struggle. The loss of his collections on his way home in 1852 had robbed him of the chance to study them and perhaps unlock the secrets of evolution then, but he had gamely struggled on in another location, and eventually made a great scientific breakthrough. There was only one problem: the breakthrough he became recognized for was not quite the one he had made.

Biogeography

Much of what has been written about Wallace's biogeography, and there is quite a bit,⁸² dwells on three elements of his work on that subject. These are: his identification of the faunal discontinuity known as "Wallace's Line," his support of the faunal realms approach to biogeographic systematics, and his emphasis on dispersalism. Wallace's studies in biogeography are not emphasized in the present work, but a brief review of these three contributions, at least, seems in order.

"Wallace's Line" refers to an imaginary line that separates those Indonesian and Philippine islands lying on the shallow water Sunda Shelf from islands lying in generally deeper waters to the east. Wallace first described this line in his paper "On the Zoological

⁸¹ For some early examples of this recurring theme in his writings see: "Remarks on the Habits, Distribution, and Affinities of the Genus *Pitta*" (*Ibis* January 1864: 100–114, on p. 111); "The Origin of Human Races and the Antiquity of Man Deduced From the Theory of 'Natural Selection'" (*Journal of the Anthropological Society of London* 2, 1864: clviii–clxxxvii, on p. clxxxiv); *Contributions to the Theory of Natural Selection* (Macmillan, 1870, on p. 332); and "Natural Selection – Mr. Wallace's Reply to Mr. Bennett" (*Nature* 17 November 1870: 49–50, on p. 50).

⁸² See, for example: Bueno Hernández, Alfredo, & Llorente Bousquets, Jorge, *El Pensamiento Biogeográfico de Alfred Russel Wallace* (Academia Colombiana de Ciencias Exactas, Físicas y Naturales, 2003); and Michaux, Bernard, "Alfred Russel Wallace, Biogeographer" In Charles H. Smith & George Beccaloni, eds., *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace* (Oxford University Press, 2008): 166–185. Many other listings may be found at my *Alfred Russel Wallace Page* on the internet.

Geography of the Malay Archipelago" in 1859.⁸³ When Wallace visited some of the more eastern islands in the region in the mid-1850s he was surprised to find that the mammals and birds living on them were dominantly Australian in character, whereas farther west, on Sumatra, Java and Borneo, there were practically no Australian forms. Conversely, few Asian forms were to be found on the eastern islands, and few Australian forms on the western islands. Wallace (correctly) interpreted this pattern to be related to past geological events and the easier passage of organisms from Asia to the large western islands than to beyond that limit: even with sea-level changes, the waters to the east of the Line were deep enough to keep most forms from spreading in either direction. He was of course unaware that some of the islands were also moving horizontally, through continental drift, the result being a very complicated interaction history that is only now being worked out.

Meanwhile, while Wallace was collecting data on such relationships, ornithologist Philip Sclater published an article summarizing the worldwide patterns of distribution of birds.⁸⁴ To illustrate this, he identified what seemed to be the six main centers of distribution of birdlife, comprising North America (south to central Mexico), Latin America (north to central Mexico), Eurasia and North Africa minus South and Southeast Asia, Africa south of the Sahara, South and Southeast Asia, and Australasia. Thus, it was usually the case that particular species (and often genera and families) could conveniently be associated with one or two of these areas, which became known as "faunal realms." Wallace quickly adopted this scheme and over the years applied it to other groups, working it out in more detail. It became the basis for his massive two-volume work *The Geographical Distribution of Animals* in 1876.

It is clear that Wallace came to see this system as the last word in biogeographical systematics.⁸⁵ There were competing schemes, based on climatic and/or other ecological variables, but the Sclater/Wallace model remained the most popular descriptive vehicle for over a hundred years, and is still commonly referred to. But in the 1950s and 1960s revolutions in geology (plate tectonics) and biological systematics (cladistics) caused workers to look beyond its descriptive nature (and the plain fact that it did not adequately describe the nature of the distribution of lower animals and plants) for answers more befitting geological history and the relations of environment to species divergence.

Along with these new ideas, there was an increasing tendency to dismiss Wallace's evolutionary biogeography model in general, which seemed to be based on assumptions of speciation as related to dispersal. In the 1970s a new biogeographical model derived from cladistics emerged, vicariance biogeography. Cladistics itself differs from earlier approaches to classification⁸⁶ in dwelling on the historical process of divergence into new species (instead of the analysis of some arbitrary set of characters); vicariance is the

⁸³ *Journal of the Proceedings of the Linnean Society: Zoology* 4, 1860: 172–184.

⁸⁴ "On the General Geographical Distribution of the Members of the Class Aves." *Journal of the Proceedings of the Linnean Society: Zoology* 2, 1858: 130–145.

⁸⁵ See his "What Are Zoological Regions?" *Nature* 26 April 1894: 610–613.

⁸⁶ Actually, cladistics is more an approach to systematics than it is a form of classification, and a debate continues on how to reconcile this. Another way of putting this is to say that cladistics aspires to an accurate reconstruction of the family trees of all organisms, with little regard to the ecological function of the forms involved, or how that function elucidates particular evolutionary causalities.

biogeographical view of the process, set in space, over time. In the old model populations were thought to split into new forms as they dispersed, but in vicariance some change in the environment – perhaps splitting continents, or climate change or mountain-building – exerts a barrier effect *within* the range of an existing population, eventually causing an isolation effect – separation of gene pools – and then speciation.

Wallace's demonization in some quarters as an "old-fashioned dispersalist" is both deserved in some respects, and not deserved in others. It is also ironic, because it was Wallace himself who first brought attention to the historical patterns of divergence that vicariance biogeographers would later investigate. In his 1855 milestone paper "On the Law Which Has Regulated the Introduction of New Species" he introduced the concept that "Every species has come into existence coincident both in space and time with a closely allied species" (known as the "Sarawak Law," after where he was when he wrote the paper). The "space and time" part of this law refers to the notions that: (1) geologically, the fossil record shows that the forms most similar to one another occur in the closest (in time) geological units, and (2) geographically, the most closely related forms (when there are more than just a few) tend to have ranges extending near to one another. Thus, Wallace had recognized the principle of vicariance early on, at least with respect to diverging forms along single family lines.⁸⁷

This leads one to ask why Wallace abandoned this understanding in favor of a dispersalist slant. This is a complicated question, not for full exploration here, but a few ideas may be mentioned. To begin with, Wallace's experiences in the Malay Archipelago were with ... islands. In many or most cases, islands are populated by dispersing forms; these may rapidly change upon establishment, but the initiating action is dispersal. But beyond this there are at least two further considerations. First, while vicariant events – divergence in place, generally speaking – have undoubtedly been common over earth's history, there cannot be an evolutionary process that consists only of the splitting of populations into smaller populations. So dispersal must logically co-define the process. More importantly to Wallace, his recognition of the Sarawak Law only gave him a descriptive model of the *results* of evolution, not its causes. We still see this in the application of cladistics- and vicariance-based thinking: many or most practitioners do not concern themselves with other particulars of Darwinism (which they may or may not agree with), just those that project phylogenetic lineages whose occurrence in space and time can be documented. Wallace, however, was interested in developing theory in those other areas.

The Future Wallace?

All of this musing here on what Wallace was thinking and why he was thinking it should not merely be construed as an effort on my part to try to set history straight. As I stated in the Introduction, I am a firm believer in the idea that history can serve the future. But it can only do so if we have some reasonably clear idea of what actually went on, and, in turn, how this might provide some fresh ways of looking at things in our own time. I am not under the illusion that everything Wallace thought or wrote was right to the point, but I

⁸⁷ For discussion, see: Michaux, Bernard, "Alfred Russel Wallace, Biogeographer" In Charles H. Smith & George Beccaloni, eds., *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace* (Oxford University Press, 2008): 166–185.

would submit that not nearly enough attention has been given to his body of thought to just move on.

Although an argument might be made that this is true even for some of his more adventurous ideas (concerning, for example, his spiritualism), I will concentrate in this last section on some of his ideas on natural selection, and how they might be applied to a more enlightened biogeography in our time.

In 1888 the celebrated behavioral biologist C. Lloyd Morgan gave a presentation, later printed, that contained the following commentary:

Those who have read the recently published "Life of Charles Darwin" may remember a footnote in which Mr. A. R. Wallace criticizes the phrase "Natural Selection." "The term 'Survival of the Fittest,'" he says, "is the plain expression of the fact; 'Natural Selection' is a metaphorical expression of it, and to a certain degree indirect and incorrect, since Nature does not so much select special varieties as exterminate the most unfavourable ones." Mr. Darwin, while admitting with his wonted candour the force of this criticism, urges in support of the use of his own phrase, first, that it can be employed as a substantive governing a verb; secondly, that it serves to connect artificial and natural selection; and thirdly, that its meaning is *not* obvious, and that this leads men to think the matter out for themselves.

I propose here briefly to consider Mr. Wallace's criticism; to suggest provisionally the use of the phrase, "Natural Elimination," which *can* be employed as a substantive "governing a verb"; and to indicate the advantages which would attend the use of such a term, not the least of which is, that it serves to distinguish between artificial selection and "natural selection."

Mr. Herbert Spencer's term, "Survival of the Fittest," says Mr. Wallace, is the plain expression of the fact; "Natural Selection" is a metaphorical expression of it. Yes; but in the first place, Mr. Spencer's phrase gives no inkling of the process by which such survival is brought about; and, in the second place, it is questionable whether any phrase, which does so indicate the process, can escape the charge of being in some degree metaphorical. The sting of Mr. Wallace's criticism, therefore, would appear to lie (appropriately) in the tail, where he points out that Nature does not so much select special varieties as exterminate the most unfavourable ones. This seems to me a valid criticism; one which Mr. Darwin does not sufficiently meet; and one which still holds good. I would, however, venture to suggest that the word "eliminate," though somewhat metaphorical, is more satisfactory than Wallace's word, "exterminate"; and I further venture to suggest that the use of the phrase, *Natural Elimination*, would emphasize the fact that, whereas in artificial selection it is almost invariably the fittest which are chosen out for survival, it is not so under Nature; the "survival of the fittest" under Nature being in the main the net result of a slow and gradual process of the elimination of the unfit. The well-adapted are not selected; but the ill-adapted are rejected; or rather, the failures are just inevitably eliminated.⁸⁸

Morgan's posed new term "natural elimination" never caught on, but his point is an important one. As we have already seen, Wallace regarded artificial selection as "unnatural" for this very reason: it involved selection "for" traits that had no natural preservation value, whereas natural selection simply removed the "unfit" from the population in a manner that was not predetermined, eventually yielding new adaptations that, simply, "worked." The latter process, therefore, involved a system-level optimization,

⁸⁸ Morgan, C. Lloyd, "Elimination and Selection." *Proceedings of the Bristol Naturalists' Society* 5, 1888: 273–285, on pp. 273–274.

one in which all the populations in an area were constantly adjusting and re-adjusting in such a fashion as to perpetuate efficient flow of resources. In the Ternate essay Wallace describes, by analogy, how this evolving balance is established: *“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.”*⁸⁹

Wallace was apparently well aware of the distinction Morgan notes above. In an 1866 letter to Darwin he wrote “Natural Selection . . . does not so much select special variations as exterminate the most unfavourable ones.”⁹⁰ In fact, on a dozen or more occasions after that he also specifies his belief that natural selection is “really” the “extinction of the unfit” (sometimes he calls it the “elimination of the unfit”)⁹¹ – as opposed to, one supposes, the “survival of the fittest.”

Why then did he propose to Darwin that Darwin should refer to natural selection as the “survival of the fittest” to begin with? Well, there were the reasons as originally given, that the latter term more clearly identifies the nature of the process for the public, but Wallace probably had additional agenda. First, he probably felt that terms such as “natural elimination” or “elimination of the unfit” did not lend themselves to an understanding of “adapting” in an evolutionary sense. It is also not out of the realm of possibility that this was a sly joke on his part, an attempt to distance Darwin’s appreciation of natural selection from his own.

Rather late in life Wallace wrote: “Herbert Spencer suggested the term ‘survival of the fittest,’ as more closely representing what actually occurs; and 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.”⁹² Some years earlier he had commented:

This continual weeding out of the less fit, in every generation, and with exceptional severity in recurring adverse seasons, will produce two distinct effects, which require to be clearly distinguished. The first is the preservation of each species in the highest state of adaptation to the conditions of its existence; and, therefore, so long as these conditions remained unchanged, the effect of natural selection is to keep each well-adapted species also unchanged. The second effect is produced whenever the conditions vary, when, taking advantage of the variations continually occurring in all well adapted and therefore populous species, the same process will slowly but surely bring about complete adaptation to the new conditions.⁹³

Here we see, quite clearly stated, Wallace’s position that even under the conditions of an unchanging environment, natural selection will serve to keep populations in “the highest

⁸⁹ “On the Tendency of Varieties to Depart Indefinitely from the Original Type.” *Journal of the Proceedings of the Linnean Society: Zoology* 3, 1858: 53–62, on p. 62.

⁹⁰ Marchant, James, ed., *Alfred Russel Wallace: Letters and Reminiscences*. Harper & Brothers, 1916, on p. 141.

⁹¹ Smith, Charles H., “Alfred Russel Wallace and the Elimination of the Unfit.” *Journal of Biosciences* 37, 2012: 203–205.

⁹² “The World of Life: As Visualised and Interpreted by Darwinism.” *Fortnightly Review* 85, 1909: 411–434, on p. 424.

⁹³ “Evolution.” In *The Progress of the Century* (Harper & Brothers, 1901): 3–29, on p. 26.

state of adaptation” through the “weeding” or “extermination” of the unfit. I believe there is a weakness in his reasoning here, however, especially as related to the idea that species will remain unchanged if the environment stays the same. As earlier shown, Wallace believed that many incipient adaptations emerged, either at random or for reasons unknown, and then either disappeared or eventually were worked on by natural selection to produce advantage-accruing adaptations. Note, however, that such incipient structures would sometimes by chance lead to such advantages, producing structural changes whether or not the environment had changed. The significance of this we will take up in a moment.

Wallace’s “highest state of adaptation” model was noticed many years later by the anthropologist Gregory Bateson, who in 1972 recognized in his Ternate essay “steam engine governor” analogy something quite interesting:

. . . 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 . . .⁹⁴

In a later collection Bateson added some further remarks: “If it had been Wallace instead of Darwin [who started the trend], we would have had a very different theory of evolution today. The whole cybernetic movement might have occurred one hundred years earlier as a result of Wallace’s comparison between the steam engine with a governor and the process of natural selection . . .⁹⁵

Bateson’s remarkable observations, though apparently made without knowledge of Wallace’s preference for treating natural selection as the “elimination of the unfit,” fit perfectly into that understanding. Still, and even if Wallace did recognize the principle (if not the terminology, or a conceptual framework) of negative feedback processes, this does not suffice to define a systems-based understanding of evolution, as evolution in general represents a breaking away from recursive feedbacks to create new structures. In the decade before Bateson’s writings, however, an important paper by Magoroh Maruyama⁹⁶ had been published that developed such a model. Maruyama describes how organisms take in and assimilate two kinds of information: deviation-countering processes (negative feedbacks) which tend to support equilibrium conditions, and deviation-amplifying processes (positive feedbacks), which cause systems to change, either in a direction of greater or lesser order. The coupling of such processes, known as a “push-pull” system, indicates how a living system might simultaneously be equilibrium-conserving and equilibrium-superseding, but the conditions under which directions “of greater or lesser order” might obtain were not treated by Maruyama, nor, as near as I can tell, later observers.

⁹⁴ Bateson, Gregory, *Steps to an Ecology of Mind* (Chandler Publishing Co., 1972): on p. 435.

⁹⁵ Bateson, Gregory, *Mind and Nature: A Necessary Unity* (Dutton, 1979): on p. 43.

⁹⁶ Maruyama, M. “The Second Cybernetics: Deviation-amplifying Mutual Causal Processes. *American Scientist* 51, 1963: 164–179.

In several writings⁹⁷ I have introduced a model addressing this matter, and it is in part a biogeographical one. The model employs Wallacian thinking as to the way characters are selected for or against, but only to the extent that this serves to keep populations in the “highest state of adaptation,” as earlier described. Adaptations are recognized as structures serving a throughput of energy and functional activity, but not, technically, as evolving features. Instead, they constitute “devices” with a potential for engagement with the environment, loosely defined (including other organisms). It is the changing process of engagement that actually represents evolution because: (1) this is how the overall system improves its internal access to flows of energy, information, and materials,⁹⁸ and (2) as a matter of biogeographical/ecological function, successful engagement of a population with its surroundings is spatially non-random: range change will tend to be in directions of less environmental stress, where the emergence and assignment of wholly new and more flexible adaptive structures will be more likely.

Our appreciations of the concept of environmental stress have historically been rather murky. With respect to the environment, it has often been the case that “more” has been viewed as “better.” One of the best examples of this is the notion that the tropical rainforest is a relatively less stressed community, as witnessed by its high precipitation levels and high species diversity. However, the productivity of the system is actually rather lower than some other ecosystems (for example, grasslands); the stress of high precipitation combined with high heat is such that the nutrients in the system are easily washed away unless they are physically stored for long periods in largely inaccessible biomass (in this case, trees). The result is a kind of selection that favors very specific relationships, and a degree of specialization that is not conducive to the emergence of truly new, and perpetuating, designs. At the other extreme, deserts, a similar set of circumstances obtains to the extent of the development of forms highly specialized to resist high heat and dryness.

In my Ph.D. dissertation, completed in 1984, I posed a particular model of environmental stress based on soil moisture budgets.⁹⁹ An index was developed in which either annual high surpluses or high deficiencies counted as high stresses; a multiplier was added to account for annual deviations from mean planet temperature (in very cold environments, turnover of organic materials is very slow, whereas in very warm environments it is “too fast” – again, requiring high levels of specialization to take part). The resulting values at a sample of locations across the entire central part of the United States were mapped, and an attempt made to relate these to the range boundaries of the several hundred species of mammals, reptiles, and amphibians that exist there (the theory being that the isolines of stress would tend to parallel the boundaries, suggesting a causal relationship between them and direction of dispersal). Most of the tests produced results consistent with the model.

⁹⁷ *The Dynamics of Animal Distribution: An Evolutionary/Ecological Model* (Ph.D. Dissertation, University of Illinois Champaign-Urbana, 1984); “A Contribution to the Geographical Interpretation of Biological Change” (*Acta Biotheoretica* 35, 1986: 229–278); “Historical Biogeography: Geography as Evolution, Evolution as Geography” (*New Zealand Journal of Zoology* 16, 1989: 773–785); “Wallace’s Unfinished Business” (*Complexity* 10, 2004: 25–32).

⁹⁸ Bejan, Adrian, “The Constructal Law of Design and Evolution in Nature.” *Philosophical Transactions of the Royal Society of London B* 365, 2010: 1335–1347.

⁹⁹ *The Dynamics of Animal Distribution: An Evolutionary/Ecological Model*. Ph.D. Dissertation, University of Illinois Champaign-Urbana, 1984.

More recently I attempted another test of the model. It will be remembered that earlier I criticized Wallace's understanding of how evolution would not take place if there were no changes happening in the environment; the model I am describing, by contrast, suggests that there is a greater potential for producing incipient adaptations leading to larger scale, longer term divergences where ambient stress levels are low and, as I have put it, there is less adaptive need to be in particular places at particular times to persist. Part and parcel of this notion is the idea that populations existing in such environments should tend to develop higher levels of variation that, upon coming into contact with new locales, would more tend to diverge into new species. I looked into this¹⁰⁰ by choosing a sample of thirty-five locations across my original study area, identifying all the mammal species that were present at each, and then determining for each species at each location how many subspecies had been identified for each *in general* (that is, across their entire range). This was then compared to the stress index value at each location, the hypothesis being that areas of low stress should tend to sponsor highly variable populations more likely to speciate. The correlation between stress index value and mean number of subspecies was high (and in a statistical sense "highly significant"): a Pearson correlation coefficient r of $-.89$ (with the right sign).

This is certainly not the only kind of test that could be applied to this model. In a recent publication I noted:

It would also be interesting to investigate this matter in terms of the so-called "Neutral Theory of Molecular Evolution" (as developed especially by Motoo Kimura and Masatoshi Nei¹⁰¹), as one can project that genetic drift would likely play a greater role in identifying new viable structures under a regime of low environmental stress of this type. Recent work by Wagner¹⁰² might also be relevant in this context, as stepwise mutation to the ends of adaptation in the sense he describes might also be more likely in environments which are not so dominated by being "in particular places at particular times." In sum, if it can be shown that range change in populations is nonrandom, and slowly tends in those (geographical) directions that permit integration into generalist-promoting ecological settings, then we will have an understanding of how complexification in an evolutionary sense works – that is, how the constraints on biological function are lifted, rather than imposed. Such processes will undoubtedly be relatable to certain conditions of the environment, but it will probably be some spatial/temporal integration of these that will constitute the driving force, and not just large or small amounts of one thing or another.¹⁰³

Wallace may no longer be with us, but he can still generate ideas, if we give him a chance.

Chapter Four. Wallace and Darwin: The Ups and the Downs

Most people know of Wallace, if they know of him at all, through his connection to Darwin. After the hundredth time one reads the words, found everywhere, ". . . the theory

¹⁰⁰ As I considered this a pilot study it was not published, but may be viewed at: <http://people.wku.edu/charles.smith/once/dissadds.htm>

¹⁰¹ Kimura, M., *The Neutral Theory of Molecular Evolution* (Cambridge University Press, 1983); Nei, M., "Selectionism and Neutralism in Molecular Evolution" (*Molecular Biology and Evolution* 22, 2005: 2318–2342).

¹⁰² Wagner, A., "Neutralism and Selectionism: A Network-based Reconciliation" (*Nature Reviews Genetics* 9, 2008: 965–974).

¹⁰³ "Natural Selection: A Concept in Need of Some Evolution?" *Complexity* 17, 2012: 8–17, on p. 13.

of natural selection, as conceived by Darwin and Wallace,” it can almost be forgotten that these two were independent entities who might have remained that way but for an accident of fate.

It can hardly be denied that the Wallace-Darwin relationship was one which in the first instance led to a considerable elevation of status for Wallace, who until that point had been mostly “out of sight, out of mind.” For Darwin, however, the landing of Wallace in his life would lead to a whole range of emotional complications. Wallace appears to have been largely oblivious to the discomfort he caused Darwin, but then intrigue was not his forte. Still, on the whole Darwin benefitted greatly from Wallace’s involvement in his life, as the younger man not only provided the final impetus for his reshaping history, but became, on most matters, one of his two (the other being T. H. Huxley) most effective intellectual lieutenants.

Wallace and Darwin, Circa 1854 to 1862

In a 1903 article¹⁰⁴ Wallace described his first meeting with Darwin: “After my return from the Amazon in 1852, I was, in 1854, preparing for my visit to the Malay Archipelago by a study of the insects and birds of that region, when one day, I think very early in the year, I was introduced to Darwin in the Insect-room of the British Museum, and had a few minutes’ conversation with him, but I cannot recollect that anything of importance passed between us.” Apparently not, as Darwin later seems to have made no mention of the event in his writings at all. Later both were generally aware of each other’s interests, however, and exchanged letters in 1856 and 1857. Wallace’s have not survived. Darwin’s second letter, dated 1 May 1857, doesn’t give a full idea of what the previous Wallace letter might have contained, save that Wallace must have discussed his opinion that the nature of change in domesticated forms should be differentiated from that taking place under natural conditions. Wallace wrote again to Darwin on 27 September 1857; the latter’s response was dated 22 December 1857. Darwin reassures Wallace that his 1855 “Sarawak Law” paper has not been ignored, and in fact has been thought highly of by some good men. He promises to have a look at Wallace’s most recent paper (on the natural history of the Aru Islands), and expresses his admiration for Wallace’s perseverance.

This might have been the end of their relationship had it not been for Wallace’s breakthrough at (or near) Ternate in February 1858. As the now well-known story goes, Wallace had been laid up with a bout of malarial fever, and during it finally was able to find the critical piece to the evolutionary puzzle. As soon as he was well enough, he sat down and wrote out an essay describing what we now term (using Darwin’s vocabulary) natural selection. Well, wasn’t this exciting! But what if he had forgotten something important? Rather than attempting to publish immediately, perhaps it would be prudent to get the opinions of some veteran thinkers first. Wallace had published some criticism of the opinions of Charles Lyell on biogeographical matters that bore on evolutionary matters the year before, but he had never met Lyell, nor corresponded with him. Lyell’s reputation at that point, moreover, was greater than Darwin’s, and writing directly to him might have been viewed as a slight bit pushy. He knew Darwin was interested in such things,

¹⁰⁴ “The Dawn of a Great Discovery (My Relations with Darwin in Reference to the Theory of Natural Selection).” *Black and White* 17 January 1903: 78.

however, so perhaps the best strategy would be to send the essay to Darwin for comment, and possible forwarding to Lyell. And this is what he did.

This set into action a series of events discussion on which has carried down to the present day. The simple version goes like this.

In June 1858 Darwin is still plodding along on his planned multi-volume treatise on natural selection: a work designed to bury dissenters with multiple lines of cogent reasoning backed by reams of example. He is still years away from finishing. Then the mail brings another communication from his correspondent Mr. Wallace in the Malay Archipelago. He opens the missive, finding it contains both a short personal letter and a medium-sized essay entitled "On the Tendency of Varieties to Depart Indefinitely from the Original Type." From even a superficial study of the work it is obvious that Mr. Wallace has beaten him to the punch: it contains a near perfect synopsis of his own thought train of the past twenty years. Darwin is crushed, but has enough sense to turn to two of his closest naturalist friends, Lyell and the botanist Joseph Hooker, for advice on what to do.

Being good friends of Darwin, and not of Wallace, Lyell and Hooker think over the matter, undoubtedly seeking a solution that will neither shut out their colleague, nor appear high-handed. Wallace's letter has not included a request that the paper be published if it was thought good enough, yet it is apparent to Lyell and Hooker that the only honorable thing to do, in fact, is to publish it. They come upon a solution: there happens to be a special meeting of the Linnean Society of London coming up shortly, and at it they will present two unpublished sketches on natural selection Darwin had written some time back, along with the new essay from Wallace. This occurs on 1 July 1858. Darwin is not there (two of his children are sick – one died), and of course neither is Wallace. The papers are published shortly thereafter.¹⁰⁵ Wallace does not even hear about the event until months later.

Nevertheless, everyone appears pleased. Darwin's priority on the matter has not been compromised, and Wallace seems grateful for having his work taken so seriously by such important figures.

Yet there are some problems with this simple version. To begin with, Wallace was not consulted about the reading and subsequent publication of his essay (though Lyell and Hooker implied that he was, in the published text). Apart from the more straightforward issue that no one bothered to get his permission to go ahead, there is a more important matter related to the actual content of the essay. That is, what if it was only an incomplete statement of his thoughts? Revolutionary as it was, he had said nothing about actually publishing it (later accounts by both Darwin and Wallace attest to this), and perhaps there were reasons for this beyond his merely getting an opinion on it. We will now never know.

We do know, however, that Wallace remained a bit uneasy with the circumstances of the publication of his paper, even just as he was aware of them. Although he never printed anything suggesting he was dissatisfied with the actual response of the main characters involved (*i.e.*, Darwin, Lyell, and Hooker), there is reason to believe he may have been a bit upset about having words put in his mouth as a result of the essay's premature

¹⁰⁵ "On the Tendency of Species to Form Varieties; and On the Perpetuation of Varieties and Species by Natural Means of Selection." *Journal of the Proceedings of the Linnean Society: Zoology* 3, 1858: 45–62.

publication. Consider the following remarks, part of a letter he sent to Adolf Bernhard Meyer in 1869 when Meyer sought Wallace's permission to translate the paper into German: "As soon as my ague fit was over I sat down, wrote out the article, copied it, and sent it off by the next post to Mr. Darwin. It was printed without my knowledge, and of course without any correction of proofs. I should, of course, like this act to be stated." The situation was in fact so stated when Meyer published the German version of "On the Tendency . . ." in 1870.¹⁰⁶ Later, when the original paper was reprinted in the collection *Natural Selection and Tropical Nature* in 1891, Wallace added a note (the only one he did): "And that of their offspring' should have been added. But it must be remembered that the writer had no opportunity of correcting the proofs of this paper." Then his original remark from 1869 was itself reprinted in 1895 when Meyer sent a letter to the journal *Nature* to draw readers' attention to Wallace's early description of his creative experience.¹⁰⁷

One would think this would have been enough, but several years later he again stated the situation in print: ". . . in the next two succeeding evenings [I] wrote it out in full, and sent it by the next post to Mr. Darwin . . . I also asked him, if he thought well of it, to show it to Sir Charles Lyell, but I said nothing about its publication."¹⁰⁸ In Volume One of *My Life*, published two years later, he brought up the subject yet again: "The paper is reprinted in my *Natural Selection and Tropical Nature*, and in reading it *now* it must be remembered that it was but a hasty first sketch, that I had no opportunity of revising it before it was printed in the journal of the Linnean Society."¹⁰⁹

One cannot help but think that Wallace is trying to tell us something here. Perhaps the paper said more – or less – than the full story, but he was forced to go along with the results as they played out.

On another issue . . . It is reasonable to expect that under these circumstances, the order of the three sketches read at the Linnean Society should have been: Wallace, Darwin, Darwin. Instead, it was Darwin, Darwin, Wallace. Surely the initiating work should have been placed first. It wasn't. But Wallace never expressed any displeasure at this.

Wallace was not privy to the correspondence among Darwin and his friends in 1858, and apparently little understood at that time the emotional distress Darwin had experienced in dealing with the arrival of his Ternate paper. He only gained some inkling when Darwin's son Francis started publishing some of his father's correspondence in 1887, including letters from that period. He was astonished.

But what Wallace discovered in this manner might well have been only the tip of the iceberg. Some sources have expressed their belief that Darwin actually stole material from Wallace's essay, primarily on the subject of divergence, and incorporated such into his drafts before getting in touch with Hooker and Lyell. This is a grave accusation, and it

¹⁰⁶ Meyer, Adolf Bernhard, *Charles Darwin und Alfred Russel Wallace. Ihre Ersten Publicationen über die "Entstehung der Arten" nebst einer Skizze Ihres Lebens und einem Verzeichniss Ihrer Schriften*. Eduard Besold, 1870.

¹⁰⁷ Meyer, Adolf Bernhard, "How Was Wallace Led to the Discovery of Natural Selection?" *Nature* 29 August 1895: 415.

¹⁰⁸ "The Dawn of a Great Discovery (My Relations with Darwin in Reference to the Theory of Natural Selection)." *Black and White* 17 January 1903: 78.

¹⁰⁹ *My Life* 1905, vol. 1, p. 363.

is one that still has not been resolved. A lot of writers have by this point weighed in on the matter; some of the primary individuals who have been involved are Stewart McKinney, Arnold Brackman, John Brooks, Roy Davies, and John van Wyhe and Kees Rookmaaker, and it is from their writings¹¹⁰ that most of what follows is derived.

It was McKinney who first raised the issue of a possible discrepancy between Darwin's account of the date of arrival of Wallace's materials and mailing times between Ternate and England, but it was Brackman whose research really attracted the attention of the conspiracy theorists. The letter from Darwin to Lyell first revealing the former's reception of Wallace's essay was dated "18th" (ostensibly, June), but the crux of the matter is whether Darwin actually received Wallace's materials then, or two weeks or more earlier. It has been pointed out by McKinney, Brackman, and others, that Wallace's manuscript, if it was posted March 9, 1858, should have reached Darwin around the same time that a letter Wallace had sent to his old friend Henry Bates's brother, Frederick, which arrived on June 3. If so, the question goes, what was Darwin doing with it for two weeks? Brooks pointed out that Darwin apparently added some 66 pages of material on species divergence to the "big" species book he was preparing in the weeks before his June 18 letter, and suggested that this new information was inspired by Wallace's communication; *i.e.*, that he used it without acknowledging so. Conveniently, the original manuscript, accompanying note, and mailing cover have long since disappeared, making any confirmation of dates handled through postmarks impossible.

The issue festered for many years, then was given a boost by the Davies book in 2008. Most recently an article by van Wyhe and Rookmaaker gave the conspiracy theory advocates a jolt, as these writers come to the conclusion that Wallace's packet could not have been sent on March 9, and instead was mailed on April 5. On March 9 Wallace was expecting a shipment of collecting materials, and included with them was a letter from Charles Darwin, the one telling him how "good men" such as Charles Lyell had taken notice of his Sarawak paper, and to take heart. Van Wyhe and Rookmaaker argue that since Wallace received the Darwin letter that day, he would not have had time to send out a reply, along with his essay, and therefore that these must have been sent the next time the mail came around, on April 5. They fortify their remarks with a statement "We have also found from Wallace's surviving correspondence from Ternate that he never replied to a letter by the same mail boat on which it arrived."

There are several possible problems with van Wyhe and Rookmaaker's argument, however. Consider Wallace's description of the event from *My Life*:

. . . I became convinced that I had at length found the long-sought-for law of nature that solved the problem of the origin of species. For the next hour I thought over the deficiencies in the theories of Lamarck and of the author of the "Vestiges," and I saw that my new theory supplemented these views and obviated every important difficulty. I waited

¹¹⁰ McKinney, H. Lewis, *Wallace and Natural Selection* (Yale University Press, 1972); Brackman, Arnold C., *A Delicate Arrangement; The Strange Case of Charles Darwin and Alfred Russel Wallace* (Times Books, 1980); Brooks, John L., *Just Before the Origin: Alfred Russel Wallace's Theory of Evolution* (Columbia University Press, 1984); Davies, Roy, *The Darwin Conspiracy; Origins of a Scientific Crime* (Golden Square Books, 2008); van Wyhe, John, and Kees Rookmaaker, "A New Theory to Explain the Receipt of Wallace's Ternate Essay by Darwin in 1858" (*Biological Journal of the Linnean Society* 105, 2012: 249–252); Davies, Roy, "How Charles Darwin Received Wallace's Ternate Paper 15 Days Earlier than He Claimed: a Comment on van Wyhe and Rookmaaker (2012)" (*Biological Journal of the Linnean Society* 105, 2012: 472–477).

anxiously for the termination of my fit so that I might at once make notes for a paper on the subject. The same evening I did this pretty fully, and on the two succeeding evenings wrote it out carefully in order to send it to Darwin by the next post, which would leave in a day or two. I wrote a letter to him in which I said that I hoped the idea would be as new to him as it was to me, and that it would supply the missing factor to explain the origin of species. I asked him if he thought it sufficiently important to show it to Sir Charles Lyell, who had thought so highly of my former paper.¹¹¹

To begin with, he mentions the next post, to “leave in a day or two.” Surely if there had actually been a delay of a month, he would have changed the narrative to incorporate that fact. Further, this is only one of six times Wallace later discussed the mailing of his manuscript, and in none of the other descriptions does he mention that it was delayed either. Considering that this was the single most important event in his life, it seems unthinkable that he would have committed such an oversight – and six times!

Van Wyhe and Rookmaaker, however, argue that the last sentence in the passage given above proves that Wallace must have sent the materials on a later mail boat, because as of the time Wallace received the 22 December 1857 letter from Darwin, he was unaware that Lyell had expressed any support for his work. But examine the wording in that last sentence, and ask yourself whether it sounds like Wallace is trying to describe why he was replying to Darwin’s letter, or more likely is just reminding the reader of his 1905 book of a fact he had stated several pages earlier in it; *i.e.*, that he had found out through a Darwin letter of Lyell’s enthusiasm. Also consider that in no later place I am aware of does Wallace himself clearly connect the fact of sending the materials to Lyell to any notion that he did so because of finding out at some point that Lyell found his work interesting.

Wallace in fact had good reason for seeking out Lyell, and through Darwin in particular. In his later writings Wallace describes his early contact with Darwin as being somewhat incidental, starting with the brief in-person meeting, and continuing to correspondence when he read accounts of his interests in the *Athenaeum*, a London journal. Wallace had been familiar with Lyell’s writings, on the other hand, for many years. And, importantly, he had just daringly criticized Lyell’s understanding of biogeography in an article he had published only a few months earlier, in December 1857. What would Lyell say to the new theory, and its possible relation to Lyell’s biogeography?

I conclude that the van Wyhe and Rookmaaker model is still problematic. Quite possibly, Wallace simply did exactly what he later said – six times – he did, write the essay in late February and/or early March, attach a letter to it asking that it be forwarded to Lyell if Darwin thought it worthy, and then send the lot out a few days later, on 9 March. We know that such a letter *could* have reached Darwin over two weeks earlier than 18 June, because, remember, one that Wallace *did* send on 9 March reached Frederick Bates, Henry’s brother, in England, on 3 June.

Obviously, if Darwin did receive Wallace’s manuscript earlier than he said he did, and used the additional time to pass off some of Wallace’s ideas as his own, this would be considered a serious moral/ethical lapse. For the moment we cannot comment further, however, as decisive evidence – in either direction – remains lacking.

¹¹¹ *My Life* 1905, vol. 1, pp. 362–363.

Wallace and Darwin, Circa 1854 to 1882

Darwin's first concern after the presentation at the Linnean Society, and the subsequent publication of the three essays, was how Wallace would respond to this unusual turn of events. Darwin needn't have worried, as Wallace was, on the whole, quite pleased with what had taken place. As he wrote home to his mother shortly after hearing about the Linnean events, "I have received letters from Mr. Darwin and Dr. Hooker, two of the most eminent naturalists in England, which has highly gratified me. I sent Mr. Darwin an essay on a subject on which he is now writing a great work. He showed it to Dr. Hooker and Sir C. Lyell, who thought so highly of it that they immediately read it before the Linnean Society. This assures me the acquaintance and assistance of these eminent men on my return home."¹¹²

In a 24 December 1860 letter to Bates, sent after he had had a chance to read Darwin's *On the Origin of Species*, he wrote:

I know not how or to whom to express fully my admiration of Darwin's book. To him it would seem flattery, to others self-praise; but I do honestly believe that with however much patience I could never have *approached* the completeness of his book – its vast accumulation of evidence, its overwhelming argument, and its admirable tone and spirit. I really feel thankful that it has not been left to me to give the theory to the public. Mr. Darwin has created a new science and a new philosophy, and I believe that never has such a complete illustration of a new branch of human knowledge been due to the labours and researches of a single man. Never have such vast masses of widely scattered and hitherto utterly disconnected facts been combined into a system, and brought to bear upon the establishment of such a grand and new and simple philosophy!¹¹³

Darwin showed his relief in his first letter to Wallace after the publication of the natural selection essays: "I was extremely much pleased at receiving three days ago your letter to me and that to Dr. Hooker. Permit me to say how heartily I admire the spirit in which they are written. Though I had absolutely nothing whatever to do in leading Lyell and Hooker to what they thought a fair course of action, yet I naturally could not but feel anxious to hear what your impression would be."¹¹⁴ In a following letter, he adds as a postscript: "You cannot tell how much I admire your spirit, in the manner in which you have taken all that was done about publishing our papers. I had actually written a letter to you, stating that I would not publish anything before you had published. I had not sent that letter to the post when I received one from Lyell and Hooker, *urging* me to send some MS. to them, and allow them to act as they thought fair and honourably to both of us. I did so."¹¹⁵ Several further letters were exchanged before Wallace returned to England in the spring of 1862; these became increasingly casual.

It was inevitable that Wallace would come to visit Darwin at his residence at Down, in Kent, after his return, and this took place during the middle of the summer of 1862. Everyone must have been on best behavior, but despite the probable high levels of tension

¹¹² Marchant, James, ed., *Alfred Russel Wallace: Letters and Reminiscences*. Harper & Brothers, 1916, on p. 57.

¹¹³ Marchant 1916, *ibid.*, p. 59.

¹¹⁴ Marchant 1916, *ibid.*, p. 111.

¹¹⁵ Marchant 1916, *ibid.*, pp. 113–114.

the event seems to have gone well. Darwin had asked Bates, who had returned from South America in 1859 and was living in London, what Wallace was like, and apparently had received a positive report. Wallace had doubtlessly done the same kind of thing over the few months since his return. Down probably impressed Wallace immensely, the very epitome of the country gentleman's retreat, complete with gardens and research facilities. This was the kind of life Wallace now wanted; unfortunately, he was never quite able to attain it. Darwin was wealthy, having inherited considerable resources from his father, a successful doctor and investor. Wallace was not wealthy, and was not a very good manager of money.

It is interesting to consider the range of emotions Darwin might have felt during this meeting. Surely Darwin would have been delighted to hear Wallace's thoughts on a variety of subjects of interest to him; this was a rare opportunity for engagement at the highest level. But even if the "Darwin conspiracy" theory is much ado about nothing, he could not have helped but feel some pangs of guilt over his behavior, and that of his friends. Only weeks after the 1 July 1858 reading, he dropped work on his big volume and began piecing together the "abstract" of it that would become *On the Origin of Species*. Fifteen months later the finished product was in the bookstores, and beginning to shock or fascinate all who dared to read it. Wallace had been dropped from the picture; the book only refers to him a few times. Yet here he was at Down, alert, attentive, polite, and showing no apparent resentment over his marginalization. Darwin was not quite sure what to make of it all.

Again, this is allowing that there had been no additional intrigue. If the conspiracy theorists are correct, on the other hand, this visit could have been agonizing. How much had Wallace guessed? Would Wallace confront him at some point? What would he expect him to do to make amends?

But even had Wallace suspected intrigue, it seems unlikely he would have confronted Darwin on the matter. Apart from the fact that Wallace was a true gentleman and not prone to antagonistic behavior, it would have benefitted him very little to make a fuss, privately or in public. He had not just spent twelve years wandering around hot, steamy, snake-infested jungles, just to lose his newly-achieved status to a temper tantrum. But beyond this, any confrontation between the originators of natural selection so soon after its introduction might have had a chilling effect on its reception, and Wallace certainly wouldn't have wanted that. Besides, he undoubtedly felt that Darwin deserved credit for his prior twenty years of study of the concept. In any case, Wallace had his own way of getting back: he was a genius.

I am not suggesting that Wallace came to look at Darwin as a target for his frustrations (if there ever were any), just that though awed by Darwin, he was not *overawed*. There is an interesting passage in *My Life* in which he describes how, once he felt he had grasped the essentials of a particular problem, he was confident enough of his reasoning abilities never to back down in an argument, even when confronting the greatest of thinkers. Nowhere does this show better than in his dealings with Darwin. He regarded Darwin as a leader and inspiration, but not to the extent that he went along with all of his conclusions. Darwin would find this out in due course.

For a few years after returning from the East, Wallace mainly tended to his collections, and wrote the occasional essay on evolutionary and biogeographical subjects. His first natural selection-related essay, supporting Darwinian theory on the matter of cell construction in beehives,¹¹⁶ was published in late 1863 – rather remarkably, over five and one half years after his writing of the Ternate essay. Soon, however, he was regularly contributing defenses and developments of Darwinian theory, two of the most notable being an essay on the evolution of human races in March 1864,¹¹⁷ and a couple of weeks thereafter a monograph on mimicry and polymorphism in butterflies.¹¹⁸ During the same period Wallace and Darwin struck up a lively correspondence, mostly on professional matters, but extending to various pleasantries as well. It seemed they were charting largely the same path.

But around 1866 Wallace began to show his true colors. About the same time he was becoming a convert to spiritualism, he began to question elements of Darwin's theory of sexual selection. In particular, he began to doubt that bright colors in male birds had evolved as the result of female birds preferring brighter and/or more elaborately colored male individuals. Instead, he suggested that many birds had started off brilliantly colored, with the females evolving dull coloration as a protective device aiding in nesting and the raising of young. Later, he would take a modified position, theorizing that female choice of some more brightly colored males was connected to those individuals additionally having healthier constitutions. Thus, females were not making an aesthetic choice, but one assessing the actual overall health of the individual as indicated by robustness of color and behavior. The question still has not been fully resolved, though it seems both Darwin and Wallace have been shown correct, according to particular instances of adaptation.

Correspondence between Wallace and Darwin on this subject went on for years, and the longer it did, the more difficult it became for Darwin. At one point Wallace, sensing his colleague's distress, wrote to him:

I am sorry to find that our difference of opinion on this point is a source of anxiety to you. Pray do not let it be so. The truth will come out at last, and our difference may be the means of setting others to work who may set us both right. After all, this question is only an episode (though an important one) in the great question of the origin of species, and whether you or I are right will not at all affect the main doctrine – that is one comfort. I hope you will publish your treatise on Sexual Selection as a separate book as soon as possible, and then while you are going on with your other work, there will no doubt be found someone to battle with me over your facts, on this hard problem.¹¹⁹

Eventually discussion of the subject between the two fell off, but not before a more serious rift had opened. Wallace's adoption of spiritualism in late 1866 brought with it a new boldness on his part concerning the origin of humankind's higher faculties. This will be more fully discussed in Chapters Five and Six; for the moment we will only note again

¹¹⁶ "Remarks on the Rev. S. Haughton's Paper on the Bee's Cell, and on the Origin of Species." *Annals and Magazine of Natural History* October 1863: 303–309.

¹¹⁷ "The Origin of Human Races and the Antiquity of Man Deduced From the Theory of 'Natural Selection'." *Journal of the Anthropological Society of London* 2, 1864: clviii–clxx.

¹¹⁸ "On the Phenomena of Variation and Geographical Distribution as Illustrated by the Papilionidæ of the Malayan Region." *Transactions of the Linnean Society of London* 25, part I, 1865: 1–71.

¹¹⁹ Marchant 1916, *ibid.*, p. 189.

that in August 1868, at a meeting of the British Association for the Advancement of Science in Norwich, he gave the first indication of a split with Darwin on this subject. This was where he was described as saying “With regard to the moral bearing of the question as to whether the moral and intellectual faculties could be developed by natural selection, that was a subject on which Mr. Darwin had not given an opinion. He (Mr. Wallace) did not believe that Mr. Darwin’s theory would entirely explain those mental phenomena.”¹²⁰ But it was only about nine months later, in April 1869, that he had a chance to elaborate. He had been asked to write an essay review of new editions of Charles Lyell’s *Principles of Geology* and *Elements of Geology* for the *Quarterly Review*, and he ended this work with a few pages describing his view that:

While admitting to the full extent the agency of the same great laws of organic development in the origin of the human race as in the origin of all organized beings, there yet seems to be evidence of a Power which has guided the action of those laws in definite directions and for special ends. And so far from this view being out of harmony with the teachings of science, it has a striking analogy with what is now taking place in the world, and is thus strictly uniformitarian in character. Man himself guides and modifies nature for special ends. The laws of evolution alone would perhaps never have produced a grain so well adapted to his uses as wheat; such fruits as the seedless banana, and the bread-fruit; such animals as the Guernsey milch-cow, or the London dray-horse. Yet these so closely resemble the unaided productions of nature, that we may well imagine a being who had mastered the laws of development of organic forms through past ages, refusing to believe that any new power had been concerned in their production, and scornfully rejecting the theory that in these few cases a distinct intelligence had directed the action of the laws of variation, multiplication, and survival, for his own purposes. We know, however, that this has been done; and we must therefore admit the possibility, that in the development of the human race, a Higher Intelligence has guided the same laws for nobler ends.¹²¹

Darwin was horrified and told Wallace so by letter just after the review came out. Wallace responded:

I can quite comprehend your feelings with regard to my “unscientific” opinions as to Man, because a few years back I should myself have looked at them as equally wild and uncalled for. I shall look with extreme interest for what you are writing on Man, and shall give full weight to any explanations you can give of his probable origin. My opinions on the subject have been modified solely by the consideration of a series of remarkable phenomena, physical and mental, which I have now had every opportunity of fully testing, and which demonstrate the existence of forces and influences not yet recognised by science. This will, I know, seem to you like some mental hallucination, but as I can assure you from personal communication with them, that Robert Chambers, Dr. Norris of Birmingham, the well-known physiologist, and C. F. Varley, the well-known electrician, who have all investigated the subject for years, agree with me both as to the facts and as to the main inferences to be drawn from them, I am in hopes that you will suspend your judgment for a time till we exhibit some corroborative symptoms of insanity. In the meantime I can console you by the assurance that I don’t agree with the *Q. J. of Science* about bamboo, and that I see no cause to modify any of my opinions expressed in my article on the “Reign of Law.”¹²²

¹²⁰ Untitled. *Athenaeum* 19 September 1868: p. 373–374, on p. 374.

¹²¹ “Sir Charles Lyell on Geological Climates and the Origin of Species.” *Quarterly Review* 126, 1869: 359–394, on pp. 393–394.

¹²² Marchant 1916, *ibid.*, p. 200.

None of Darwin's immediate crew – Lyell, Hooker, Huxley, or protégés John Lubbock or George Romanes – would have anything to do with spiritualism. At one point Darwin was invited by his cousin Hensleigh Wedgwood to attend a séance and acceded, but then left abruptly before the main show started. Meanwhile, Wallace had been writing essays and publishing letters to the Editor on spiritualism and a number of social science subjects, becoming one of spiritualism's leading advocates, and an important voice for the concerns of average people. A major blowup occurred in 1876 when Wallace, that year's president of the biological sciences section of the British Association for the Advancement of Science, allowed a spiritualism-related paper to be presented at the annual meeting. This was resented by the more conservative elements of the scientific community, for some representing a last straw when it came to the matter of Wallace's respectability.

But, as mentioned earlier, 1876 was also the year of publication of Wallace's *Geographical Distribution of Animals*, and over the next few years, *Tropical Nature and Other Essays*, and *Island Life*. The last was dedicated to Hooker, one of his severest critics on spiritualism. When he found out about the dedication, Hooker must have softened. He wrote to Darwin, in disbelief, "that such a man should be a spiritualist is more wonderful than all the movements of all the plants" (an allusion to the title of Darwin's recent book *The Movements and Habits of Climbing Plants*).

Darwin and Wallace disagreed on a number of other subjects related to evolutionary biology and biogeography, and a couple of these are at least worth briefly noting here. In *My Life* Wallace reserves a small section to their differences; in addition to those on sexual selection and the evolution of humankind's higher qualities he notes: (1) arctic plants in the Southern Hemisphere, and on isolated mountaintops within the tropics (Wallace favored movement along mountain ranges, whereas Darwin believed that tropical lowlands cooled enough during the glacial periods to permit dispersal at low elevations and a later ascension to nearby high altitudes when warm conditions returned) (2) pangenesis, and the heredity of acquired characters (Darwin's theory of pangenesis was a failure; he also believed in the hereditary transmission of acquired characters). There were also several minor matters in biogeography on which they could not see eye to eye. Wallace's points of view on all these subjects have not fared badly over the years as compared with Darwin's, if one considers the "competition" in strictly scorecard terms.

On the whole it would appear that whatever he may have felt about his younger colleague's forays into spiritualism and politics, Darwin maintained a genuine respect for Wallace's reasoning abilities. This is shown by an act of his taken near the end of his life. In 1880 Wallace's friend Arabella Buckley, once Lyell's personal secretary, became concerned about the Wallace family's financial status. Wallace had been unable to find a regular position, and on assessing the degree of the problem she suggested to the powers involved that perhaps he could qualify for a pension from the Crown for his service to science. One of those powers was Darwin, who helped the matter along by writing a letter of support to the Prime Minister, William E. Gladstone. The petition was accepted, and Wallace got his pension. It was actually not a really large sum of money, amounting to two hundred pounds per year, but it helped (it has been noted that the amount in question was less than the Darwin family spent on meat each year).

Wallace's last letter to Darwin was dated 18 October 1881. In it he thanks Darwin for sending him a copy of his latest book, on worms,¹²³ makes a few remarks on leaf-mould, and encloses copies of couple of land nationalization writings he had just published. Darwin was not very interested in land nationalization. He died on the nineteenth of April, 1882; Wallace was one of the pallbearers at his funeral.

Interestingly, there has never been a full-scale study of the Wallace-Darwin relationship. It was a complex one, with many side-paths that can't be gone into here. For example, there was a fraud trial of the medium Henry Slade in 1876, and Wallace backed him with testimony on his behalf. Unbeknownst to Wallace, meanwhile, Darwin was helping the prosecution out with donations.

For most Darwin scholars, Wallace is merely a distracting complication, or even an annoyance. Darwin's work, after all, is the gold-standard of evolutionary studies. So much of what he concluded has turned out to be spot-on that it is sometimes difficult to believe there might be valid alternative points of view. Yet Darwin himself appeared to worry constantly over his differences with Wallace. Perhaps that alone should send a message.

Chapter Five. Wallace and Spiritualism: Final Causes Part Two

There can be no doubt that from about late 1866 on, Wallace was a full-fledged spiritualist. Spiritualism has some unusual qualities. Though it is basically a belief in an unseen universe of spirits, most of its followers view this universe as though it were a natural reality: it espouses no first causes, no omnipotent God figure, no literal heaven and hell, and no extended doctrine. The belief has diversified, of course, so that there are now followers who accept most Christian (or other religion's) tenets, and others who virtually practice ancestor worship or demonism. Largely, however, most spiritualists accept that other-worldly spirits exist who may be contacted, under favorable conditions, through spirit mediums operating through the séance circle, and whose influence is felt more regularly through dreams and other subliminal contacts.

It may surprise those of today, as it did people from his own time, that Wallace, in most respects an agnostic materialist who favored a pragmatic approach to the assessment of evidence, took up spiritualism. Many consider this to be his greatest weakness, a delusion that casts doubt on the worth of his other work. But the situation is more complicated than this oversimplification might lead us to believe.

Spiritualism: A Brief History

Forms of spiritualism have been with us since ancient times, but it was a series of events in the 1840s in New York State that led to the movement that came to be known as "modern spiritualism." In an article Wallace wrote for an encyclopedia in 1892, he describes this history:

The movement known as 'modern spiritualism' is usually considered to have commenced in the year 1848, with certain mysterious noises and movements occurring in a house temporarily occupied by Mr Fox and family at Hydeville in the state of New York; and his two daughters, Margaret and Kate, aged twelve and nine years respectively, were

¹²³ *The Formation of Vegetable Mould, Through the Action of Worms*. John Murray, 1881.

the first individuals recognised as mediums, in whose presence the phenomena more particularly occurred. It must not be supposed that the phenomena themselves were at all new. Throughout all history there are records of similar occurrences. Such were the disturbances at the ancient palace of Woodstock in 1649; at Mr Mompesson's at Tedworth in 1661; at Epworth parsonage in 1716, in the family of Mr Wesley, the father of the founder of Methodism; the Cock Lane ghost in London investigated by Dr Johnson, Bishop Percy, and other gentlemen; the extraordinary occurrences in the house of Mr Jobson in Sunderland in 1839, which were investigated and published by Dr Clanny, F.R.S., and authenticated by sixteen witnesses, including five physicians and surgeons; and numerous less important cases recorded in the works of William Howitt, Robert Dale Owen, Dr Eugene Crowell, and many older writers. But none of these occurrences attracted much attention or led to any systematic investigation of the subject. What especially distinguishes the year 1848 is that it was the starting-point of a movement which has grown and spread continuously, till, in spite of ridicule, misrepresentation, and persecution, it has gained converts in every grade of society and in every civilised portion of the globe. Spiritualism is now to be found as frequently among the highest aristocracy as among the middle classes and the poor. It has its full proportion of believers in the foremost ranks of science, literature, and art, and in all the learned professions. In every European country, in America, and in Australia there are numerous periodicals which diffuse a knowledge of its phenomena, its teachings, and its philosophy; while it claims to have profoundly modified the teaching of some among our clergy as to the nature and purpose of the future life. These facts and characteristics broadly distinguish modern spiritualism as being very different from anything that has preceded it, and claim for it a respectful consideration.

When the knockings and movements of furniture were first heard and seen they were assumed to be due to some trick or other natural cause, and there was in every case and throughout the whole course of the movement a strong prejudice against any other explanation of them. When the Fox family could not detect this cause the neighbours were called in, but equally without result. It was soon observed that the more violent sounds or motions occurred in the presence or in the immediate vicinity of one or other of the little girls, and every precaution was taken against possible trick on their part. They were closely watched, were held hand and foot, were tied in bags or put to stand barefooted on pillows, but all in vain. The raps or loud knockings on doors or tables, on floor or ceiling, occurred just the same. But this was only a part of the phenomena. It was observed that the noises occurred at request, or as if in reply to observations. Then the alphabet was used, and questions were answered by raps at certain letters which, when written down, formed connected words and sentences. In this way the statement was elicited that the sounds were made by the spirit of a man who had been murdered in the house and buried in the cellar. After several explorations human bones with charcoal and lime were discovered there. Some confirmatory evidence as to this murder was obtained, and some of the previous dwellers in the house stated that they also had been disturbed by unaccountable noises. The excitement caused by these occurrences was so great that in order to satisfy the curiosity of visitors the Fox family were obliged to submit to public exhibitions and tests of the remarkable phenomena occurring in the presence of their children, and thus public mediumship began. But at the same time other mediums were discovered in different parts of the country, as if a special development of this abnormal power were then occurring. . .

In 1845 an altogether illiterate youth, Andrew Jackson Davis, the son of a poor weaver and apprenticed to a shoemaker at Poughkeepsie, New York, began to exhibit remarkable powers as a trance speaker and a clairvoyant healer of diseases. During his trances he exhibited such extensive knowledge of subjects quite beyond his waking abilities or acquirements as to attract the attention of learned men, and under their auspices he

delivered in New York 157 lectures which were afterwards published in a volume of 800 pages. These powers have continued to be exerted during a long life. One of his disciples was Thomas Lake Harris, whose *Lyric of the Golden Age*, a poem of 384 pages, was dictated in ninety-four hours, and in the opinion of William Howitt deserves the praise that has been given it of possessing almost Miltonic grandeur. . . . ; and it was about the year 1846 that the celebrated medium Home, then thirteen years old, had his first vision of a boy friend, 300 miles away, who intimated to him that he had died three days before at a certain hour, which was afterwards found to be perfectly correct.¹²⁴

Word of these events spread rapidly and before long there were millions of spiritualists in America alone. Through the 1850s the movement gained strength in Britain and other places as well. Wallace's mention of "numerous periodicals" above does not do justice; in America alone there were hundreds of magazines and newspapers dedicated to spiritualist interests.

Wallace apparently first heard of the spiritualist movement while he was away in the East. Throughout his stay he continued to receive magazines from back home, perhaps as many as several at once. Through one or more of these he began reading about mediums, séances, and unusual "spirit manifestations." Although these did not make a strong impression on him then, at the same time he was observing with interest the various spiritual beliefs of the peoples he was encountering, many of which included an acceptance of spirits, ghosts, and other such entities. He had seen the same kinds of beliefs among the Indians of South America during his expedition there only a few years earlier. But it was not until he got back to England in 1862 that the opportunity or desire for investigation touched him.

Wallace's Adoption of Spiritualism

Wallace's adoption of spiritualism is a complex and interesting matter, and here we will look at it in two ways: in this chapter, in terms of the immediate steps of his adoption, and in the next, as a function of some overarching considerations.

For many years the chronology of Wallace's investigation, and then adoption, of spiritualism was uncertain. Malcolm Kottler placed the beginning of Wallace's interest to 1865, stating ". . . from 1862 to 1865 there is no evidence of any interest by Wallace in spiritualism."¹²⁵ But other dates have been mentioned. Wallace himself referred to the year 1862 at least twice: in his testimony in the fraud trial of medium J. N. Maskelyne in 1907, and in a late interview: "When I returned from abroad I had read a good deal about Spiritualism, and, like most people, believed it to be a fraud and a delusion. This was in 1862. At that time I met a Mrs. Marshall, who was a celebrated medium in London, and after attending a number of her meetings, and examining the whole question with an open mind and with all the scientific application I could bring to bear upon it, I came to the conclusion that Spiritualism was genuine."¹²⁶ Further, in a 1904 interview of him he is

¹²⁴ "Spiritualism." In *Chambers's Encyclopædia*, new ed., vol. 9 (William & Robert Chambers, 1892): 645–649, on p. 646.

¹²⁵ Kottler, Malcolm Jay, "Alfred Russel Wallace, the Origin of Man, and Spiritualism." *Isis* 65, 1974: 144–192, on p. 167.

¹²⁶ Northrop, W. B., "Alfred Russel Wallace" (interview). *The Outlook* (New York) 22 November 1913: 618–622, on p. 621.

quoted as saying: “from the year 1863, from the very beginning of his scientific career . . . [he] has been the avowed champion of spiritualism.”¹²⁷

But in *Miracles and Modern Spiritualism* he writes, with more weight of directness, “It was in the summer of 1865 that I first witnessed any of the phenomena of what is called Spiritualism, in the house of a friend.”¹²⁸ Later in the same work (p. 133) he mentions that his first séance took place “in the house of a friend” on 22 July; he also notes (p. 135) that the first of his several seances with the medium Mrs. Marshall took place in September 1865. The date 1865 is also implied in testimony Wallace provided in late 1876 at the Henry Slade fraud trial: “I have been investigating this subject for eleven years,” and in a letter of his printed in the London *Times* issue of 4 January 1873: “I began the investigation about eight years ago . . .”. Finally, it turns out that Wallace kept a “spiritualism notebook” in which he recorded the main details of his séances, and this does mention the 22 July date, and a visit to Mrs. Marshall at the end of September 1865.

Accepting that it was June or July of 1865 that Wallace began his serious investigation of spiritualism, the following words, recorded in a late interview, are of some interest: “Mrs. Marshall was at that time a celebrated medium in London, and after close examination I became convinced that the phenomena associated with her were perfectly genuine. But it took three years’ further investigation to satisfy me that they were produced by spirits.”¹²⁹ Many have assumed that Wallace simply became a spiritualist in 1865 as he took up the matter, but this is an error. Wallace’s allegiance to spiritualism developed in three rather clearly definable steps over an eighteen month period.

Wallace’s investigation of spiritualism was spurred both by immediate events, and a rational process of thought of which we will have more to say in the next chapter. In the more immediate direction, it is known that Wallace’s sister Fanny was already a convert, and that by mid-1865 she was suggesting that he investigate spiritualistic phenomena. Wallace, having years back satisfied himself of the legitimacy of mesmerism, another highly criticized phenomenon, was less likely to have resisted such pleadings, though at first he was skeptical. His first few séances elicited little in the way of convincing manifestations. Meanwhile, however, Wallace had also initiated a full-scale literature review of the spiritualism literature, soaking up, as he later put it, “almost everything I could obtain upon the phenomena.” That he did as he later said is apparent from his own writings on the subject, which make use of a great array of materials from writers both local and foreign.

In fact, and beyond his reading program, it would appear that for a full year Wallace shut down his scientific researches and put his full attention on the subject. A long paper on mimicry begun in 1865 was set aside for the time, and only published in 1867. A paper on pigeons published in the *Ibis* in the October 1865 issue may have actually been written some months earlier. Otherwise, no paper or letter by him reached print between 17 June 1865 and 19 May 1866, the longest stretch of his professional career with no literary

¹²⁷ Begbie, Harold, “Master Workers. XVII. – Dr. Alfred Russel Wallace” (interview). *The Pall Mall Magazine* September 1904: 73–79, on p. 77.

¹²⁸ *Miracles and Modern Spiritualism* (Nichols & Co., 1901), p. 132.

¹²⁹ “A Visit to Dr. Alfred Russel Wallace” (anonymous interview). *The Bookman* (London) January 1898: 121–124, on p. 123.

production. Further, he effectively ceased taking part in professional society functions (at least to the extent of making any presentations or comments at meetings) – this, despite the fact that in both the preceding and following one year periods he attended and spoke at at least eleven. Neither, though he attended, did he present at the fall 1865 British Association for the Advancement of Science meetings, something he had done in 1862, 1863, and 1864, and would do again in 1866, 1867, 1868, 1869, and 1870. Thus around June 1865 he had made a conscious decision to re-arrange his priorities for the time being.

But he was still in the stage of initial investigation. Months of séances, even with the professional medium Mrs. Marshall, had not produced any séance results over which he had full experimental control. Some of the séance manifestations were fairly impressive, but Wallace apparently was taking a conservative approach. By November of 1865 he apparently still had not committed himself to such an extent as to suggest that others also investigate. Important evidence on this comes from *The Spiritual News* issue of 1 December 1870. In this is a short note describing discussion that followed Wallace's first public address on spiritualism, "An Answer to the Arguments of Hume, Lecky, and Others, Against Miracles." The chairperson of the event is quoted as mentioning that "it was just five years ago" that he had initiated the lecture series which Wallace's address continued, and that at "the very first meeting held in that room in connection with Spiritualism, Mr. Wallace was present as a strong disbeliever." The meeting referred to took place on 6 November 1865.

On that date, 6 November 1865, the guest lecturer was Emma Hardinge, who had gained renown as an extemporaneous trance speaker. On this occasion, and several others over the following months, Hardinge spoke on themes that would have interested Wallace immensely. Consider the following quotations from her lecture of 6 November 1865, later published:¹³⁰

"In pointing to the analogy that exists between the great physical and spiritual laws of Earth, together with the modes in which they act, I have sought to shew you that all that man has called the supernatural, and classes as miracle, is but the out-working of an harmonious plan, which the mighty Spirit reveals through eternal laws; and the Spiritualism at which you marvel, and the Christianity before which you bow, are but parts of the same divine law and alternating life of order, which ever sees the day spring out of the darkest night." (p. 531)

"By Chemistry, man learns through scientific processes, to dissolve and re-compose in changed form, every existing atom. Time, instruments, and material processes alone are asked for the chemistry of science to accomplish these results. To the Spirit (whose knowledge comprehends all laws revealed to man) such chemistry is possible, and truly is achieved, *without* the lapse of time, or the aid of human science yet known *as such* to Man." (p. 532)

"Translated through the solemn utterance of dim antiquity all this is 'Miracle' – in simple modern science, it is 'Chemistry,' requiring only knowledge to effect these changes; in modern spiritualistic phrase 'tis mediumship, or chemistry employing subtler forces to effect in yet more rapid time and simpler modes than man's, the self-same changes which man

¹³⁰ "Miss Emma Hardinge." *The Spiritual Magazine* 6, 1865: 529–543. Hardinge's remarks on this and other occasions were compiled and published by F. Farrah in the Spring of 1866 as the short monograph *Extemporaneous Addresses*.

can make by science. To-day you listen to the tap, tap, of the electric telegraph of the soul; you translate into sentences that strange and grotesque form of telegraphy; you behold inscribed on the blank page the name of some beloved one written with no mortal hand; you feel the baptism of the falling water, you know not from whence; and the fragrance of flowers not gathered by mortal power appeals to your startled senses. You call this Spiritualism; and what is this but the chemistry of the spirit?" (p. 532)

"Truth is the discovery of God's law in any direction of enquiry." (p. 538)

Wallace, who, as we shall see next chapter, was looking for a way to understand spiritualism as a natural phenomenon, would have found this fascinating. Hardinge probably proved the critical influence in drawing Wallace deeper into spiritualism. He was now convinced enough to begin a program of trying to get his fellow scientists to take the matter seriously. A written work seemed to be the way to proceed.

This, I surmise, is how Wallace's first writing on spiritualism, "The Scientific Aspect of the Supernatural," came to be. This is a good-sized work, about 22,000 words long, and it probably took Wallace several months to prepare it – most of the first half of 1866. It was ready for publication no later than the middle of July 1866, and found its way into print in installments in *The English Leader*, a secular magazine, over an eight week period extending from 11 August through 29 September. This chronology is significant for its relation to Emma Hardinge's lecture series, the last one of which took place on 24 June 1866, just before Wallace was putting the finishing touches on his new study.

It should therefore come as no surprise that quotations from Hardinge make up over three full pages of the work; this is more than twice as much as for any other individual he cites, with the exception of Augustus De Morgan, a mathematician sympathizer. Hardinge (1823-1899) was well known to the spiritualist communities on both sides of the Atlantic at that point, and Wallace doubtless became familiar with her writings, including transcriptions of her lectures from years past. Wallace's quotations from Hardinge in "The Scientific Aspect of the Supernatural" are taken from her essay "Hades," one of her *Six Lectures on Theology and Nature*, published in 1860.

Wallace's main mission in "The Scientific Aspect of the Supernatural" is providing a literature review of the subject and erecting a philosophical argument for investigating its phenomena. He starts by pointing out that we have limited senses, and that we accumulate knowledge in a manner superseding earlier understandings based on claims of the miraculous. Continuing this line of thought, he then suggests that what we currently regard as "miracles" are non-miraculous aspects of nature that we don't yet understand. He next considers the notion of cryptic forces in nature, and from there sets out some of the historical records of spiritualistic phenomena. The work closes with a consideration of the theory and moral teachings of spiritualism in which he draws extensively from the writings of Hardinge.

One thing missing from "Scientific . . ." are any descriptions of his own investigations into the phenomena, which so far had produced mixed results. Wallace probably still did not feel wholly confident that he had been able to exert enough experimental controls to establish authenticity. His overall state of mind in presenting what he did is indicated in the following words appearing early in the text: ". . . Let us now return to the consideration of the probable nature and powers of those preter-human intelligences *whose possible existence only it is my object to maintain . . .*" [my italics]. At the point of publishing these

words, Wallace has come to believe the circumstances of the phenomena are worth studying, but he is still maintaining some objectivity in his consideration of the subject.

It is not impossible that Wallace had some trouble getting this work published, as *The English Leader* was not a heavily-read title. He may have taken what he could get. He must have asked himself how better to get the message out; the answer came as: reprint the articles as a pamphlet. Exactly when this was done is not certain; the range of possible dates seems to be about September 29 to November 15. The chronology involved is actually rather important, as it bears on his level of commitment to spiritualism at that point. It was very likely printed after September 29, the date its final installment appeared in the magazine. The typesetting of the pamphlet is the same as appeared in the latter, though there are a few notes and edits that were not in the serialized version. Most probably the latest it could have been sent to the printers was early- to mid-November, as a cover letter accompanying one of the one hundred copies made is known to have been sent to T. H. Huxley on the 22nd of that month.¹³¹

Importantly, it was during the month of November 1866 that Wallace found a medium who could produce startling results, and who as a novice was willing to hold séances in his own quarters. This was (Agnes) Elizabeth Nicholl (later Mrs. Guppy), whose skills as a photographer had attracted the attention of Wallace's sister Fanny, herself an amateur photographer. The Wallace family began to hold regular séances with her on Fridays, but it was not until the second one that impressive results were returned. Wallace's "spiritualism notebook" gives her first Friday session as occurring on 23 November, but this might only have been the first of the "Friday series." In any case, it is apparent that the Wallaces first connected with Nicholl right around the same time as the production of the spiritualism pamphlet. Up to this point, Wallace was not yet a convert to the cause; that is, he was still treating spiritualism from a strictly objective point of view.

Nicholl's séances over the next few months turned Wallace into a full convert; thus began the third stage of his relationship with the belief. In previous writings I have suggested that Wallace's conversion to spiritualism went through three steps, but now I am going to suggest there was actually a fourth step. If his full acceptance of spiritualism as a reality was completed by late 1866 or early 1867, it would take him another two years to get himself ready to take a position that not only was it real, but that other workers should take it into account in understanding the evolutionary process. "The Scientific Aspect of the Supernatural" had posed this as a possibility, but not more. He was now ready to go public with a break from Darwin on the origin of the higher human characters, but he needed a context.

Then, in September of 1868, a paper called "On the Failure of Natural Selection in the Case of Man"¹³² was published by a man named William R. Greg, who would later become an important early figure in the eugenics movement. Greg made an argument that our society's protection of the weak in body or mind has rendered natural selection an

¹³¹ Marchant, James, ed., *Alfred Russel Wallace: Letters and Reminiscences*. Harper & Brothers, 1916, on p. 417–418. In his letter Wallace also invites Huxley to take part in their private Friday séances. Huxley famously responded: "It may be all true, for anything I know to the contrary, but really I cannot get up any interest in the subject. I never cared for gossip in my life, and disembodied gossip, such as these worthy ghosts supply their friends with, is not more interesting to me than any other."

¹³² *Fraser's Magazine* 78, 1868: 353–362.

ineffective agent in furthering our evolution. Wallace was probably not amused to find that Greg used Wallace's own insistence (in his 1864 paper to the Anthropological Society) that in human beings selection had become re-focused at the level of the mind.

The paper drew a considerable reaction. A few weeks later one critic spoke against Greg's view, arguing:

The plan of God seems to be to ennoble the higher part of His universe at least, *not* so much by eliminating imperfection, as by multiplying graces and virtues. He balances the new evils peculiar to human life by infinitely greater weights in the scale of the good which is also peculiar to human life. 'Natural selection' has its place and its function, doubtless, even amongst us. But over it, and high above it, is growing up a principle of supernatural selection, by our free participation in which we can alone become brethren of Christ and children of God.¹³³

Wallace was not impressed by either this or the original argument, but then, in January 1869, another analysis was published that argued Greg and others had missed the point: selection was still going on, but changing as humans evolved:

. . . So with the communities of civilized men – the struggle is between one society and another, whatever may be the bond uniting such society: and in the far distant future we can see no end to the possible combinations or societies which may arise amongst men, and by their emulation tend to his development. Moral qualities, amongst the others thus developed in the individual necessarily arise in societies of men, and are naturally selected, being a source of strength to the community which has them most developed: and there is no excuse for speaking of a failure of Darwin's law or of 'supernatural' selection. We must remember what Alfred Wallace has insisted upon most rightly – that in man, development does not affect so much the bodily as the mental characteristics; the brain in him has become much more sensitive to the operation of selection than the body, and hence is almost its sole subject. At the same time it is clear that the struggle between man and man is going on to a much larger extent than the writer in 'Fraser' allowed. The rich fool dissipates his fortune and becomes poor; the large-brained artizan does frequently rise to wealth and position; and it is a well-known law that the poor do not succeed in rearing so large a contribution to the new generation as do the richer. Hence we have a perpetual survival of the fittest. In the most barbarous conditions of mankind, the struggle is almost entirely between individuals: in proportion as civilization has increased among men, it is easy to trace the transference of a great part of the struggle little by little from individuals to tribes, nations, leagues, guilds, corporations, societies, and other such combinations, and accompanying this transference has been undeniably the development of the moral qualities and of social virtues.¹³⁴

This time Wallace was impressed. In a 20 January 1869 letter to Darwin he wrote: "Have you seen in the last number of the *Quarterly Journal of Science* the excellent remarks on *Fraser's* article on Natural Selection failing as to Man? In one page it gets to the heart of the question." In the same letter he speaks of being asked to write a new work. In April 1869 this – the earlier-mentioned review of two new Lyell editions for the *Quarterly Review* – was published. Most of this work was a lengthy survey of evolutionary processes, and in it he expresses his opinion that a supranatural – nonphysical – causal element contributes to evolution. Many took him as implying there was yet a place for first

¹³³ Anonymous, "Natural and Supernatural Selection." *The Spectator* 41, 1868: 1154–1155, on p. 1155.

¹³⁴ Anonymous, "The Alleged Failure of Natural Selection in the Case of Man." *Quarterly Journal of Science* 6, 1869: 152–153.

causes – Godly intervention – in evolution, but this was not his intent. In a note in the 1871 second edition of his book *Contributions to the Theory of Natural Selection* he responded to this point as follows:

Some of my critics seem quite to have misunderstood my meaning in this part of the argument. They have accused me of unnecessarily and unphilosophically appealing to “first causes” in order to get over a difficulty – of believing that “our brains are made by God and our lungs by natural selection;” and that, in point of fact, “man is God's domestic animal.” An eminent French critic, M. Claparède, makes me continually call in the aid of – “*une Force supérieure*,” the capital F, meaning I imagine that this “higher Force” is the Deity. I can only explain this misconception by the incapacity of the modern cultivated mind to realise the existence of any higher intelligence between itself and Deity. Angels and archangels, spirits and demons, have been so long banished from our belief as to have become actually unthinkable as actual existences, and nothing in modern philosophy takes their place. Yet the grand law of “continuity,” the last outcome of modern science, which seems absolute throughout the realms of matter, force, and mind, so far as we can explore them, cannot surely fail to be true beyond the narrow sphere of our vision, and leave an infinite chasm between man and the Great Mind of the universe. Such a supposition seems to me in the highest degree improbable.

Now, in referring to the origin of man, and its possible determining causes, I have used the words “some other power” – “some intelligent power” – “a superior intelligence” – “a controlling intelligence,” and only in reference to the origin of universal forces and laws have I spoken of the will or power of “one Supreme Intelligence.” These are the only expressions I have used in alluding to the power which I believe has acted in the case of man, and they were purposely chosen to show, that I reject the hypothesis of “first causes” for any and every *special* effect in the universe, except in the same sense that the action of man or of any other intelligent being is a first cause. In using such terms I wished to show plainly, that I contemplated the possibility that the development of the essentially human portions of man's structure and intellect may have been determined by the directing influence of some higher intelligent beings, acting through natural and universal laws. A belief of this nature may or may not have a foundation, but it is an intelligible theory, and is not, *in its nature*, incapable of proof; and it rests on facts and arguments of an exactly similar kind to those, which would enable a sufficiently powerful intellect to deduce, from the existence on the earth of cultivated plants and domestic animals, the presence of some intelligent being of a higher nature than themselves.¹³⁵

And, lest one think that he changed his mind on this later, consider the following words from *My Life*, published in 1905: “Of course I do not adopt the view that each man's life, in all its details, is guided by the Deity for His special ends. That would be, indeed, to make us all conscious automata, puppets in the hands of an all-powerful destiny.”¹³⁶ He continues on:

But, as I shall show later on, I have good reasons for the belief that, just as our own personal influence and expressed or unseen guidance is a factor in the life and conduct of our children, and even of some of our friends and acquaintances, so we are surrounded by a host of unseen friends and relatives who have gone before us, and who have certain limited powers of influencing, and even, in particular cases, almost of determining, the actions of living persons, and may thus in a great variety of indirect ways modify the

¹³⁵ *Contributions to the Theory of Natural Selection*, 2nd ed. (Macmillan, 1871), pp. 372–372A.

¹³⁶ *My Life* 1905, vol. 1, p. 197.

circumstances and character of any one or more individuals in whom they are specially interested.

Earlier I suggested that Wallace's "The Scientific Aspect of the Supernatural" was designed as an argument for potential investigators that the phenomena they were dealing with were truly "natural." There are other places where he makes this point, however – for example in his other two most significant writings on spiritualism, "A Defence of Modern Spiritualism," and "An Answer to the Arguments of Hume, Lecky, and Others, Against Miracles." There are also the following words from the 1885 essay "Are the Phenomena of Spiritualism in Harmony With Science?":

Now, modern Spiritualism rests solely on the observation and comparison of facts in a domain of nature which has been hitherto little explored, and it is a contradiction in terms to say that such an investigation is opposed to science. Equally absurd is the allegation that some of the phenomena of Spiritualism "contradict the laws of nature," since there is no law of nature yet known to us but may be apparently contravened by the action of more recondite laws or forces. Spiritualists observe facts and record experiments, and then construct hypotheses which will best explain and co-ordinate the facts, and in so doing they are pursuing a truly scientific course.¹³⁷

I have written elsewhere:

This insistence on the "naturalness" of spiritualism forces us to confront the notion that it is not a religion – at least not in the usual sense of that term. Thus "The spiritualist, though he does not claim infallibility, believes he is dealing with facts; he insists that his faith is constructed to conform to the facts, as contrasted with a change of facts to conform to faith." This basis in what might be described as "psycho-naturalism" places spiritualism squarely within the realm of theosophy. *Webster's Seventh New Collegiate Dictionary* defines "theosophy" in its more specific sense as "the beliefs of a modern movement originating in the United States in 1875 and following chiefly Buddhist and Brahmanic theories especially of pantheistic evolution and reincarnation." Theosophy is actually not markedly in disagreement with materialist interpretations of evolution; in fact, it elucidates a process that both incorporates it, and extends beyond it.

Significantly, the view expressed in spiritualist (and other theosophical) writings is that the chain of natural causality extends continuously, and back and forth, between the psychic (*i.e.*, aspatial) and physical (*i.e.*, spatial) domains. The sensational manifestations of this continuity allegedly occurring during seances and analogous conditions are, it has usually been supposed, the only aspects of it whose causes might readily be distinguished from the ordinary "material" phenomena of nature. Wallace and other spiritualists argued that the evidence for at least some of the "miracles" that have allegedly occurred throughout human history is quite satisfactory, but that such events represent products of a natural (*i.e.*, non-"miraculous"), continuing interaction with "spirit beings" rather than otherwise wholly inexplicable first causes. Miracles were thus assigned natural causes – if one could accept that causal continuity in this instance was maintained by yet poorly understood, but nevertheless real, forces.¹³⁸

Of course most of the evidence of "spirit manifestations" was fleeting. Most spiritualists adopted the belief under the assumption that these "manifestations" indicated that a "spirit

¹³⁷ "Are the Phenomena of Spiritualism in Harmony With Science?" *The Medium and Daybreak* 16 December 1885: 809–810, on p. 809.

¹³⁸ Alfred Russel Wallace: *Evolution of an Evolutionist*, Chapter One.
<http://people.wku.edu/charles.smith/wallace/chsarw1.htm>

realm” really existed. Beyond this, there were its strong, positive, moral teachings. Additionally, some adherents claimed instructive personal experiences involving Swedenborgian out-of-body travel and revelations. But there were few events of this type that lent their way to the science of the time. Thus Wallace and others turned to the only thing they could do to scientifically investigate: trying to show that séance phenomena were, at least in some cases, genuine. To this end Wallace put a good deal of effort into inventing little tests that might expose fraud; he apparently rarely succeeded. Of course, this means that in many instances he probably was duped, but it must also be said that on some occasions, especially when he held sittings in his own quarters, fraud would have been difficult to achieve.

Let us next take a look, as a group, at five excerpts from Wallace writings on the teachings of spiritualism:

. . . The universal teaching of modern spiritualism is that the world and the whole material universe exist for the purpose of developing spiritual beings – that death is simply a transition from material existence to the first grade of spirit-life – and that our happiness and the degree of our progress will be wholly dependent upon the use we have made of our faculties and opportunities here . . . ¹³⁹

. . . we are, all of us, in every act and thought of our lives, helping to build up a mental fabric which will be and constitute ourselves in the future life, even more completely than now. Just in proportion as we have developed our higher intellectual and moral nature, or starved it by disuse, shall we be well or ill fitted for the new life we shall enter on. The Spiritualist who . . . knows that, just in proportion as he indulges in passion, or selfishness, or the reckless pursuit of wealth, and neglects to cultivate his moral and intellectual nature, so does he inevitably prepare for himself misery in a world in which there are no physical wants to be provided for, no struggle to maintain mere existence, no sensual enjoyments except those directly associated with sympathy and affection, no occupations but those having for their object social, moral, and intellectual progress – is impelled towards a pure and moral life by motives far stronger than any which either philosophy or religion can supply . . . ¹⁴⁰

. . . our condition and happiness in the future life depends, by the action of strictly natural law, on our life and conduct here. There is no reward or punishment meted out to us by superior beings; but, just as surely as cleanliness and exercise and wholesome food produce health of body, so surely does a moral life here produce health and happiness in the spirit-world . . . ¹⁴¹

. . . all the material imperfections of our globe, the wintry blasts and summer heats, the volcano, the whirlwind and the flood, the barren desert and the gloomy forest, have each served as *stimuli* to develop and strengthen man’s intellectual nature; while the oppression and wrong, the ignorance and crime, the misery and pain, that always and everywhere pervade the world, have been the means of exercising and strengthening the higher sentiments of justice, mercy, charity, and love, which we all feel to be our best and noblest

¹³⁹ “Spiritualism.” In *Chambers’s Encyclopædia*, new ed., vol. 9 (William & Robert Chambers, 1892): 645–649, on p. 648.

¹⁴⁰ “Why Live a Moral Life? The Answer of Rationalism.” In *The Agnostic Annual 1895* ed. by Charles A. Watts (W. Stewart & Co., 1894): 6–12, on p. 9.

¹⁴¹ *Ibid.*, on p. 12.

characteristics, and which it is hardly possible to conceive could have been developed by other means . . . ¹⁴²

. . . Not only is a healthy body necessary for a sound mind, but equally so for a fully-developed soul – a soul that is best fitted to commence its new era of development in the spirit world. Inasmuch as we have fully utilised and developed all our faculties – bodily, mental, and spiritual – and have done all in our power to aid others in a similar development, so have we prepared future well-being for ourselves and for them . . . ¹⁴³

Given these observations, all written after 1885, it is interesting to look back at some further passages from one of Wallace's earliest writings, the 1843 lecture on "the advantages of varied knowledge" discussed in Chapter 2:

[on gaining "a general acquaintance with history, biography, art, and science":] . . . There is an intrinsic value to ourselves in these varied branches of knowledge, so much indescribable pleasure in their possession, so much do they add to the enjoyment of every moment of our existence, that it is impossible to estimate their value, and we would hardly accept boundless wealth, at the cost, if it were possible, of their irrecoverable loss. And if it is thus we feel as to our general store of mental acquirements, still more do we appreciate the value of any particular branch of study we may ardently pursue . . . here we see the advantage possessed by him whose studies have been in various directions, and who at different times has had many different pursuits, for whatever may happen, he will always find something in his surroundings to interest and instruct him . . .

[on gaining "a knowledge of the elementary laws of physical science":] . . . He who has extended his inquiries into the varied phenomena of nature learns to despise no fact, however small, and to consider the most apparently insignificant and common occurrences as much in need of explanation as those of a grander and more imposing character . . . *He sees in every dewdrop trembling on the grass causes at work analogous to those which have produced the spherical figure of the earth and planets; and in the beautiful forms of crystallization on his window-panes on a frosty morning he recognizes the action of laws which may also have a part in the production of the similar forms of planets and of many of the lower animal types.* [my italics] Thus the simplest facts of everyday life have to him an inner meaning, and he sees that they depend upon the same general laws as those that are at work in the grandest phenomena of nature . . .

. . . It would be a curious and interesting thing to have a series of portraits taken of a person each successive year. These would show the gradual changes from childhood to old age in a very striking manner; and...might elucidate the problem of how far the mind reacts upon the countenance. *We should see the effects of pain or pleasure, of idleness or activity, of dissipation or study, and thus watch the action of the various passions of the mind in modifying the form of the body, and particularly the expression of the features* . . . [my italics] ¹⁴⁴

These and the previously quoted words of the twenty-year-old Wallace point toward what I have termed "the reasons for and advantages of pursuing an ongoing program of many-directioned self-education and rational, moral and intellectual exploration."¹⁴⁵ An

¹⁴² "Are the Phenomena of Spiritualism in Harmony With Science?" *The Medium and Daybreak* 16 December 1885: 809–810, on p. 810.

¹⁴³ "Spiritualism and Social Duty." *Light* (London) 9 July 1898: 334–336, on p. 335.

¹⁴⁴ *My Life* 1905, vol. 1, pp. 201–204.

¹⁴⁵ Alfred Russel Wallace: Evolution of an Evolutionist, Chapter 1.

<http://people.wku.edu/charles.smith/wallace/chsarw1.htm>

even earlier writing, from about 1841, expresses similar thoughts.¹⁴⁶ It is not difficult to detect a similarity between these sentiments and the ones expressed in the spiritualism-related passages appearing just above, the only obvious difference being the lack of referrals to an afterlife.

In what follows I draw heavily from my online monograph “Alfred Russel Wallace: Evolution of an Evolutionist,” Chapter One.¹⁴⁷ The reader is invited to consult this for additional examples to those given below.

Wallace’s philosophy rests on two basic ideas regarding cause and effect. First, the occurrence of action – any action – unaccompanied by equal and commensurate reaction is unthinkable. When exactly this element of Wallace’s thinking first established itself is uncertain, but his 1840s exposure to Charles Lyell’s *Principles of Geology*, with its uniformitarian geological philosophy, provided him with a view of cause-and-effect that appealed only to continuously-acting and, importantly, observable and verifiable, forces. It is likely, however, that the roots of this kind of thinking in Wallace’s mind extend much further back yet – perhaps to the period of his contact with a London-based Owenite group in 1837, as we shall discuss shortly.

Just as important to Wallace’s cosmology, however, were his views on justice, and its relation to causality. If only a limited range of “equal and commensurate” reactions were produced by any given cause, and if the consequences of any given cause were more or less restricted to some reasonably limited domain (including nature in general), then such consequences could be expected to turn back on the agent of causation. This was “just” – whether the feedback involved was of an immediately positive, constructive, nature or not.

Having such a dual foundation, Wallace was able to maintain a neutral, uniformitarian, starting point for his ideas on all subjects. As I have written:

Consider, for example, his views on morality. Those who could not see or understand the negative implications of their own actions were merely amoral, and even the bad implications themselves had the extenuating positive effect of providing instruction for any outside party receptive enough to benefit from such consideration. The relative morality of behaviors could thus be assessed, with adoption or rejection following as a function of considered appraisal. At the same time, however – and most importantly – one should not think that new and higher moral conceptions were constantly emanating from human beings *de novo*; this contradicted his ideas on continuity of cause and effect. Instead, such notions “come to us – we hardly know how or whence, and once they have got possession of us we can not reject or change them at will;” *i.e.*, they originate beyond the immediate domain of human consciousness, and are merely “applied” (or better yet, “redirected”) through human action.¹⁴⁸

The origin of Wallace’s position on the role of “just reaction” in progressive society is doubtlessly his early exposure to both Owens, and Paine’s *Age of Reason*. Philosophy turned to the practical when as a surveyor he took part in the Enclosure process, which deprived many of their access to the land. These earlier events were given focus when

¹⁴⁶ “An Essay, On the Best Method of Conducting the Kington Mechanic’s Institution.” In *The History of Kington* ed. by Richard Parry (n.p., 1845): 66–70.

¹⁴⁷ <http://people.wku.edu/charles.smith/wallace/chsarw1.htm>

¹⁴⁸ *Ibid.*

he was introduced to Spencer's "social justice" concept. Spencer reasoned that every individual should receive no more nor less – and especially no more – than was his or her just due. There is little difficulty understanding how this fit into Wallace's "Advantages . . ." philosophy: social evolution should be a progressive function of the most intelligently and morally conceived actions (*i.e.*, causes).

Actually, this notion of "just reaction" is not strictly a morality-based construct. Yes, it can be applied logically in many social directions to defend the rights of individuals, but more generally it reduces to a statement about uniformitarian forms of causation: that event C can always be explained as the result of causes A and B interacting in some particular way. It is but a short distance, therefore, to parallel positions within the natural sciences. So, and for example, Wallace could feel that biological adaptation was not more than the "just" result of the interplay of specific biological and environmental forces. In particular, a weak or maladapted individual was less likely to pass on its traits; meanwhile, the broadly adapted population was more likely to persist than the specialist. This, however, was a matter of ecology more than it was evolution. This occurred in response, additionally, to biological and extra-biological forces of whose causes and actions humans were still largely ignorant.

* * *

The point I am trying to make here is that the only feature distinguishing Wallace's developing philosophy of life from that later espoused by spiritualists was their assigning a rationale for moral behavior to a specific *final* cause – the "carrot" of a fair and just "afterlife." It thus should not come as any surprise that Wallace found the belief appealing, and once he verified that the "manifestations" were genuine, adopted it. It is fair to ask, however, whether we can actually observe in Wallace's writings over the years examples of his putting to use the sentiment that a many-directioned (and, when specifically referred to human beings, intelligently and morally-directed) experience is fundamentally valuable to the individual. In fact many examples can be pointed to. A few of these can be given here:

[on the implied basis for his assessment of the relative level of civilization attained by various native peoples . . .] The Dyaks are more lively, more talkative, and less diffident than the American [Indians], and therefore pleasanter companions. They have more amusements and are more social, while at the same time they have less variety of weapons, and are less skilful in their methods of obtaining game and fish. Both these circumstances will lead us to place them one degree higher in the scale of civilization . . . Dyak youths . . . have their social games, their trials of strength and skill . . . They possess . . . numerous puzzles and tricks with which they amuse themselves . . . These apparently trifling matters are yet of some importance, in arriving at a true estimation of their social state. They show that these people have passed beyond that first stage of savage life in which the struggle for existence absorbs their whole faculties, in which every thought and every idea is connected with war or hunting or the provision for their immediate necessities. It shows too an advanced capability of civilization, an aptitude to enjoy other than mere sensual pleasures, which, properly taken advantage of, may be of great use in an attempt to raise their social and mental condition.¹⁴⁹

¹⁴⁹ "Notes of a Journey Up the Sadong River, in North-west Borneo." *Proceedings of the Royal Geographical Society of London* 1, 1857: 193–205, on p. 204.

[on the “robustness” of natural forms of selection . . .] In the wild animal, on the contrary [*i.e.*, as contrasted with domesticated forms], all its faculties and powers being brought into full action for the necessities of existence, any increase [of power or capacity in an organ or sense] becomes immediately available, is strengthened by exercise, and must even slightly modify the food, the habits, and the whole economy of the race. It creates as it were a new animal, one of superior powers, and which will necessarily increase in numbers and outlive those inferior to it . . . Domestic animals are abnormal, artificial; they are subject to varieties which never occur and never can occur in a state of nature: their very existence depends altogether on human care; so far are many of them removed from that just proportion of faculties, that true balance of organization, by means of which alone an animal left to its own resources can preserve and continue its race.¹⁵⁰

[on the investigation of the true causes of death or injury . . .] It is only at a later period that we observe the tree to be suffering, and in the parts most affected we discover the Scolyti to have been at work, and erroneously impute the mischief to them . . . It now becomes a question whether the supposed criminals are not really our benefactors, – teaching us, by their presence, that there is something wrong, before we could otherwise perceive it. We may then be induced to inquire into the state of the soil or of the atmosphere, and be led to examine what diseases or what enemies may be at work on the roots or on the foliage of our trees as the points most likely for decay and death to originate in . . .¹⁵¹

[on understanding unfamiliar races or peoples . . .] I am convinced that no man can be a good ethnologist who does not travel, and not travel merely, but reside, as I do, months and years with each race, becoming well acquainted with their average physiognomy and their character, so as to be able to detect cross-breeds, which totally mislead the hasty traveller, who thinks they are transitions! . . .¹⁵²

[on the effort needed to access nature’s greatest treasures . . .] Nature seems to have taken every precaution that these, her choicest treasures [birds of paradise], may not lose value by being too easily obtained. First we find an open, harbourless, inhospitable coast, exposed to the full swell of the Pacific Ocean; next, a rugged and mountainous country, covered with dense forests, offering in its swamps and precipices and serrated ridges an almost impassable barrier to the central regions; and lastly, a race of the most savage and ruthless character, in the very lowest stage of civilization. In such a country and among such a people . . . they display that exquisite beauty and that marvellous development of plumage, calculated to excite admiration and astonishment among the most civilized and most intellectual races of man . . .¹⁵³

[on the success of civilizations being discouraged by insularity . . .] Civilisation has ever accompanied migration and conquest – the conflict of opinion, of religion, or of race. In proportion to the diversity of these mingling streams, have nations progressed in literature, the arts, and in science; while, on the other hand, when a people have been long isolated from surrounding races, and prevented from acquiring those new ideas which contact with them would induce, all progress has been arrested, and generation has

¹⁵⁰ “On the Tendency of Varieties to Depart Indefinitely From the Original Type.” *Journal of the Proceedings of the Linnean Society: Zoology* 3, 1858: 53–62, on pp. 60–61.

¹⁵¹ “Note on the Habits of Scolytidæ and Bostrichidæ.” *Transactions of the Entomological Society of London* 5, 1860: 218–220, on pp. 219–220. A good example of advice against jumping to conclusions.

¹⁵² *My Life* 1905, vol. 1, p. 366.

¹⁵³ “Narrative of Search After Birds of Paradise.” *Proceedings of the Zoological Society of London*, 1862: 153–161, on p. 160.

succeeded generation with almost the same uniformity of habits and monotony of ideas as obtains in the animal world . . . ¹⁵⁴

[on the desirability of looking at all sides of a matter . . .] There are speculations which are framed to support a foregone conclusion, and which ignore all but the one class of facts which may be deemed favourable. Such are altogether valueless, and deserve all the neglect that they can receive. But when the contriver of a hypothesis has no preconceived opinions to support, when he weighs and sets against each other all the conflicting facts and arguments which bear upon the question, and when his sole object is to discover what supposition will harmonise the greatest number of facts and contradict the fewest, then his speculations deserve some consideration, until they can be overthrown by positive evidence, or until some other hypothesis can be framed which shall, on similar grounds, be better worthy of acceptance . . . ¹⁵⁵

[on the undesirability of basing classifications of living things on single characters . . .] The Coniostres and Dentiostres . . . are professedly founded on one character only, and not on general structure; and it is therefore not to be wondered at, that in their attempts to pay some little regard to natural affinities, while forcing the genera and families into these divisions, no two naturalists should be able to arrive at the same results . . . ¹⁵⁶

[on the need to collect multitudes of information to come to accurate conclusions . . .] . . . my object has been to show the important bearing of researches into the natural history of every part of the world upon the study of its past history. An accurate knowledge of any group of birds or of insects, and of their geographical distribution, may assist us to map out the islands and continents of a former epoch; the amount of difference that exists between animals of adjacent districts being closely dependent upon preceding geological changes. By the collection of such minute facts alone can we hope to fill up a great gap in the past history of the earth as revealed by geology. ¹⁵⁷

[on the preferability of electing persons of a wide and long experience . . .] It has always seemed to me that the adoption of the minimum legal age which qualifies a person to hold property and to occupy the simplest public offices, as sufficient also to qualify for choosing the national representatives or for being chosen as a legislator, is a very great political blunder. With us, most men of twenty-one have only just finished, and many have not yet finished, their education, whether intellectual or industrial; while few persons at that age have given any serious thought to politics, have made any study of the duties and rights of citizens, or have had any real experience to guide them in forming an independent judgment on the various political and social questions of the day. In this respect, most savage and barbarous nations set us a good example: with them, it is the elders who rule; and the very name of chief is often synonymous with "old man." The most suitable age to be fixed as that of political maturity should certainly not be below thirty, while I myself consider forty to be preferable . . . ¹⁵⁸

Especially instructive is the following portion of a letter Wallace sent, while still in the field, to his brother-in-law, Thomas Sims, in 1861:

¹⁵⁴ "On the Varieties of Man in the Malay Archipelago." *Transactions of the Ethnological Society of London* 3 (n.s.), 1865: 196–215, on p. 206.

¹⁵⁵ *Ibid.*, pp. 214–215.

¹⁵⁶ "Attempts at a Natural Arrangement of Birds." *Annals and Magazine of Natural History* 18 (2nd s.), 1856: 193–216, on p. 196.

¹⁵⁷ "On the Physical Geography of the Malay Archipelago." *Journal of the Royal Geographical Society* 33, 1863: 217–234, on pp. 233–234.

¹⁵⁸ "How to Preserve the House of Lords." *Contemporary Review* January 1894: 114–122, on p. 118.

. . . You intimate that the happiness to be enjoyed in a future state will depend upon, and be a reward for, our belief in certain doctrines which you believe to constitute the essence of true religion. You must think, therefore, that belief is voluntary and also that it is meritorious. But I think that a little consideration will show you that belief is quite independent of our will, and our common expressions show it. We say, "I wish I could believe him innocent, but the evidence is too clear;" or, "Whatever people may say, I can never believe he can do such a mean action." Now, suppose in any similar case the evidence on both sides leads you to a certain belief or disbelief, and then a reward is offered you for changing your opinion. Can you really change your opinion and belief, for the hope of reward or the fear of punishment? Will you not say, "As the matter stands I can't change my belief. You must give me proofs that I am wrong or show that the evidence I have heard is false, and then I may change my belief?" It may be that you do get more and do change your belief. But this change is not voluntary on your part. It depends upon the force of evidence upon your individual mind, and the evidence remaining the same and your mental faculties remaining unimpaired – you cannot believe otherwise any more than you can fly.

Belief, then is not voluntary. How, then, can it be meritorious? When a jury try a case, all hear the same evidence, but nine say "Guilty" and three "Not guilty," according to the honest belief of each. Are either of these more worthy of reward on that account than the others? Certainly you will say No! But suppose beforehand they all know or suspect that those who say "Not guilty" will be punished and the rest rewarded: what is likely to be the result? Why, perhaps six will say "Guilty" honestly believing it, and glad they can with a clear conscience escape punishment; three will say "Not guilty" boldly and rather bear the punishment than be false or dishonest; the other three, fearful of being convinced against their will, will carefully stop their ears while the witnesses for the defence are being examined, and delude themselves with the idea they give an honest verdict because they have heard only one side of the evidence. If any out of the dozen deserve punishment, you surely agree with me it is these. Belief or disbelief is therefore not meritorious, and when founded on an unfair balance of evidence is blameable.

Now to apply the principles in my own case. In my early youth I heard, as ninety-nine-hundredths of the world do, only the evidence on one side, and became impressed with a veneration for religion which has left some traces even to this day. I have since heard and read much on both sides, and pondered much upon the matter in all its bearings. . . . I think I have fairly heard and fairly weighed the evidence on both sides, and I remain an utter disbeliever in almost all that you consider the most sacred truths. I will pass over as utterly contemptible the oft-repeated accusation that sceptics shut out evidence because they will not be governed by the morality of Christianity. You I know will not believe that in my case, and I know its falsehood as a general rule. I only ask, Do you think I can change the self-formed convictions of twenty-five years, and could you think such a change would have anything in it to merit reward from justice? I am thankful I can see much to admire in all religions. To the mass of mankind religion of some kind is a necessity. But whether there be a God and whatever be His nature; whether we have an immortal soul or not, or whatever may be our state after death, I can have no fear of having to suffer for the study of nature and the search for truth, or believe that those will be better off in a future state who have lived in the belief of doctrines inculcated from childhood, and which are to them rather a matter of blind faith than intelligent conviction.¹⁵⁹

The Sims letter beautifully connects Wallace's reasons for rejecting religion to his convictions regarding the value of belief. Belief had no intrinsic merit; only a continuing,

¹⁵⁹ Marchant 1916, pp. 65–67.

unbiased, examination of the facts pertaining to any given question resulted in values that were progress-serving. Superficial or prejudging evaluations generated actions likely to be inconsistent with the greater reality, and thus deserving of rejection by that reality.

As a result “progress” could only occur when individual persons were flexible enough to re-consider their positions in view of possible constructive changes. As the passage connected to note 154 shows, Wallace extended this understanding to the way society in general “progressed.” Nonhuman organisms operated in like fashion; that is, by adapting as possible to multiple environmental influences. In the biological context, of course, a “continual re-evaluation of position” was achieved rotely, through natural selection: the individuals or populations most capable of responding productively prevailing in the struggle for existence. Thus, progress – whether in the evolution of organisms or social systems – was facilitated by a wide-ranging experience (whether achieved deliberately, through conscious effort and openness, or probabilistically, as adaptive structures responding to impinging biological forces).

It is evident that Wallace came to an understanding of the way belief was connected to progress at an early age. Consider the following, from one of his very first published writings, the essay on mechanics’ institutions composed about 1841:

The correction of false ideas and incorrect opinions on well-known principles of science are not among the least benefits that would accrue from such a course as we have recommended. How many having imbibed a false opinion, and having embraced it for a time, as a certain and undoubted fact, are, on seeing it contradicted without a clear explanation, more apt to doubt the truth of the principle they have misunderstood, than willing to acknowledge that they have been so long in error. As the means of inciting to the acquirement of knowledge on all subjects, of creating a wish for information on what have been hitherto considered as abstruse branches of knowledge, but which are frequently among the most interesting and generally useful, – and of inspiring a desire for diving deeper into its inexhaustible stores not yet exposed to the scrutinizing gaze of man, such an institution as this, conducted in the way we have described, will be invaluable.¹⁶⁰

These early conclusions on the interrelationship of justice, merit and belief are fundamental to the directions Wallace’s thought took in 1858 and afterward. Remember, he had been considering such matters all the way back to his early exposure to the arguments of skeptics in his early teens. Early influences at that time included Thomas Paine’s *Age of Reason* and the writings of Robert Owen and his son Robert Dale Owen. He was especially impressed with a tract called *Consistency*, by Robert Dale Owen. The younger Owen had put together a convincing criticism of the doctrine of eternal punishment, and later in life Wallace noted that he “thoroughly agreed with Mr. Dale Owen’s conclusion, that the orthodox religion of the day was degrading and hideous, and that the only true and wholly beneficial religion was that which inculcated the service of humanity, and whose only dogma was the brotherhood of man.”¹⁶¹

As this is an important point, we need to put up a number of examples of how Wallace put the “no merit to uninformed belief” argument to direct use on later occasions:

¹⁶⁰ An Essay, On the Best Method of Conducting the Kington Mechanic’s Institution.” In *The History of Kington* ed. by Richard Parry (n.p., 1845): 66–70, on p. 69.

¹⁶¹ *My Life* vol. 1, pp. 88–89.

. . . we maintain that any temporary influence whatever, which would induce a man to vote differently from what he would have done by his own unbiassed judgment, is bad – that a man has a perfect right to uphold the interests of his class, and that it is, on the whole, better for the community that he should do so. For, if the voter is sufficiently instructed, honest, and far-seeing, he will be convinced that nothing that is disadvantageous to the community as a whole can be really and permanently beneficial to his class or party; while, if he is less advanced in social and political knowledge, he will solve the problem the other way, and be fully satisfied that in advancing the interests of his class he is also benefiting the community at large. In neither case, is it at all likely, or indeed desirable, that the temporary and personal influence of others' opinions at the time of an election, should cause him to vote contrary to the convictions he has deliberately arrived at, under the continued action of those same influences, and which convictions are the full expression of his political knowledge and honesty at the time? ¹⁶²

. . . We next find the broad statement that the idea of duty is not universal among men, but no evidence is offered, except that no one act is held to be a duty universally, or the contrary. But this is to mis-apprehend the real question, which is rather, whether there is any race of men among whom nothing is considered a duty. Is there any race with whom there are not certain acts which the majority do, or refrain from doing, independently of any fear of punishment, but because they believe them to be right or wrong? And is there, on the other hand, any race of animals whose actions are influenced in the same way? ¹⁶³

. . . The belief of a future life has been bound up with, and perhaps rested upon, the belief in the existence and occasional appearance on earth of spiritual beings, and the spirits of the dead, and of such popular phenomena as ghosts, visions, warnings, premonitions, etc. Beliefs of this nature prevailed almost universally up to about two centuries ago, when they came to a comparatively sudden end, and have since been treated by the educated in general as fables and superstitions, and this view has become so general and so ingrained that many people will not allow that the question is even open to discussion at all, even to admit the possibility of such phenomena as actual facts, but consider it the mark of ignorance and degrading superstition. This almost sudden revulsion of feeling (for it is a mere feeling, not belief founded on knowledge and enquiry) may be, I think, clearly traced to the current action of two powerful causes: one of them the witchcraft mania of the middle ages, the other the rise of physical science. ¹⁶⁴

. . . Religious belief would . . . furnish an adequate incentive to morality, if it were so firmly held and fully realised as to be constantly present to the mind in all its dread reality. But, as a matter of fact, it produces little effect of the kind, and we must impute this, not to any shadow of doubt as to the reality of future rewards and punishments, but rather to the undue importance attached to belief, to prayer, to church-going, and to repentance, which are often held to be sufficient to ensure salvation, notwithstanding repeated lapses from morality during an otherwise religious life. The existence of such a possible escape from the consequences of immoral acts is quite sufficient to explain why the most sincere religious belief of the ordinary kind is no adequate guarantee against vice or crime under the stress of temptation. ¹⁶⁵

¹⁶² "Public Responsibility and the Ballot." *Reader* 6 May 1865: 517.

¹⁶³ "Houzeau on the Faculties of Man and Animals." *Nature* 10 October 1872: 469–471, on pp. 470–471.

¹⁶⁴ "If a Man Die, Shall He Live Again?" *Harbinger of Light* (Melbourne) 1 September 1887: 3529–3534, on p. 3529.

¹⁶⁵ "Why Live a Moral Life? The Answer of Rationalism." In *The Agnostic Annual 1895* ed. by Charles A. Watts (W. Stewart & Co., 1894): 6–12, on pp. 8–9.

. . . I look upon the doctrine of future rewards and punishments as a motive to action to be radically bad, and as bad for savages as for civilized men. I look upon it, above all, as a bad preparation for a future state. I believe that the *only way* to teach and to civilize, whether children or savages, is through the influence of love and sympathy; and the great thing to teach them is to have the most absolute respect for the rights of others, and to accustom them to receive pleasure from the happiness of others . . . I cannot see that the teaching of all this can be furthered by the dogmas of any religion, and I do not believe that those dogmas really have any effect in advancing morality in one case out of a thousand.

166

. . . I have long since come to see that no one deserves either praise or blame for the *ideas* that come to him, but only for the *actions* resulting therefrom. Ideas and beliefs are certainly not voluntary acts. They come to us – we hardly know *how* or *whence*, and once they have got possession of us we cannot reject or change them at will. It is for the common good that the promulgation of ideas should be free – uninfluenced by either praise or blame, reward or punishment. But the *actions* which result from our ideas may properly be so treated, because it is only by patient thought and work, that new ideas, if good and true, become adopted and utilised; while, if untrue or if not adequately presented to the world, they are rejected or forgotten.

* * *

A few years back I wrote:

By 1862 and his return to England Wallace was a celebrity, and any concerns he may ever have ever felt over the validity of his personal philosophy of life had long since left him. Consider, therefore, the kind of effect spiritualist philosophy most likely would have had on him at that point. First, it concerned an occult subject – one, moreover, whose phenomena some were trying to attribute to a mechanism with which he was personally familiar: mesmerism. Each of these circumstances would have held interest for him. Not only could he personally contribute to the discussion as mesmerism pertained to it, but as a habitual champion of unappreciated causes, he would have enjoyed trying to right what he perceived to be naive criticisms of a poorly understood subject. Second, the moral teachings of spiritualism were directly relatable to phenomena that appeared to be, at least in some instances, verifiable, and were thus believable. Here, it seemed, was another aspect of the natural world inviting detached exploration by the intelligent skeptic, and Wallace was by nature both skeptical and insatiably curious. Third, the teachings themselves avoided dogma, instead encouraging the individual to respond as his or her personal assessment of the facts warranted. No unmeritorious belief here: this was not religion – at least not of any variety depending on the kind of inculcation and blind acceptance to which Wallace objected. The teachings were also perfectly in line with the ideas on continuity of causality Wallace had reasoned out and adopted some twenty or more years earlier. In short, he recognized in spiritualism elements of a truly “natural” philosophy: it gave a logical, testable accounting of how just cause and effect are related at the level of human consciousness, moral and intellectual behavior, and evolution. Spiritualism, moreover, endorsed his program of “balancing evidence” (as so succinctly described in the letter of 15 March 1861 to his brother-in-law); i.e., its proponents concurred with his earlier-expressed feeling that there was to be no fear of suffering “for the study of

¹⁶⁶ From a letter from Wallace to the biologist George Rolleston reproduced in *My Life* 1905, vol. 2: 52–54, on p. 54.

nature and the search for truth.”¹⁶⁷ His familiarization with spiritualism could only have fortified his already existing negative impression of conventional theism: the less one depended on opinions served up by unquestioning authority, the better. . . .

Analysis of Wallace’s intellectual development before – or after – 1858 should not rest on undefendable assumptions. It cannot be admitted as demonstrated (and in fact the issue is hardly ever even raised) that the teachings of spiritualism are fundamentally inconsistent with nature as the latter is more conventionally interpreted, and, more importantly, these teachings are, in point of fact, neither anti-evolutionary nor anti-“progressive.” In my opinion, Wallace viewed them as relaying an evolutionary interpretation of reality, and as being, to a close approximation, compatible with the then-developing materialistic interpretations of biological evolution. Of course, if it is argued *a priori* that spiritualism and evolution *must* represent mutually incompatible conceptual domains, one inexorably arrives at the facile conclusion that upon accepting spiritualistic beliefs Wallace must have had a change of mind regarding natural selection’s relation to man’s higher faculties. But the fundamental principles of Wallace’s approach to the study of man/nature had been set in his mind well before he finally stumbled onto natural selection, and given the fact that he repeatedly re-affirmed his belief in those principles in his writings over a span of seventy years – that is, over a period beginning well before 1858 – it is extremely difficult to believe that either natural selection or spiritualism had any profound effect on re-directing them. His relation of the two ideas is the product of his personal evolution of thought, not its cause.¹⁶⁸

¹⁶⁷ A completely different interpretation of Wallace’s conversion to spiritualism has been given by Ross Slotten in his biography of Wallace *The Heretic in Darwin’s Court* (Columbia University Press, 2004). Slotten suggests that the break-off of his marital engagement with Miss Leslie about October 1864 may have left Wallace so despondent that he was unable to continue his professional life for nearly two years (until early or mid-1866, when he re-married); *i.e.*, that he was in need of emotional support. Much evidence goes against this theory. First, his involvement in professional science was not much, if any, disturbed by the event. From October 1864 through May 1865 he attended and contributed to the six main scientific societies he kept up with at about the same rate he had since he returned from the East in 1862. Also, between October 1864 and June 1865 twelve of his writings/commentaries reached print – just about his career standard.

Second, the chronology Slotten poses does not make sense. If Wallace had been so stunned that he couldn’t work, why would it have taken a full nine months for his productivity to drop off (as it actually did after June 1865)? Further, in the biographies by Raby, Shermer, and even Slotten’s itself it is noted that Wallace began socializing with his eventual wife Annie in early 1865: surely this would have meant an upturn in his spirits at that point.

Third, neither I nor anyone I have asked on this point can recall ever seeing anything connecting Wallace with practicing spiritualism-focused religious groups. If he was indeed in need of emotional support, wouldn’t this have been the route? His main emotional connection to spiritualism seems to have been more related to the satisfaction it gave him insofar as his operating cosmology went, than to emotional healing or support.

Fourth, what kind of emotional comfort might Wallace have expected to receive *at that time* from spiritualism? Spiritualism cannot be said to be a tonic for affairs of the heart. Perhaps had he just lost someone close through death this argument might fit, but this was not the case.

Fifth, the kind of incidental involvement Slotten has proposed – a single and discrete emotional stress – does not explain why Wallace continued to take spiritualism so seriously right through to the end of his days. This is indicative of a strong intellectual commitment extending far beyond those immediate circumstances.

And last, Slotten’s theory does not explain the clear progression of ideas related to “informed belief” Wallace was developing at that time, as explained in the next chapter. Neither does it help us understand why the progressive development of this theme seems to end abruptly, at least for the time being, exactly in June 1865.

¹⁶⁸ Alfred Russel Wallace: *Evolution of an Evolutionist*, Chapter One.
<http://people.wku.edu/charles.smith/wallace/chsarw1.htm>

Wallace and Intelligent Design

For several years, proponents of the “Intelligent Design” theory have been trying to make Wallace into a poster-child for their movement. Some of their arguments are enticing, but in the end Wallace cannot be viewed as thinking in a way that fits into their agenda. There are two main reasons for this: (1) Wallace was never a believer in a universe operating continuously under first causes, and (2) in Wallace’s world – even the “spirit realm” espoused by spiritualists – all events are part of nature, and occur under the operation of natural law. Wallace’s world view is perhaps best classified as “scientistic,” or perhaps “hyper-naturalistic,” to the extent that he wished to attribute a naturalistic kind of organization to forces not yet recognized as falling within the conventionally understood limits of nature. To look at this in more detail, we must first consider some nomenclatural matters.

There are several terms especially relevant to understanding Wallace’s mature world view. These include “teleology,” “final causes,” “first causes,” and “theism.” Concerning “teleology,” *Webster’s*¹⁶⁹ provides several slants of meaning largely, but not quite, amounting to the same thing: “**1a**: the study of evidences of design in nature **b**: a doctrine (as vitalism) that ends are immanent in nature **c**: a doctrine explaining phenomena by final causes **2**: the fact or character attributed to nature or natural processes of being directed toward an end or shaped by a purpose **3**: the use of design or purpose as an explanation of natural phenomena.” The *Dictionary of Philosophy*¹⁷⁰ defines “teleology” more simply: “the study of phenomena exhibiting order, design, purposes, ends, goals, tendencies, aims, direction, and how they are achieved in the process of development.” It also gives a more detailed accounting under the entry “explanation, teleological”: “**1**. Explanation in terms of some purpose (end, goal) for which something is done. **2**. Explanation in terms of goal-directed or purpose-directed activity. Usually the goal or purpose is preset or planned. **3**. Explaining the present and past with reference to something in the future (a goal, purpose, end, result) that is being striven for or for the sake of which the process takes place. Opposite to mechanistic explanation, which explains the present, and any future event, in terms of conditions prior to it. **4**. Explanation in terms of the structures and activities of the parts of a whole being adapted (coordinated, adjusted, fitted suited) to each other toward the fulfillment of the purposes or needs of that whole.” Under “causes, Aristotle’s four” it defines “final cause” as “*that for the sake of which* an activity takes place; that end (purpose, goal, state of completion) *for which* the change is produced, or for which the change aims (strives, seeks). Its *telos* or *raison d’être*.” “First cause” is defined as “**1**. The uncaused being usually called God, which is the initial cause of the universe’s existence. Before this first causal event there was either (a) no universe in existence and God created the universe out of nothing, or (b) the universe existed statically without any causal series or interrelationships activating it. **2**. That uncaused being which is the continual causal ground for the particular cause-effect patterns that occur at any given time in the universe. This being may be as in **1**, or it may be the support at each moment of events that stretch back infinitely.”

¹⁶⁹ *Webster’s Seventh New Collegiate Dictionary*. G. & C. Merriam Company, 1967.

¹⁷⁰ Angeles, Peter A., *Dictionary of Philosophy*. Barnes & Noble Books, 1981.

This excursion into definitions has a point. The word “teleology” reduces to a statement about goal-orientation; “final causes,” on the other hand, is more concerned with the notion of ultimate limitations, whatever these may be. The more he aged, the more Wallace certainly did believe there was purpose to the universe, and that that purpose was centrally connected to the development of beings enlightened enough to perceive, respect, and add to its diversity. The thing that distinguishes Wallace from the typical teleologist is his insistence that all kinds of development rest on the execution of natural laws. Thus, whether an individualized God existed or not, any influence He had on the system came through causes that were passed down through the naturally-operating hierarchy. I suspect that Wallace believed there were overarching “rules of order” that promoted diversity in the universe – the kind of diversity that was both beautiful on its own account, and lesson-bearing. Some may regard this as an overly optimistic view of reality, but at the least there must be few more positive ways of approaching it than a belief that a full appreciation of its beauty is indistinguishable from what is fundamentally important.

The way Wallace’s understanding better fits into the model of “final causes” than it does “teleology” is perhaps best exemplified by the way he treated the phenomenon of miracles. In his essay “An Answer to the Arguments of Hume, Lecky, and Others, Against Miracles” he quite clearly expresses his objections to the ways other writers have dealt with these, then explains his take on the matter:

Before proceeding any further, it is necessary for us to consider what is the true definition of a miracle, or what is most commonly meant by that word. A miracle, as distinguished from a new and unheard-of natural phenomenon, supposes an intelligent superhuman agent either visible or invisible; – it is not necessary that what is done should be beyond the power of man to do. The simplest action, if performed independently of human or visible agency, such as a tea-cup lifted in the air at request, as by an invisible hand and without assignable cause, would be universally admitted to be a miracle, as much so as the lifting of a house into the air, the instantaneous healing of a wound, or the instantaneous production of an elaborate drawing. My definition of a miracle therefore is as follows: – “Any act or event implying the existence and agency of superhuman intelligences,” considering the human soul or spirit, if manifested out of the body, as one of these superhuman intelligences. This definition is more complete than that of Hume, and defines more accurately the essence of that which is commonly termed a miracle.¹⁷¹

However, since Wallace portrays such “superhuman intelligences” as being, in effect, under the rule of natural law, his portrayal of the term “miracle” reduces to the idea of an event caused by natural forces we do not yet understand. He treats the notion as being for all practical purposes a contradiction in terms, one which will cease to have meaning once all the mysteries of nature are understood.

There remains the term “theism.” *Webster’s* defines it as “belief in the existence of a god or gods; specifically belief in the existence of one God viewed as the creative source of man and the world who transcends yet is immanent in the world.” The *Dictionary of Philosophy* defines the term as “1. Belief in divine things, gods, or a God. 2. Belief in one God (monotheism) transcending but yet in some way immanent in the universe.

¹⁷¹ “An Answer to the Arguments of Hume, Lecky, and Others, Against Miracles.” *The Spiritualist* (London) 15 November 1870: 113–116, on p. 115.

Contrasted with deism. Other characteristics usually associated with this monotheistic Deity of theism: God is personal, the creator, the sustainer of existence, omnipotent, omnibenevolent, omniscient, supreme in power, reality, and value, the source and sanction of all values, and accessible to human communication.” In his own time Wallace may have been regarded as a theist because of his adoption of spiritualism, but in hindsight this seems an inappropriate label. Wallace and many other spiritualists treated the “realm of spirit” as a part of the natural world. He certainly did not espouse views directly relatable to the definitions just given; neither did he ever support conventional religious beliefs connected to them.

Nevertheless, Wallace was not so confident of his view of reality to think he understood the ultimate final cause, if indeed there was only one such thing. He on occasion refers, sometimes metaphorically, to the possible or likely existence of “higher” entities – angels, messengers, etc. – but envisions their role within a context of natural law, not divine intervention. Again, his view of God was not exactly that He did not exist, but that the conventional view of an omnipotent being was not quite viable. The way Wallace distanced himself from a conventional concept of God is also evidenced in the variety of terms he used to describe such a being or force. A quick examination shows him using, probably among others, the words: Great Mind, Supreme Intelligence, Supreme Being, Supreme Guiding Intelligence, Supreme Power, Supreme Creator, Organising Intelligence, Superior Intelligence, Creator, and Supreme Creator. Perhaps his most succinct statement on the matter came from a late interview:

I have always felt, like Herbert Spencer, that God is unknowable and unthinkable; but directly we get the idea of a life beyond ours we can conceive the scale of being rising higher and higher. Whether it culminates in one personality or goes on endlessly we cannot tell, and it does not matter. For thirty years before I became convinced of the truth of spiritualism I was an agnostic. My only religion is that which I get out of spiritualism. The world is the means of developing human souls, and our future depends upon our use of present opportunities. When we leave this world, having thrown aside the body, our development goes on from the exact point we have reached here.¹⁷²

A few years later he wrote “I still, and more than ever, feel that all attempts to state or define the nature, capacities, or possibilities of that power above us, which is the source of all power and all life, which we speak of as God or Deity, is beyond our conceptions, as is all that is infinite.”¹⁷³

The Final Cause

Wallace’s hyper-naturalism (or, if one wishes to be a bit more derogatory, scientism) leads to a view of world order which is in its own way as positivistic as that sponsored by conservative materialists. The main difference, of course, is that he accepts that non-spatially-extended beings (and other things?) exist, even if they are a bit hard to pin down for analysis. What are we to make of this? Is this just foolishness, or can we imagine a

¹⁷² “A Visit to Dr. Alfred Russel Wallace” (anonymous interview). *The Bookman* (London) January 1898: 121–124, on p. 122.

¹⁷³ “Mr. Blatchford’s Dogmatism.” *The Christian Commonwealth* 11 September 1912: 815.

model of nature that might actually lend itself both to a final causes philosophy, and a valid scientific understanding?

I don't see why not. While teleology usually is related to some manner of first causation, final causation merely suggests that there are structural limitations to the ways complex systems can develop – in sum, and perhaps even individually as well. That we may not perceive just yet what those limitations are, and how they operate, should not be considered evidence that they are not there. Certainly we have not made much of an attempt to identify controls of this kind, as we have spent the last three hundred years dwelling on the way simple systems operate, and confined most of our modeling to the way proximate causes operate.

That said, from time to time individuals have come up with models of nature that at least touch on the notion of final causation. This is not the place for what would be a long and difficult review (including figures in many different disciplines ranging from geography to engineering, and philosophy to natural history), but recent two examples, at least, can be mentioned. First, and more quickly, we might point to the work of Adrian Bejan, an engineer, who has produced a model of nature he calls “constructal theory.”¹⁷⁴ The essence of this is the notion that “for a finite-sized system to persist in time . . . it must evolve in such a way that it provides easier access to the imposed currents that flow through it.” Bejan projects this process as fundamental to the way all natural systems (including human social ones) self-organize; thus it can be considered a “final cause.” Bejan has provided many examples of systems that apparently have developed in such a fashion, and many means both of measuring their operation, and relating his new concepts to earlier understandings and terminology.

Bejan's theory has found some favor, but it has also been criticized for its lack of definitional clarity, including the notion of “imposed flows” and what encourages them to come into being, especially into different “designs.” He apparently views the constructal process as being an unending one, and not moving toward some particular end design.

While the author respects this exploration of the matter of design in nature, there yet seems to be something missing in it: a way of measuring the process that is more than just descriptive. In the 1980s I myself was investigating the question of self-organization when I came upon the writings of Benedict de Spinoza, the seventeenth century philosopher. Spinoza argued that natural existence manifests itself to human appreciation through two forms of expression he termed “attributes”: these were, spatial extension, and thought. These “attributes” could be viewed as inherent in all natural systems. I finally came to think of these as “rules” that might guide the way systems subsystemize; that is, that channel the way energy and/or materials flowed back and forth through them. After publishing a paper in 1986¹⁷⁵ on my interpretation of how one of the two Spinozian attributes might operate (creating a hierarchical pattern of subsystems organized on most-probable-state principles), I began to consider how the second, spatial extension, might

¹⁷⁴ Bejan, Adrian, *Advanced Engineering Thermodynamics* (Wiley, 2006); *idem*, “The Constructal Law of Design and Evolution in Nature” (*Philosophical Transactions of the Royal Society of London B* 365, 2010: 1335–1347); *idem*, *Design in Nature* (Doubleday, 2012).

¹⁷⁵ “A General Approach to the Study of Spatial Systems. I. The Relational Representation of Measurable Attributes.” *International Journal of General Systems* 12, 1986: 359–384. At first I thought this model might account for spatial structure, but I have since changed my mind and now believe it relates to Spinoza's “thought” (or perhaps best described as “history”) attribute.

be organized. To make a long story short, the model I came up with is one in which the flows of information/materials among each subsystem structure can be understood as projecting a kind of balance which, on a system to system basis (whether large or small), is spatial extension itself. Thus, “space” is understood to be an emergent property in each system, and not merely “something” that all systems “exist in.”

I have spent a fair amount of time over the years undertaking various simulations and pilot studies on real world structures, and so far found a good deal that supports the basic thesis.¹⁷⁶ Unfortunately, it has proved difficult to come up with data sets that ultimately would stand up to a formal publication process. Recently, however, such a data set finally emerged and a related paper has been published in a life sciences journal.¹⁷⁷

This excursion into post-Wallace thinking is meant to alert the reader that the thoughts of Wallace are not necessarily of historical interest only. We have already discussed another concept of Wallace’s, the “steam engine governor” metaphor of natural selection operation, which might lend itself to improved understandings within the biological and biogeographical realms, but this might not be the end of them. The model just discussed above, for example, has properties that extend beyond spatial extension-related outcomes. In it, a statistical operation known as entropy maximization is employed to identify, via simulation, what spatial structures could possibly exist (that is, as part of the spatially-extended “natural” world), and which cannot. And yet the latter, comprising the vast majority of the outcomes, cannot be ruled out as “not existing,” only as not existing as a physical reality. For those interested in the “paranormal,” and in Wallace’s ideas on spiritualism, this (or at the least, ideas like it) might represent a whole new avenue for exploration.

Chapter Six. Change of Mind / No Change of Mind?

One of the most discussed aspects of Wallace’s career has been his apparent change of mind regarding the universality of natural selection, especially as suggested by his 1869 review of the Charles Lyell volumes. Actually, there has been little discussion as to whether there was such a change of mind; the mere fact of his break has been taken as proof of such. Here I should like to challenge that assumption. Although I concede that Wallace changed his expressed opinion, I don’t believe that his was a *reversal* of position, but instead an *evolution* of it.

Now this may seem a fine point, but actually it is a very important one. How can one hope to understand Wallace’s world view if we don’t have a reasonable explanation for his behavior on this core issue? What was his train of thought between 1858 and 1869, and should we think that at *any time* he believed natural selection could be used to understand the higher human attributes? Before I try to make my argument, we should first ask what Wallace himself said on the matter.

This discussion would be severely compromised if Wallace had ever written something such as: “Before I was introduced to spiritualism in 1865 I believed natural selection accounted for all human attributes,” or “Around 1864 I decided natural selection was not

¹⁷⁶ I have created a website which outlines the progress of this model. It forms part of *The Once and Future Wallace* site, at: <http://people.wku.edu/charles.smith/once/writings.htm#2>

¹⁷⁷ “‘In Space’ or ‘As Space’?: A New Model.” *Life* (MDPI) 2, 2012, in press.

capable of helping us work out social issues,” or the like. But in fact no one has claimed he ever wrote anything like this.

He did however once write, specifically, that his break with Darwin was *not* due to his adoption of spiritualism. Here is a passage from the Preface to the first edition of *On Miracles and Modern Spiritualism* in 1875 that seems right to the point:

I am informed that, in an article entitled “Englische Kritiker und Anti-Kritiker des Darwinismus,” published in 1861 [*sic*, an error for 1871], he has put forth the opinion that Spiritualism and Natural Selection are incompatible, and that my divergence from the views of Mr. Darwin arises from my belief in Spiritualism. He also supposes that in accepting the spiritual doctrines I have been to some extent influenced by clerical and religious prejudices. As Mr. Dohrn’s views may be those of other scientific friends, I may perhaps be excused for entering into some personal details in reply.

From the age of fourteen I lived with an elder brother, of advanced liberal and philosophical opinions, and I soon lost (and have never since regained) all capacity of being affected in my judgments either by clerical influence or religious prejudice. Up to the time when I first became acquainted with the facts of Spiritualism, I was a confirmed philosophical sceptic, rejoicing in the works of Voltaire, Strauss, and Carl Vogt, and an ardent admirer (as I still am) of Herbert Spencer. I was so thorough and confirmed a materialist that I could not at that time find a place in my mind for the conception of spiritual existence, or for any other agencies in the universe than matter and force. Facts, however, are stubborn things. My curiosity was at first excited by some slight but inexplicable phenomena occurring in a friend’s family, and my desire for knowledge and love of truth forced me to continue the inquiry. The facts became more and more assured, more and more varied, more and more removed from anything that modern science taught or modern philosophy speculated on. The facts beat me. They compelled me to accept them as facts long before I could accept the spiritual explanation of them; there was at that time “no place in my fabric of thought into which it could be fitted.” By slow degrees a place was made; but it was made, not by any preconceived or theoretical opinions, but by the continuous action of fact after fact, which could not be got rid of in any other way. So much for Mr. Anton Dohrn’s theory of the causes which led me to accept Spiritualism. Let us now consider the statement as to its incompatibility with Natural Selection.

Having, as above indicated, been led, by a strict induction from facts, to a belief – 1stly, In the existence of a number of preterhuman intelligences of various grades and, 2ndly, That some of these intelligences, although usually invisible and intangible to us, can and do act on matter, and do influence our minds, – I am surely following a strictly logical and scientific course in seeing how far this doctrine will enable us to account for some of those residual phenomena which Natural Selection alone will not explain. In the 10th chapter of my *Contributions to the Theory of Natural Selection* I have pointed out what I consider to be some of those residual phenomena; and I have suggested that they may be due to the action of some of the various intelligences above referred to. This view was, however, put forward with hesitation, and I myself suggested difficulties in the way of its acceptance; but I maintained, and still maintain, that it is one which is logically tenable, and is in no way inconsistent with a thorough acceptance of the grand doctrine of Evolution, through Natural Selection, although implying (as indeed many of the chief supporters of that doctrine admit) that it is not the all-powerful, all-sufficient, and only cause of the development of organic forms.¹⁷⁸

¹⁷⁸ *Miracles and Modern Spiritualism* (Nichols & Co., 1901), pp. vi–viii.

Obviously, then, Wallace recognized no incompatibility between his belief in spiritualism and his support of natural selection. Nevertheless, many writers have concluded that spiritualism, or perhaps a growing perception that natural selection could not support his utopian social views, did in fact sway his judgment on the matter. Among the writers who have weighed in on this subject are Smith, Kottler, Schwartz, Oppenheim, Malinchak, and Benton.¹⁷⁹

Roger Smith's essay was important for its early recognition of the interdependent nature of Wallace's ideas. Smith writes: "A consideration of Wallace's philosophy of nature . . . leads to the conclusion that he saw and intended no discontinuity between general and human evolution and that it is a mistaken view to recognize such a discontinuity." He adds, however, ". . . it is not clear when or why he became involved with spiritualism" and "it remains an historical problem to determine how far the teleology of the later work was present in his thought during the earlier period." Smith's personal view of Wallace's rejection of natural selection's all-sufficiency is that it was incompatible with his utopian socialist perspective, especially as the principle of utility, one of natural selection's key concepts, could not explain the higher human faculties.

Malcolm Kottler comes to a more definite conclusion: that Wallace's spiritualism "deeply influenced his evolutionary thought"; that is, that "spiritualism stimulated Wallace to reconsider the utility of various human features" and thus became the cause of his break with Darwin on the question of humankind's higher evolution. Kottler also identifies two other lines of thought that conceivably could account for Wallace's break: (1) that he had "two independent grounds for his divergence – scientific and spiritual," and had "*originally* concluded that natural selection was inadequate in the origin of man on the basis of his utilitarian analysis of various human features" and (2) that "the source of Wallace's recognition of natural selection's inadequacy in the origin of man was his own conception of the nature of natural selection rather than his belief in spiritualism." But he then rejects these as explanations.

Joel Schwartz's essay gives attention to the spiritualism question as a side issue. He concludes that Wallace's views on man must have started to change before his commitment to spiritualism in 1865, stating: "Wallace's departure from the Darwinian point of view of the origin of man resulted from his inability to bridge his scientific and moral beliefs," and "Wallace's belief in social equality and political reform conflicted with the ineluctable operations of natural law (including natural selection)."

Janet Oppenheim focuses on what she sees as Wallace's inability to recognize a "dividing line between science and spiritualism," and his desire to "eliminate the aura of the supernatural that clung to spiritualist phenomena." But she is unable to decide "whether spiritualism alone can explain Wallace's rejection of natural selection as the sole

¹⁷⁹ Smith, Roger, "Alfred Russel Wallace: Philosophy of Nature and Man" (*British Journal for the History of Science* 6, 1972: 177–199); Kottler, Malcolm Jay, "Alfred Russel Wallace, the Origin of Man, and Spiritualism" (*Isis* 65, 1974: 144–192); Schwartz, Joel S., "Darwin, Wallace, and the *Descent of Man*" (*Journal of the History of Biology* 17, 1984: 271–289); Oppenheim, Janet, *The Other World; Spiritualism and Psychical Research in England, 1850–1914* (Cambridge University Press, 1985); Malinchak, Michele, 1987. *Spiritualism and the Philosophy of Alfred Russel Wallace* (Ph.D. Dissertation, Drew University, 1987); Benton, Ted, "Wallace's Dilemmas: the Laws of Nature and the Human Spirit" (in Charles H. Smith & George Beccaloni, eds., *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace*, Oxford University Press, 2008: 368–390).

agent of evolutionary change where the human race was concerned,” though “It does appear that Wallace’s doubts about natural selection first arose from evidence acquired at the séance table, not from biological or geological discoveries that forced him to reconsider his initial theory of evolution in respect of humanity.”

Michele Malinchak notes that “It was only after Wallace engaged in his extensive studies in spiritualism and became convinced of the genuineness of spiritualistic phenomena that he began to inject quasi-religious notions of the guidance of higher intelligences in the development of the human mind into his scientific arguments.” She prefers to regard Wallace’s adoption of spiritualism as caused by some aspect of his early experiences with the supernatural, and of period social and intellectual trends.

More recently Michael Benton has embraced the “change of mind” model, opining that perhaps “the 1864 paper did address the question of humans’ superior qualities, presenting an explanation of them in terms of the gradual emergence of a new target – brain and mind – for the action of natural selection. In the original paper Wallace would have felt no need to explain the advance of human mental development other than by way of random variation (which he always took to be universal in organic beings, and capable of being taken in any direction and accumulated by selective pressures).”

These representative opinions indicate a general sense that Wallace possibly was led to spiritualistic and/or utopian beliefs as a function of his eventual (and perhaps disillusioned) inability to conceive human evolution in materialistic terms – in particular, because of the limitations of natural selection. So too, spiritualism could have provided Wallace with a previously missing religious foundation for his life.

I don’t believe any of this, because (1) there is absolutely no evidence from Wallace himself that any such influences were involved, (2) there is nothing in his writings that has been used as evidence of such a turn of mind that cannot be interpreted differently (and better), (3) there is nothing in his evolutionary writings prior to 1864 that can be seen as supporting a view that humans were affected by the exact same influences plants and lower animals are, and (4) Wallace’s writings immediately prior to his investigation of spiritualism in 1865 suggest that he was on a different course than has been attributed to him.

I have just noted that Wallace himself denied any “change of mind” based on spiritualism. Yet many sources have pointed to two writings of his that might be taken (and *have been taken*) as suggesting an admonition of such. Malcolm Kottler, in his work mentioned above, states: “Wallace wrote to Darwin in 1869 that his new view was solely the result of his new belief in spiritualism,” a conclusion based on a letter dated April 18, 1869, that Wallace sent to Darwin. This was right at the time of Wallace’s Lyell book reviews. In it he says:

I can quite comprehend your feelings with regard to my “unscientific” opinions as to Man, because a few years back I should myself have looked at them as equally wild and uncalled for . . . My opinions on the subject have been modified solely by the consideration of a series of remarkable phenomena, physical and mental, which I have now had every opportunity of fully testing, and which demonstrate the existence of forces and influences not yet recognised by science.

Usually these words have been interpreted as evidence of a reversal of opinion on Wallace's part. But this is reading too much into them. Consider them for what they are. He says only that the now "fully tested" phenomena have led him in a direction which "a few years back" he would have considered "wild and uncalled for" (*i.e.*, in the absence of substantiating evidence). In presenting this as indicative of a reversal of position, Kottler *assumes* that prior to 1864 – particularly, since the 1858 Ternate essay – Wallace believed natural selection shaped mankind's evolution just as it did other living things. In this letter Wallace uses the term "modified" – rather than "reversed" or even "changed" – to describe the shift from his earlier position. This causes us to wonder whether, from 1858, there was any position to change *from*.

Another Wallace writing, this time one he actually published, has also frequently been cited as evidence supporting the "change of mind" interpretation. When Wallace included the 1864 paper "On the Origin of Human Races . . ." in his collection *Contributions to the Theory of Natural Selection* in 1870, he decided to make many alterations to it. Most were of stylistic nature or otherwise easy to account for, but some could be interpreted as position changes. For example, at the end of the 1864 version Wallace paints a highly utopian version for the future of the human race; this is deleted in the 1870 version and replaced with a much more reserved statement. Yet in speaking of the new version of "On the Origin of Human Races . . ." in the Preface to *Contributions* . . . he says: "I had intended to have considerably extended this essay, but on attempting it I found that I should probably weaken the effect without adding much to the argument. I have therefore preferred to leave it as it was first written, with the exception of a few ill-considered passages which never fully expressed my meaning." One can only interpret these words as signifying he considered the existing (1864) version sound, and was reluctant to modify it in any way that might take away from its argument. And once again, notice the wording: he uses the term "extended" – not "reversed" or "changed," and is apparently more worried about "weakening" the effect than not "adding" to it. If his opinion had "changed," why would he have: (1) decided to leave the essay more or less as it was; or (2) chosen to include it in *Contributions* . . . at all?

Nevertheless, there is still something to explain in this quotation: what Wallace's intended "meaning" was, and which were the parts of the original essay he thought "ill-conceived." I have a theory, and it does involve Wallace changing his mind, but not in way usually entertained.

Unlike most other observers (with the notable exception of Canadian Martin Fichman), I don't believe that Wallace *ever* thought that natural selection could account for the evolution of humankind's higher qualities. I believe this because, simply, there is no credible evidence that he did. In nothing he wrote between 1858 and 1864, including the Ternate essay itself, is there any mention of such a position, or in fact anything about the whole subject. Neither is there any mention in his writings over the next forty-nine years of taking such a position. The closest he comes to addressing the matter is to state the negative in a late interview: "My argument has always been that the mind and the spirit, while being influenced by the struggle for existence, have not originated through natural selection."¹⁸⁰

¹⁸⁰ Northrop, W. B., "Alfred Russel Wallace" (interview). *The Outlook* (New York) 22 November 1913: 618–622, on p. 621.

If this is so – that is, that Wallace had not committed himself to a model of the higher human attributes as of his Ternate paper – then what should one expect he was thinking about between 1858 and 1864? Well, of course, how to fit human beings into the equation. He had seen much in his travels to make him wonder why even human beings living in simple circumstances in the jungle had a capacity for creativity and learning that far exceeded their immediate needs. Thus, there seemed to be a fundamental problem with the principle of utility of adaptation in the case of humans. For the time being, however, he kept quiet on the matter – and besides, Darwin had said almost nothing on the subject either. It was easier to concentrate on defending ground already gained.

One of the first things Wallace did when he got back to London in 1862 was to read Herbert Spencer's newly published *First Principles*. Sometime later he and Bates arranged a meeting with Spencer at his home:

Bates and I, having both read "First Principles" and been immensely impressed by it, went together to call on Herbert Spencer, I think by appointment. Our thoughts were full of the great unsolved problem of the origin of life – a problem which Darwin's "Origin of Species" left in as much obscurity as ever – and we looked to Spencer as the one man living who could give us some clue to it. His wonderful exposition of the fundamental laws and conditions, actions and interactions of the material universe seemed to penetrate so deeply into that "nature of things" after which the early philosophers searched in vain and whose blind gropings are so finely expressed in the grand poem of Lucretius, that we both hoped he could throw some light on that great problem of problems.¹⁸¹

On two later occasions¹⁸² Wallace recalled how in middle life he had become consumed with the "individualist" thinking of Spencer, and I believe it was on this basis in 1864 that he made an attempt to extend the Darwinian line on natural selection as far as he felt he could to account for the manner of human evolution. On this matter I have written:

But this discussion pointedly avoided any explanation of the reasons behind the *emergence* of intellect or moral behavior. That their presence influenced man in ways that would be subjected to the influence of natural selection he did not doubt (nor did he in 1870, as expressed in the later version of the paper). Again, Wallace had for many years recognized that man exhibited many "above nature" qualities; "The Origin of Human Races . . ." was his attempt to describe how these qualities, *once in existence*, could be expected to aid or retard natural selection. The manner of their own origin and the connection of this to evolution in general, however, he still had no handle on and deliberately avoided. Wallace's basic model of the physical evolution of mankind – including the chronology of racial differentiation, the emergence of the higher characters, and the cessation of physical bodily change – remained largely unchanged between 1864 and 1870.¹⁸³

There is another interesting rewrite from the 1864 to 1870 versions of the essay on man. In 1864 Wallace wrote: "But while these [physical] changes had been going on, his

¹⁸¹ *My Life* 1905, vol. 2, p. 23.

¹⁸² Untitled letter to the Editor, *Labour Leader* 25 July 1896: 251; *My Life* 1905, vol. 1, p. 104.

¹⁸³ *Alfred Russel Wallace: Evolution of an Evolutionist*, Chapter Six.

<http://people.wku.edu/charles.smith/wallace/chsarw6.htm>

mental development had correspondingly advanced, and had now reached that condition in which it began powerfully to influence his whole existence, and would, therefore, become subject to the irresistible action of 'natural selection.'"¹⁸⁴ In the 1870 version this had been changed to: "But while these changes had been going on, his mental development had, from some unknown cause, greatly advanced, and had now reached that condition in which it began powerfully to influence his whole existence, and would therefore become subject to the irresistible action of 'natural selection.'"¹⁸⁵

The substitution of "from some unknown cause, greatly" for "correspondingly" indicates that by 1870 Wallace had settled on a model for the origin of humankind's higher faculties. In my "Evolution of an Evolutionist" I summarize Wallace's model as follows:

[In his view] The emergence of intellect and morality-based decision-making signaled the beginning of humankind's participation in the causal domain of a higher level of existence. This emergence was implicit in the evolutionary scheme, much as life had been when physical conditions had reached a satisfactory degree of complexity and stability. The immediate impact of intellect was to produce various kinds of "above nature" behavior, but eventually most such behaviors initiated negative feedback that would ultimately cause society to reject them (failure of entire societies being the consequence when rejection did not take place). Materialism was one such behavior. Though counterproductive as an all-consuming individual or societal goal, it had the vital effect of producing a gradual societal increase of knowledge, and through the latter a greater understanding of others leading to an elevation of tolerance and the moral sense. For example, in an 1894 review of Benjamin Kidd's *Social Evolution* Wallace speaks approvingly of Kidd's idea that religious belief produced an influence fundamental to the development of civilization through its support of centralization of power. This, despite the fact that at no point in his life did Wallace have more than nominal respect for the idea of religious belief as a goal of itself. Eventually, man's moral capacity would "catch up" with his intellectual excesses, at which point natural selection could again act in a fully positive fashion (rejecting, for example, those self-serving, "others-neglecting" materialistic tendencies that remained). This last concept was integrally connected to the "equality of opportunity" idea Wallace supported in such works as "Human Selection."¹⁸⁶ In a letter printed in *Nature* in 1903¹⁸⁷ Wallace dubbed this entirely "positive" form of selection, destined to "supersede" natural selection, "perpetuation of the fittest."

In Malcolm Kottler's 1974 essay a different conclusion is reached as to the changes Wallace made in his 1870 revision of the essay:

By 1870 Wallace was doubtful about natural selection's ability to produce such a future. The mediocre were, after all, the ones who reproduced most prolifically in civilized nations despite the fact that there was an indubitable advance, "on the whole a steady and a permanent one – both in the influence on public opinion of a high morality, and in general desire for intellectual evolution." Wallace was led to invoke an ". . . inherent progressive power of those glorious qualities which raise us so immeasurably above our fellow animals, and at the same time afford us the surest proof that there are other and higher existences than ourselves, from whom these qualities may have been derived, and towards whom we may be ever tending." The only other relevant change in the essay was Wallace's inclusion

¹⁸⁴ "The Origin of Human Races and the Antiquity of Man Deduced From the Theory of 'Natural Selection'." *Journal of the Anthropological Society of London* 2, 1864: clviii–clxxxvii, on p. clxvi.

¹⁸⁵ *Contributions to the Theory of Natural Selection* (Macmillan, 1870), pp. 320–321.

¹⁸⁶ "Human Selection." *Fortnightly Review* 48 n.s., 1890: 325–337.

¹⁸⁷ "Genius and the Struggle for Existence." *Nature* 29 January 1903: 296.

of the words “from some unknown cause” to explain the development of man’s mind from its near-animal condition to the point at which it began to shield man’s body from natural selection. Therefore this essay in its new form was contradictory. It still included passages describing natural selection’s accumulation of slight variations in man’s intellectual and moral nature leading to ever-higher human types. But in its final paragraph it referred to an inherent progressive power of development in man’s intellectual and moral nature handed down from on high. With such an inherent power, man’s intellectual and moral nature was independent of external conditions and the “chance” appearance of favorable variations. Therefore it was independent of and inexplicable by natural selection.¹⁸⁸

Two important errors invalidate this assessment. First, Kottler assumes that before both 1858 and 1864 Wallace’s conception of the evolution of humankind’s higher characters was not fundamentally different from his thinking on biological characters such as body weight or color of coat or skin. I have already suggested there is good reason to seriously question this assumption. In fact, the better evidence supports thinking that the 1864 to 1870 shift represented a return to his suspicions before the former date that there was something amiss; that is, that the 1858 essay was not up to explaining the higher human attributes.

Of equal importance, Kottler completely misreads Wallace’s (and spiritualists’ in general) understanding as to how the influences “from on high” are received by humankind. He seems to think these are to be understood as both interrupting the physical operation of natural selection, and superseding it in a deterministic manner – that is, as rendering inoperative an individual’s free will. There is no evidence that Wallace ever took such a position at any point in his career. Wallace apparently envisioned a biological natural selection process that operated by exploiting any individual advantages that passed into existence as a function of the forces underlying variation. As a spiritual process, the aid “from on high” could help humans become more aware of selfish, inconsiderate acts, and slowly change their behavior. Such “aid” would ultimately be selected for or against – as human decisions – in a manner not unlike the way physical adaptations came to be. Thus, although aid “from on high” could be described as a “progressive power,” this power was no surer in its unfolding than were any of the more rotely emerging adaptations accumulated through biological natural selection.

Wallace’s Adoption of Spiritualism: The Final Causes Model

If I am correct, Wallace’s temporary infatuation with Spencerian materialism ended shortly after his presentation of the 1864 paper on man. Sensing that this was not the correct approach, he began to consider what kinds of forces might stimulate the evolution of the higher human attributes. In some respects, this was a return to his early years before the discovery of natural selection, when he was trying to sort out what kind of an environmental framework might stimulate biological change. Perhaps some cultural or political environment was responsible; perhaps people’s minds and moral sensibilities were evolving in spite of themselves. What was the stimulus? How could one relate the notion of causal utility to an increase in conscious awareness?

¹⁸⁸ Kottler, Malcolm Jay, “Alfred Russel Wallace, the Origin of Man, and Spiritualism.” *Isis* 65, 1974: 144–192, on p. 154.

Wallace's thought process at this time is revealed in an almost unnoticed series of remarkable writings he put out from late 1864 to mid-1865. After fully digesting these, one can better understand why he took to spiritualism.

The first of these works was "On the Progress of Civilization in Northern Celebes," presented at the annual British Association for the Advancement of Science meetings in September 1864. In this paper Wallace focuses on what he terms "true savage life," and how in Celebes this had been modified by the form of coffee plantation culture introduced by the Dutch. This leads to an exploratory consideration of despotism, and how constructive forms of such might lead to social advance:

. . . there is in many respects an identity of relation between master and pupil, or parent and child, on the one hand, and an uncivilised race and its civilised rulers on the other. We know, or think we know, that the education and industry, and the common usages of civilised man, are superior to those of savage life; and, as he becomes acquainted with them, the savage himself admits this. He admires the superior acquirements of the civilised man, and it is with pride that he will adopt such usages as do not interfere too much with his sloth, his passions, or his prejudices. But as the wilful child or the idle schoolboy, who was never taught obedience and never made to do anything which of his own free will he was not inclined to do, would in most cases obtain neither education nor manners; so it is much more unlikely that the savage, with all the confirmed habits of manhood, and the traditional prejudices of race, should ever do more than copy a few of the least beneficial customs of civilisation, without some stronger stimulus than mere example.

It seems to me that Wallace is thinking out loud here, contemplating what types of forces might be needed to raise people's consciousness levels – that is, that might stimulate a more "informed" kind of belief. But, he concludes, despotism alone will not quite do it, "without some stronger stimulus than mere example." This interpretation of his words is not a stretch because, as we have seen, the connections between informed belief and justice represent a recurring theme in his writings throughout his career.

As the year 1865 began, Wallace was still struggling to work out a model accounting for the evolutionary function of ostensibly survival-unrelated characters. Some of the ideas present in "On the Progress of Civilization in Northern Celebes" are further developed a few months later in another revealing writing, "Public Responsibility and the Ballot." This brilliant essay-like letter to the editor¹⁸⁹ responded to remarks the renowned English philosopher and economist John Stuart Mill had made previously. As this work is critical to understanding Wallace's evolution of thought at this point, it is printed below nearly *in toto*.

. . . Mr. Mill truly says, that a voter is rarely influenced by "the fraction of a fraction of an interest, which he as an individual may have, in what is beneficial to the public," but that his motive, if uninfluenced by direct bribery or threats, is simply "to do right," to vote for the man whose opinions he thinks most true, and whose talents seem to him best adapted to benefit the country. The fair inference from this seems to be, that if you keep away from a man the influences of bribery and intimidation, there is no motive left but to do what he thinks will serve the public interest – in other words, "the desire to do right." Instead of drawing this inference, however, it is concluded that, as the "honest vote" is influenced by "social duty," the motive for voting honestly cannot be so strong "when done in secret, and when the voter can neither be admired for disinterested, nor blamed for selfish conduct."

¹⁸⁹ Reader 6 May 1865: 517.

But Mr. Mill has not told us what motive there can possibly be to make the man, voting in secret, vote against his own conviction of what is right. Are the plaudits of a circle of admiring friends necessary to induce a man to vote for the candidate he honestly thinks the best; and is the fear of their blame the only influence that will keep him from "mean and selfish conduct," when no possible motive for such conduct exists, and when we know that, in thousands of cases, such blame does not keep him from what is much worse than "mean and selfish conduct," taking a direct bribe?

Perhaps, however, Mr. Mill means (though he nowhere says so) that "class interest" would be stronger than public interest – that the voter's share of interest in legislation that would benefit his class or profession, would overbalance his share of interest in the welfare of the whole community. But if this be so, we may assert, first, that the social influence of those around him will, in nine cases out of ten, go to increase and strengthen the ascendancy of "class interests," and that it is much more likely that a man should be thus induced to vote for class interests as against public interests, than the reverse. In the second place, we maintain that any temporary influence whatever, which would induce a man to vote differently from what he would have done by his own unbiassed judgment, is bad – that a man has a perfect right to uphold the interests of his class, and that it is, on the whole, better for the community that he should do so. For, if the voter is sufficiently instructed, honest, and far-seeing, he will be convinced that nothing that is disadvantageous to the community as a whole can be really and permanently beneficial to his class or party; while, if he is less advanced in social and political knowledge, he will solve the problem the other way, and be fully satisfied that in advancing the interests of his class he is also benefiting the community at large. In neither case, is it at all likely, or indeed desirable, that the temporary and personal influence of others' opinions at the time of an election, should cause him to vote contrary to the convictions he has deliberately arrived at, under the continued action of those same influences, and which convictions are the full expression of his political knowledge and honesty at the time?

It seems to me, therefore, that if you can arrange matters so that every voter may be enabled to give his vote uninfluenced by immediate fear of injury or hope of gain (by intimidation or bribery), the only motives left to influence him are his convictions as to the effects of certain measures, or a certain policy, on himself as an individual, on his class, or on the whole community. The combined effect of these convictions on his mind will inevitably go to form his idea of "what is right" politically, that idea which, we quite agree with Mr. Mill, will in most cases influence his vote, rather than any one of the more or less remote personal interests which have been the foundation of that idea. From this point of view, I should be inclined to maintain that the right of voting is a "personal right" rather than a "public duty," and that a man is in no sense "responsible" for the proper exercise of it to the public, any more than he is responsible for the convictions that lead him to vote as he does. It seems almost absurd to say that each man is responsible to every or to any other man for the free exercise of his infinitesimal share in the government of the country, because, in that case, each man in turn would act upon others exactly as he is acted upon by them, and thus the final result must be the same as if each had voted entirely uninfluenced by others. What, therefore, is the use of such mutual influence and responsibility? *You cannot by such means increase the average intelligence or morality of the country; and it must be remembered, that the character and opinions, which really determine each man's vote, have already been modified or even formed by the long-continued action of those very social influences which it is said are essential to the right performance of each separate act of voting.* [my italics] It appears to me that such influences, if they really produce any fresh effect, are a moral intimidation of the worst kind, and are an additional argument in favour of, rather than against, the ballot.

Two other questions remain. Is the ballot necessary to prevent bribery and intimidation? Is it so injurious to independence of character as to overbalance its undoubted utility? I think Mr. Berkeley's letter in the *Times* in reply to Mr. Mill, and the experience of every general election, are sufficient to answer the first question in the affirmative. The answer to the second entirely depends upon the state of civilization and independence to which we have arrived; and it seems to me that in the days of standing armies, of an elaborate Poor Law, of State interference in education, of the overwhelming influence of wealth and the Priesthood, we have *not* arrived at that stage of general advancement and independence of thought and action in which we ought to give up so great and immediate a benefit to thousands as real freedom of voting, for the infinitesimal advantage to the national character which might be derived from the independent and open voting of the few who would feel it compatible with their duty to their families to struggle against unfair influence and unjust intimidation.

Wallace's argument here is a clear extension of his criticism of despotism: the only way to materially change for the better the results of a vote is first to develop a voter who "is sufficiently instructed, honest, and far-seeing, [that] he will be convinced that nothing that is disadvantageous to the community as a whole can be really and permanently beneficial to his class or party." We see here Wallace contemplating, centrally, what it will take to "raise the average intelligence or morality" of people. Wallace was beginning to get to the key point: because there was no merit to uninformed belief, people had to *believe* – that is, have individual *conviction* – that, as he later put it, "the thoughts we think and the deeds we do here will certainly affect our condition and the very form and organic expression of our personality hereafter." This is, at its most fundamental level, a "carrot argument," rather than a "stick" one.

Ten days after this last work appeared in print in *Reader*, Wallace was present at a meeting of the Anthropological Society of London and listened to the presentation of a paper entitled "On the Efforts of Missionaries among Savages." He offered a few comments on it at the meeting, but took up the subject in earnest in another essay, also published in *Reader*, entitled "How to Civilize Savages."¹⁹⁰ The entire text of this critical work follows:

Do our missionaries really produce on savages an effect proportionate to the time, money, and energy expended? Are the dogmas of our Church adapted to people in every degree of barbarism, and in all stages of mental development? Does the fact of a particular form of religion taking root, and maintaining itself among a people, depend in any way upon race – upon those deep-seated mental and moral peculiarities which distinguish the European or Aryan races from the negro or the Australian savage? Can the savage be mentally, morally, and physically improved, without the inculcation of the tenets of a dogmatic theology? These are a few of the interesting questions that were discussed, however imperfectly, at the last meeting of the Anthropological Society, when the Bishop of Natal read his paper, "On the Efforts of Missionaries among Savages;" and on some of these questions we propose to make a few observations.

If the history of mankind teaches us one thing more clearly than another, it is this – that true civilization and a true religion are alike the slow growth of ages, and both are inextricably connected with the struggles and development of the human mind. They have ever in their infancy been watered with tears and blood – they have had to suffer the rude

¹⁹⁰ *Reader* 17 June 1865: 671–672.

prunings of wars and persecutions – they have withstood the wintry blasts of anarchy, of despotism, and of neglect – they have been able to survive all the vicissitudes of human affairs, and have proved their suitability to their age and country by successfully resisting every attack, and by flourishing under the most unfavourable conditions.

A form of religion which is to maintain itself and to be useful to a people, must be especially adapted to their mental constitution, and must respond in an intelligible manner to the better sentiments and the higher capacities of their nature. It would, therefore, almost appear self-evident that those special forms of faith and doctrine which have been slowly elaborated by eighteen centuries of struggle and of mental growth, and by the action and reaction of the varied nationalities of Europe on each other, cannot be exactly adapted to the wants and capacities of every savage race alike. Our form of Christianity, wherever it has maintained itself, has done so by being in harmony with the spirit of the age, and by its adaptability to the mental and moral wants of the people among whom it has taken root. As Macaulay justly observed in the first chapter of his history: “It is a most significant circumstance that no large society of which the tongue is not Teutonic has ever turned Protestant, and that, wherever a language derived from that of ancient Rome is spoken, the religion of modern Rome to this day prevails.”

In the early Christian Church, the many uncanonical gospels that were written, and the countless heresies that arose, were but the necessary results of the process of adaptation of the Christian religion to the wants and capacities of many and various peoples. This was an essential feature in the growth of Christianity. This shows that it took root in the hearts and feelings of men, and became a part of their very nature. Thenceforth it grew with their growth, and became the expression of their deepest feelings and of their highest aspirations; and required no external aid from a superior race to keep it from dying out. It was remarked by one of the speakers at the Anthropological Society’s meeting, that the absence of this modifying and assimilating power among modern converts – of this absorption of the new religion into their own nature – of this colouring given by the national mind – is a bad sign for the ultimate success of our form of Christianity among savages. When once a mission has been established, a fair number of converts made, and the first generation of children educated, the missionary’s work should properly have ceased. A native church, with native teachers, should by that time have been established, and should be left to work out its own national form of Christianity. In many places we have now had missions for more than the period of one generation. Have any self-supporting, free, and national Christian churches arisen among savages? If not – if the new religion can only be kept alive by fresh relays of priests sent from a far distant land – priests educated and paid by foreigners, and who are, and ever must be, widely separated from their flocks in mind and character – is it not the strongest proof of the failure of the missionary scheme? Are these new Christians to be for ever kept in tutelage, and to be for ever taught the peculiar doctrines which have, perhaps, just become fashionable among us? Are they never to become men, and to form their own opinions, and develop their own minds, under national and local influences? If, as we hold, Christianity is good for all races and for all nations alike, it is thus alone that its goodness can be tested; and they who fear the results of such a test can have but small confidence in the doctrines they preach.

But we are told to look at the results of missions. We are told that the converted savages are wiser, better, and happier than they were before – that they have improved in morality and advanced in civilization – and that such results can only be shown where missionaries have been at work. No doubt, a great deal of this is true; but certain laymen and philosophers believe that a considerable portion of this effect is due to the example and precept of civilized and educated men – the example of decency, cleanliness, and comfort set by them – their teaching of the arts and customs of civilization, and the natural

influence of superiority of race. And it may fairly be doubted whether some of these advantages might not be given to savages without the accompanying inculcation of particular religious tenets. True, the experiment has not been fairly tried, and the missionaries have almost all the facts to appeal to on their own side; for it is undoubtedly the case that the wide sympathy and self-denying charity which gives up so much to benefit the savage, is almost always accompanied and often strengthened by strong religious convictions. Yet there are not wanting facts to show that something may be done without the influence of religion. It cannot be doubted, for example, that the Roman occupation laid the foundation of civilization in Britain, and produced a considerable amelioration in the condition and habits of the people, which was not in any way due to religious teaching. The Turkish and Egyptian Governments have been, in modern times, much improved, and the condition of their people ameliorated, by the influence of Western civilization, unaccompanied by any change in the national religion. In Java, where the natives are Mohammedans, and scarcely a Christian convert exists, the good order established by the Dutch Government and their pure administration of justice, together with the example of civilized Europeans widely scattered over the country, have greatly improved the physical and moral condition of the people. In all these cases, however, the personal influence of kindly, moral, and intelligent men, devoted wholly to the work of civilization, has been wanting; and this form of influence in the case of missionaries is very great. A missionary who is really earnest, and has the art (and the heart) to gain the affections of his flock, may do much in eradicating barbarous customs, and in raising the standard of morality and happiness. But he may do all this quite independently of any form of sectarian theological teaching, and it is a mistake too often made to impute all to the particular doctrines inculcated, and little or nothing to the other influences we have mentioned. We believe that the purest morality, the most perfect justice, the highest civilization, and the qualities that tend to render men good, and wise, and happy, may be inculcated quite independently of fixed forms or dogmas, and perhaps even better for the want of them. The savage may be certainly made amenable to the influence of the affections, and will probably submit the more readily to the teaching of one who does not, at the very outset, attack his rude superstitions. These will assuredly die out of themselves, when knowledge and morality and civilization have gained some influence over him; and he will then be in a condition to receive and assimilate whatever there is of goodness and truth in the religion of his teacher.

Unfortunately, the practices of European settlers are too often so diametrically opposed to the precepts of Christianity, and so deficient in humanity, justice, and charity, that the poor savage must be sorely puzzled to understand why this new faith, which is to do him so much good, should have had so little effect on his teacher's own countrymen. The white men in our colonies are too frequently the true savages, and require to be taught and Christianized quite as much as the natives. We have heard, on good authority, that in Australia a man has been known to prove the goodness of a rifle he wanted to sell, by shooting a child from the back of a native woman who was passing at some distance; while another, when the policy of shooting all natives who came near a station was discussed, advocated his own plan of putting poisoned food in their way, as much less troublesome and more effectual. Incredible though such things seem, we can believe that they not unfrequently occur whenever the European comes in contact with the savage man, for human nature changes little with times and places; and I have myself heard a Brazilian friar boast, with much complacency, of having saved the Government the expense of a war with a hostile tribe of Indians, by the simple expedient of placing in their way clothing infected with the smallpox, which disease soon nearly exterminated them. Facts, perhaps less horrible, but equally indicative of lawlessness and inhumanity, may be heard of in all our colonies; and recent events in Japan and in New Zealand show a determination to pursue our own ends, with very little regard for the rights, or desire for the improvement, of

the natives. The savage may well wonder at our inconsistency in pressing upon him a religion which has so signally failed to improve our own moral character, as he too acutely feels in the treatment he receives from Christians. It seems desirable, therefore, that our Missionary Societies should endeavour to exhibit to their proposed converts some more favorable specimens of the effect of their teaching. It might be well to devote a portion of the funds of such societies to the establishment of model communities, adapted to show the benefits of the civilization we wish to introduce, and to serve as a visible illustration of the effects of Christianity on its professors. The general practice of Christian virtues by the Europeans around them would, we feel assured, be a most powerful instrument for the general improvement of savage races, and is, perhaps, the only mode of teaching that would produce a real and lasting effect.

In this stunning analysis Wallace has advanced to the point of considering *exactly* what it might take – what kinds of “model institutions” – to deliver forms of instruction serving what could be termed “believable example”; that is, that will provide a foundation for informed belief. Clearly, inculcation was not enough; further, and building on the thoughts presented in the “Public Responsibility and the Ballot” letter earlier, neither were the opinions of the masses, which could not be depended on to “increase the average intelligence or morality of the country.” It was just at this point – probably sometime in June 1865, give or take a few weeks – that Wallace may have had a second revelation regarding the way evolution worked. I have summarized the nature of this vision elsewhere:

Although natural selection had for eons been able to accumulate biological variations through its trial and error enactment process, beyond a certain point this process was not further refinable: that is, it was inherently incapable of reacting constructively to the opportunities for “progress” afforded by the most subtle elements of the natural order. Human beings, possessing the qualities of higher intelligence and moral compass, could bring these to bear in an effort to identify these “most subtle elements” – which latter indeed turned out to be, in good part, those qualities themselves. As part of his debt to Spencer’s teachings, Wallace had held for many years that people were due no more nor less than what was implicit as the consequence of their actions: this, nothing more nor less than simple justice. While ignorant beliefs often resulted in actions that were counterproductive, one could apply oneself (in a near Spinozian manner) to a program of self-instruction designed to broaden one’s mind and ultimately produce fewer inappropriate actions. Thus, “intelligent conviction,” as he termed it in the Sims letter . . . could be progress-serving. The problem was to find some body of teachings that at one time promoted (1) intelligent examination of the facts *and* (2) a sense that one’s current actions determined, or at least strongly affected, the quality of later experiences (thus providing incentive for commitment). [It would turn out that] Spiritualism, which claimed that there was a natural afterlife in which the implications of one’s biological life experience were simply further lived out, fit this bill perfectly. Further, the “Spirit Realm” was itself alleged to have causal properties: various subtle avenues of communication (e.g., dreams) between the living and “spirits” supposedly existed, in theory contributing to the learning experiences of those still in the living, breathing, state. This was not religious inculcation of the type Wallace objected to; instead its supporters encouraged the interested to investigate and draw their own conclusions. Wallace’s own investigation of spiritualism – involving both digesting its literature and examining its manifestations at seances – would soon lead him to believe that spiritualism was genuine in the way it portrayed itself as being.¹⁹¹

¹⁹¹ Alfred Russel Wallace: *Evolution of an Evolutionist*, Chapter Five.
<http://people.wku.edu/charles.smith/wallace/chsarw5.htm>

It will be recalled that it was right at the point of the publication of “How to Civilize Savages,” in late June 1865, that Wallace’s sister Fanny convinced him to look into spiritualism. Fanny’s influence on her brother over the years was probably greater than has usually been acknowledged – it is clear he both loved her dearly and had a strong respect for her – and perhaps despite a slight initial reluctance, he followed her advice. It turned out that followers of spiritualism were typically not very aggressive about their belief: they merely invited the curious to take a look and decide for themselves. This seemed reasonable enough, so he began to do so. As discussed earlier, he followed a logical path, in three steps. He would first read up on the subject, at the same time undertaking “field studies” of the “manifestations” associated with seances. If convinced that both the philosophical arguments *and* the physical evidence held water, he would report his findings and suggest that spiritualism be subjected to formal study. But he would not wholeheartedly adopt the belief before he had witnessed séance phenomena that were under his control; that is, that convincingly resisted accusations of fraud.

Let us try to summarize this complicated business. Before 1858 Wallace had steadfastly rejected the notion of necessary utility; he viewed the emergence of adaptations as somehow being correlated with evolutionary change, but not more. With the Ternate essay he realized a more dynamic relationship between adaptation the physical character and adaptation the process, one which required an acceptance of the necessary utility concept. The key was accepting that adaptive change proceeded along non-preordained lines; that is, as a probabilistic interplay of (genetic) variation and environmental opportunity. This model seemed to work fine for plants, the lower animals, and pre-civilized hominids, but not for modern humans, with abilities and potentials exceeding mere survival value. What was the evolutionary utility of the latter? For several years he was unable to make much progress on this question, then, buoyed by Spencer’s writings and the general success of materialist Darwinism, he constructed the argument on the evolution of human races described in the 1864 Anthropological Society paper. But this essay only addressed the question of how adaptive characters, *once in place*, might further be modified, and not the matter of origins; otherwise put, it dealt with efficient causes, but not final causes. Spiritualism provided that final cause because through it one could understand the utility of advanced potentials.

So, when Wallace told Darwin in his 18 April 1869 letter that he had undergone a “modification” of position – rather than a “change” of position – he was simply stating the situation as it was. He had been unable to connect the origin of humankind’s intellectual and moral capacities to a general evolutionary position since taking up the question in the 1840s, and the ideas expressed in 1855’s “On the Law . . .”, 1858’s “On the Tendency . . .”, and 1864’s “The Origin of Human Races . . .” had not solved – or even addressed – this problem. The 1864 version of the essay on man was “ill-conceived” in that it still did not address the problem of hierarchical causation; *i.e.*, like “On the Law . . .”, it described results whose efficient causes could be directly inferred, but whose final causes could not.

To my mind, the “change of mind” hypothesis represents a mis-reading of the available facts.

Chapter Seven. Wallace and Social Responsibility

Despite Wallace's many forays into natural science, and the many successes he had in this direction, it is yet true that the world of human beings remained central to him throughout his lifetime. In his own time, and even to some degree at present, he has frequently been described as Wallace the "sociologist," "humanitarian," "anthropologist," "geographer," "socialist," etc. This side of his world view is less known to students of today, but he took a very strong interest in social evolution, and its many components. Earlier, we looked at some of the early influences on his evolution of thought, and many of these involved individuals and subjects not normally associated with biology or evolution. In comparison with his studies on evolution or biogeography, this element of his life's work has only been lightly examined; it thus seems most appropriate here to do a brief survey of it.

Wallace's work in the social realm did extend to theory and model-building, but as he was not an academically-trained observer he more often tried to think things out from first principles. And, although many of his ideas were new and interesting, he seemed to prefer to suggest solutions to social problems that were more idealistic than they were practical. In such work he relied heavily on basic principles set out by thinkers he particularly admired, for example Robert Owen, John Stuart Mill, and Herbert Spencer.

One of the more startling positions that Wallace held concerned wills and trusts. Fairly simply stated, he did not believe they should be allowed to exist – at least, after a person's death. The idea, basically, was that any funds or possessions owned by individuals should be delegated during their lifetimes. In one of his early social criticism essays entitled "Limitation of State Functions in the Administration of Justice," he concludes with the following words:

If the main principle here advocated – namely, that it is intrinsically absurd and morally wrong that a dead man's will or intention should have power to determine the mode of application of property no longer his – be a sound one, it will have a most important bearing on a question that is now much discussed, as to how far endowments of the National Church by private individuals may be properly claimed by the State. Even writers of very liberal views see in this a stumbling-block to the complete disendowment of the Church of England, because they cannot get rid of the notion that it is something like a robbery to take property given for one purpose and apply it to any other purpose. It is, therefore, a maxim with them, that when any change in the application of such a fund is demanded by public policy, it should still be kept as near as possible to the intentions of the original donor. It is, however, to be remarked, that when the property in question has already been forcibly applied to other uses than those originally intended, the most scrupulous do not propose that it should be brought back to its ancient use; and this seems to imply a doubt of the soundness of their principle. A large part of the existing endowments of the Church of England, for example, were certainly intended to maintain the teaching and services of the Roman Catholic religion. If the donor's intentions are "sacred," these should be given back to the Roman Catholic Church. If it be said that the intention was to maintain the religion of the country, whatever that might be, then the revenues should be fairly divided among all existing sects for the time being, – but that is "concurrent endowment," and is almost universally repudiated. The only consistent, and it is maintained the only true, view, is, that dead men should have no influence (beyond their personal influence on their friends) other than what is due to the intrinsic value of their opinions; and that property cannot be left in trust to carry out dead men's wishes, on the common-sense ground, that the living know better what is good for themselves than the dead can do, and that the latter have no just

or reasonable claim to coerce a society to which they no longer belong. To hold the contrary view is, practically, to allow men to continue to be the possessors of property after they are dead, and to give more weight to the injunctions of those who had no possible means of knowing what is best for us now, than we give to the deliberate convictions of men who still live among us and who have made our welfare their life-long study. The dead are not truly honoured by sacrificing the interests of the living to their old-world schemes; and if, as we may reasonably suppose, the future state is one of progress, at least as rapid as that which obtains on earth, it may be that they are afflicted with unavailing regrets at our blindness, in insisting on being guided by the feeble and uncertain light which they once had the presumption to imagine would for ever be sufficient to illuminate the world.¹⁹²

Thoughts such as these on inherited wealth probably generated a lot of head-scratching in their day, but of course had little practical effect. They conflicted, and still conflict, with strong emotional attachments: not only to questions of free will (“I’ll do what I damn well please with *my* money!...”), but also to feelings of responsibility to family and friends. Nevertheless, it is an interesting, if strangely dispassionate, point of view.

Wallace was also interested in institutional change. Although he never stood for public office he took part in a number of social movements, and published dozens of essays and letters to the editor suggesting specific kinds of reforms. For example, he wrote twice on reform in the House of Lords. In his first writing on this subject in 1894, he indicated his reasons for his suggestions, and described the kinds of persons who should be elected to this body. He then summarized:

The House of Lords, as it now exists in this last decade of the nineteenth century, is not only an anomaly but an utterly indefensible anomaly, and one wholly opposed to the spirit of the age. In the proposal now submitted to public consideration, a means is indicated of bringing it into harmony with modern ideas while preserving its historical continuity and constituting it so that it may be an aid, instead of a clog, to the wheels of progress. Will the Lords recognise the critical nature of their position, accept reform as inevitable and as the only alternative to destruction, and themselves initiate that reform? If they do so, in no hesitating or niggardly spirit, but fully recognising that a body claiming power to legislate for Englishmen *must* be representative, and *must* be elected either directly or indirectly by the people, then it is probable that even the ever-growing Radical party would willingly accept such a reform. They would be wise to do so; because they would thus obtain a legislative chamber probably as good as any that could be obtained after a lengthy and profitless struggle; and, further, because a chamber such as is here suggested is of a nature to admit of continual improvement, and would necessarily develop as the nation developed, always keeping, as it should do, in the van of advancing civilisation. When titles are given only for life, and are bestowed exclusively as recognitions of merit or of exceptional ability and integrity, there will grow up among us a true aristocracy characterised by the highest intellectual and moral qualities, while the old aristocracy of birth will be less and less esteemed, except in so far as it possesses similar characteristics. Educated public opinion will, from time to time, indicate the men who should be made eligible for election to the Upper Chamber, and no Ministry will then dare to advise the Sovereign to bestow this honour on the unworthy, or as a reward for mere political support, thus lowering the standard of those who are eligible for election by the peoples’ local representatives. If, further, it was the rule that each of the great political parties should

¹⁹² “Limitation of State Functions in the Administration of Justice.” *Contemporary Review* December 1873: 43–52, on pp. 51–52.

give titular honours to not more than a fixed number in each year, the balance would be kept even, and at successive elections each party would have an equal range of choice.¹⁹³

Thirteen years later he extended his discussion, suggesting his

QUALIFICATION FOR ELECTION TO THE NEW HOUSE OF LORDS.

1. Peers of the United Kingdom, Baronets, and Knights.
2. Ex-members of the House of Commons.
3. Members of the Privy Council.
4. Justices of the Peace.
5. Ex-Governors of a Colony or Dependency.
6. Ex-members of a Colonial Legislature.
7. Ex-members of the Diplomatic Services, Consuls-General, &c.
8. Ex-mayors of Boroughs.
9. Ex-chairmen of County or District Councils.
10. Fellows of the Royal Society.
11. Presidents of Chartered, Literary, or Scientific Societies.
12. Great writers, who offer themselves as candidates?

He then summarized:

Under the title 'A Representative House of Lords,' I stated my views on this question twelve years ago in *The Contemporary Review*. I have here expanded and modified them so as to bring them into harmony with the more advanced opinions that now prevail, and I submit my matured scheme to the Liberal majority in the present Parliament, as affording, I hope, some small assistance towards the great work of establishing a Constitutional and really worthy Upper House of Parliament – one which will give to our amended Constitution the highest place among the Governments of the world.¹⁹⁴

Needless to say, his advice was again disregarded.

In the same spirit, he suggested a strategy for reforming the Church of England. His first effort came in the form of an essay published in 1873, but in 1885 he sent a follow-up as a letter to the Editor of *The Daily News*. In it he wrote:

Let the Church, as a religious sectarian body, be completely disestablished and disendowed, but let the whole of the revenues and buildings now belonging to it as the Church of the nation be placed under the control of a body of specially educated men, who shall hold them in trust and administer them for good of the entire population. These officers – who might properly retain the time-honoured name of rectors – should be rigorously selected for their high moral character, energy, temper, and intellect. They should be thoroughly trained in a good elementary knowledge of medicine, sanitation, law, and natural science, and should rank socially with the higher members of the liberal professions. Their duties would comprise much of the parish work of the existing clergy, but being unsectarian and secular it would be co-extensive with the population. Being specially educated, they would be able to give simple medical assistance to the poor in cases of pressing necessity, to assist them in misfortune, to protect them from oppression, and to aid them in securing their legal rights; and they would thus establish their position as true friends, both able and willing to help all in trouble with comfort, advice, and assistance. Another important function of the rector would be to guard and preserve the

¹⁹³ "How to Preserve the House of Lords." *Contemporary Review* January 1894: 114–122, on pp. 120–121.

¹⁹⁴ "A New House of Lords: Representative of the Best Intellect and Character of the Nation." *Fortnightly Review* 81 n.s., 1907: 205–214, on pp. 208, 213–214.

rights and privileges of the public. He would see that commons and highways were not encroached upon, that footpaths were kept open, that charity or common lands were used for the benefit of the poor, that nuisances were abated, and that unsanitary conditions were amended or brought to the notice of the authorities. He would be an ex officio member of the educational and administrative boards of his district, and when local self-government becomes established the presence of such a body of men over the country might not improbably ensure success instead of failure.¹⁹⁵

Again not surprisingly, these suggestions largely fell on deaf ears. But what of this idea that the “commons and highways” should not be “encroached upon”? This was part of Wallace’s land nationalization campaign, of which we will hear more in the next chapter. Wallace argued that the roads were commons-lands, in many instances taken from the people illegally by powerful landholders in the distant past. In 1893 he sent a letter suggesting a solution to a related matter that found its way into several newspapers:

A letter has been addressed by Dr. Alfred Russel Wallace, as President of the Land Nationalisation Society, to Mr. Fowler, the President of the Local Government Board, in which the great scientist says – “I beg leave to call your attention to a great want in many parts of the country which can, I think, be remedied by means of a clause in the Local Government Bill, of which you have charge. During many years, I have noticed the great inconvenience to which large numbers of persons are subject, owing to the want of footpaths, or rights-of-way, in growing centres of population, and more especially in connection with access to railways stations. Almost everywhere the approach to these stations, from several directions, is very circuitous, involving unnecessary fatigue and loss of time to all foot-passengers; while the difficulties and expense of obtaining new paths are so great that I have never known an instance of one being made. In a great many cases, however (partially, perhaps, in all), the desired short path could be obtained by a right of way along the railway itself. And, for many other reasons, such as affording pleasant walks where footpaths are scarce, or providing a short-cut between villages and hamlets, such right of way would be beneficial. I believe that railways are legally public highways, subject to special conditions of use. If the company does not provide means of transit, they are bound to allow the use of the road on fixed terms to those who will provide it, and Parliament has interfered in many ways to protect the public. Unfortunately, the use of the lines as footpaths was not specially secured to the public, but I submit that such use follows from the general principle that Railway Acts are granted not for private gain, but for the public benefit, and I urge, therefore, that it be now given by the Legislature in all cases where the Parish or District Councils think it would be useful, such Council making the necessary gates or stiles, and keeping the path in order. The path might in most cases run alongside the railway fence, where there is usually ample room for a single person to walk either at the top of the cutting or the bottom of the embankment, as the case may be. It is hardly likely that the companies would seriously object, since everything that facilitates access to their stations must be for their benefit. If they ask for compensation, the reply will be, ‘You obtained your powers solely for the public benefit; your lines have in many ways affected the public injuriously; the convenience now claimed for the public will do you no injury; you will be put to no expense; nothing will be taken from you; for what, then, do you claim compensation?’ It may no doubt be objected that such a clause will add to the difficulty of passing the bill. I am inclined to think, however, that it would satisfy such a very common want as to be exceedingly popular, and therefore would not be seriously opposed.

¹⁹⁵ “Church Funds: How to Use Them.” *The Daily News* 19 January 1885: 5.

In no other way can so great a public convenience be obtained with so little difficulty and expense."¹⁹⁶

In a letter to the editor printed just a few months later in the *Pall Mall Gazette*, Wallace was downright vitriolic:

Mr. [Auberon] Herbert's whole argument (so far as he adduces any argument) is that land is, and ought to be, absolute private property, like any other articles. It is, in his view, a right and good thing for one man to hold a hundred thousand acres, and limit its use as he pleases. It is right that a man should have the power to turn thousands of people out of their homes at his pleasure. The two million acres of deer forests in Scotland must, on this theory, not only be let alone, but allowed to grow to four millions, if English and American millionaires bid higher for them than those who have been born on the land, and whose ancestors defended it with their blood. It was right and proper that the inhabitants of the village mentioned by Mr. Froude, whose forefathers had lived in it since the Conquest, should have been all cleared away at the whim of a duke or a duke's agents. It is right that the tenants' improvements both in Ireland and England should be confiscated by the landlord, and that nobody should live in his native land except by permission of a limited body who hold the soil, and on any terms they may choose to dictate. Every word of Mr. Herbert's arguments would apply with equal force to defend the territorial rights of the French nobles which brought on the Revolution – which was evidently a wicked attempt to plunder other people's property and to prevent landowners from doing what they liked with their own, unhappily too successful! Nay, more, every argument will equally apply in favour of slavery; the Abolitionists wanted "to take away other people's property," and to prevent people from doing what they liked with that which they had legally bought and paid for.¹⁹⁷

Another letter to the editor, this time to *The Daily News*, continued the same theme with some comments on a law pertaining to land enclosures, and its interpretation:

...Attention should be particularly directed to the fact that by this authoritative declaration of the law, confirmed by a court of appeal, all roadside strips "between hedges" are declared to be parts of the highway "primâ facie, and unless there be evidence to the contrary." Whenever such roadside strips are enclosed it rests on the encloser to first prove his right to the land, the primâ facie right being with the public. It is the duty of the Highway Boards, as representing the public, to prevent every such inclosure until the proprietary right of the encloser is proved; but this they rarely or never do, probably because these boards usually consist mainly of landowners and farmers, who almost all look upon such enclosures with favour.

In the current number of the *Nineteenth Century* Mr. H. R. Grenfell advocates the enclosure of these roadside wastes on the ground that it gives employment to labourers in winter, and provides sites for cottages, gardens, and orchards for the poor; and he terms it an "economic improvement" which the Commons' Preservation Society, Mr. Chamberlain, and Mr. Jesse Collings are trying to prevent by threats of claiming restitution. But he entirely ignores the question of who is the rightful owner of the roadside wastes. The law of the land, as declared by the highest legal authority, says they are primâ facie public property, and therefore the person who encloses and appropriates them is a robber and the possessor of stolen goods. It may fairly be asked why do not the benevolent landlords, who are so anxious to find work for the poor in winter, employ them on land

¹⁹⁶ "Footpaths Along Railways. Letter From Dr. A. Russel Wallace." *The Leeds Mercury* 8 November 1893: 3.

¹⁹⁷ "Mr. Auberon Herbert on Land Prophets." *Pall Mall Gazette* 21 March 1885: 2.

which is legally their own instead of on that which they first steal from the public? Are their estates in such perfect order as to need no improvement? Can gardens and orchards be formed in no other way than by illegally converting public property to private uses?¹⁹⁸

Well! It should now be clear to the reader why Wallace was not a favorite among the power brokers of the time! But his social criticism extended in many directions, well beyond the commons question. One of his favorite targets was militarism, and the “might makes right” issue. Around the turn of the century he took part in a series of back-and-forths with contributors to the egoist magazine *The Eagle and the Serpent*, many of whom were devotees of the philosophy of Friedrich Nietzsche. At one point he wrote:

Sir, – If Mr. Common’s statement of Nietzsche’s teaching and the social reforms at which he aims, are accurate, then, even though some of his *methods* of obtaining social reforms may be good, the reforms themselves seem to me to be both impracticable and worthless, if they are not even retrogressions. Mr. Common tells us that Nietzsche is the apostle of “a true aristocracy,” and of apportioning “advantages and disadvantages respectively to merits and demerits.” If by “advantages” he means material superiority or greater wealth, and that the aristocracy of merit claim this superiority as their right, that alone would, in my opinion, show that they were *not* a true “aristocracy” and that they did *not* really “merit” what they claimed. Again, what is merit, and who is to decide on the merits and demerits of individuals? If it means intellectual, moral, or physical, superiority, or any combination of them, and if these qualities are fully exerted for the benefit of society at large, those who possess and so use their superiority will, under any rational condition of society, receive the greatest reward men can receive – the respect, honour, and affection of their fellows. But such men can only *prove* that they possess such superior qualities and that they are worthy of the honour they will receive, by working and living under *equal* conditions and *equal* advantages with their fellows. Without this absolute “equality of opportunity,” there can be no possibility of accurately determining “merit and demerit” as regards society; hence, I maintain that the only object worth working for, as the first and essential stage towards utilising all the best powers and faculties of a nation for the common good, is, to bring about this “equality of opportunity.” This, however, is simple justice, as between man and man. It is a fundamental axiom of ethics. It is not an “esoteric” doctrine, and it does not need to be upheld by “falsehood,” as apparently does Nietzsche’s system of aristocracy – and from falsehood, esoteric teaching, and a ruling aristocracy, nothing that is of permanent good ever has arisen or can arise. I believe, absolutely, in truth, in justice, and in the free development of human nature, as the only and the essential methods leading to true social reform; and I therefore dissent as strongly as possible from Mr. Common’s principles and methods.¹⁹⁹

On the related subject of eugenics... Certainly Wallace was not a fan of the more extreme eugenicist positions (at one point he referred to the plans on “guided marriage” of Grant Allen – otherwise one of his favorite writers – as “detestable”²⁰⁰), but as a party interested in human improvement he was not altogether against at least some of its goals. Still, in 1912 he was quoted on the subject in an interview:

¹⁹⁸ “Illegal Roadside Enclosures.” *The Daily News* (London) 24 September 1885: 3.

¹⁹⁹ “Nietzsche as a Social Reformer, Or, The Joys of Fleecing and Being Fleeced.” *The Eagle and the Serpent* 15 April 1898: 26–27.

²⁰⁰ “Human Selection.” *Fortnightly Review* 48 n.s., 1890: 325–337, on p. 329.

"But," said Dr. Wallace, with an energy that surprised me, "you must not dream that I approve of any of the modern eugenic heresies that are now being advocated. I feel a little sore on this point," he continued, "because in a popular scientific publication that has just been sent to me, I am referred to as spending the evening of my days in furthering the teaching of eugenics. Wherever did I advocate any such preposterous theories?" he said in scorn. "Not a reference to any of my writings; not a word is quoted in justification of this scientific libel. Where can they put their finger on any statement of mine that as much as lends colour to such an assertion? Why, never by word or deed have I given the slightest countenance to eugenics. Segregation of the unfit, indeed! It is a mere excuse for establishing a medical tyranny. And we have enough of this kind of tyranny already. Even now, the lunacy laws give dangerous powers to the medical fraternity. At the present moment, there are some perfectly sane people incarcerated in lunatic asylums simply for believing in spiritualism. The world does not want the eugenist to set it straight. Give the people good conditions, improve their environment, and all will tend towards the highest type. Eugenics is simply the meddlesome interference of an arrogant, scientific priesthood. There are," he said, "no really bad people; no one absolutely beyond reclaim. That is where our prison system is all wrong. We treat our prisoners as though they were utterly bad. There are none utterly bad, but only different degrees of goodness. When we understand that, we shall give up our absurd ideas of punishing crime, and shall, instead, try to reform the criminal."²⁰¹

Wallace was also a friend of labor. He supported improvements in working conditions, but also had loftier ambitions for the working man:

...for the first time in the history of the world, the workers – the real sources of all wealth and of all civilization – are becoming educated, are organising themselves, and are obtaining a voice in municipal and national Governments. So soon as they realise their power, and can agree upon their aims, the dawn of the new era will have begun.

The first thing for them to do is to strengthen themselves by unity of action, and then to weaken, and ultimately to abolish, militarism. The second aim should be to limit the bureaucracy, and make it the people's servant, instead of its master. The third, to reorganise and simplify the entire legal profession, and the whole system of law, criminal and civil; to make justice free for all, to abolish all legal recovery of debts, and all advocacy paid for by the parties concerned. The fourth, and greatest of all, will be to organise labour, to abolish inheritance, and thus give equality of opportunity to everyone alike. This alone will establish, first, true individualism (which cannot exist under present social conditions), and, this being obtained, will inevitably lead to voluntary association for all the purposes of life, and bring about a social state adapted to the stage of development of each nation and of each successive age.

This, in my opinion, is the ideal which the workers (manual and intellectual workers alike) of every civilised country should keep in view. For the first time in human history, these workers are throwing aside international jealousies and hatreds; the peoples of all nations are becoming brothers, and are appreciating the good qualities inherent in each and all of them. They will, therefore, be guilty of folly, as well as crime, if they much longer permit their rulers to drill them into armies, and force them to invade, and rob, and kill each other.

The people are always better than their rulers.²⁰²

²⁰¹ Frederick Rockell, "The Last of the Great Victorians. Special Interview With Dr. Alfred Russel Wallace." *The Millgate Monthly* August 1912: 657–663, on p. 663.

²⁰² "Anticipations and Hopes for the Immediate Future." *The Clarion* (London) 1 January 1904: 1.

If Wallace had faith in the ability of the people to stand up for what was right, he had fewer illusions about the goals of governments – especially concerning their tendency to use force to get their way:

It is a notorious and undeniable fact that we – that is, our Governments – are, with a few exceptions, hated and feared by almost all other Governments, especially those of the Great Powers. Is there no cause for this? Surely we know there is ample cause. We have either annexed or conquered a larger portion of the world than any other Power. We have long claimed the sovereignty of the sea. We hold islands and forts and small territories offensively near the territories of other Powers. We still continue grabbing all we can. In disputes with the powerful we often give way; with the weak and helpless, or those we think so, we are – allowing for advance in civilization – bloody, bold, and ruthless as any conqueror of the Middle Ages. And with it all we are sanctimonious. We profess religion. We claim to be more moral than other nations, and to conquer and govern and tax and plunder weaker peoples for *their* good! While robbing them we actually claim to be benefactors! And then we wonder, or profess to wonder, why other Governments hate us! Are they not fully justified in hating us? Is it surprising that they seek every means to annoy us, that they struggle to get navies to compete with us, and look forward to a time when some two or three of them may combine together and thoroughly humble and cripple us? And who can deny that any just Being, looking at all the nations of the earth with impartiality and thorough knowledge, would decide that we deserve to be humbled, and that it might do us good?²⁰³

Tirades such as these on particular subjects were not uncommon from Wallace, but he also attached himself to two general social movements: socialism, and anti-vaccinationism.

Late in life Wallace had a fair amount to say about Robert Owen, the utopian socialist, so at first it seems a bit strange that he mentions him only once in his writings predating 1890. Owen and his crowd, it will be remembered, made a strong impression on Wallace while he was living in London as a teenager. But the impact seems to have been more a logical and emotional one than a political and institutional one. Though Wallace could sympathize with Owenists' communal efforts and their humane thoughts, he was less sure that a system-wide form of socialism, extending to the political fabric of the nation, was possible. His mind was changed when in 1889 he read Edward Bellamy's futuristic novel *Looking Backward*. Bellamy, an American journalist, described what seemed to Wallace to be a practicable sequence of societal changes that could lead to a fully socialistic society. His first announcement of his change of mind appeared in a short letter to *Land and Labor*, the Land Nationalisation Society's magazine:

Hitherto I have been doubtful whether Socialism in any form would be the future of humanity, and altogether sceptical of the possibility of carrying out any scheme of Socialism in the present phase of human development. But my opinions on both these points have been changed by a careful study of that remarkable book, *Looking Backward*, which for the first time – so far as I know – sets forth a practicable and altogether unobjectionable scheme of socialistic life, and solves *all* the difficulties of the problem in a most complete and satisfactory manner. My conclusions as to the practicability and advisability of such a scheme of social economy as Mr. Bellamy expounds in no way affects

²⁰³ "Practical Politics." *The Clarion* (London) 30 September 1904: 1.

my advocacy of Land Nationalisation, which I believe to be – *so far as this country is concerned* – the indispensable preliminary to any realisation of Mr. Bellamy's views. I shall therefore continue to advocate it as earnestly as I have hitherto done, while I shall not advocate any of the less complete and more or less objectionable forms of Socialism usually propounded in this country.²⁰⁴

Obviously Wallace was not worried about any possible incompatibilities between socialism and land nationalization, and in fact he stuck to this position from then on. This is evident in his several later writings on railway nationalization, and discussions of park lands and mining interests. He continued to believe, however, that land nationalization was a necessary preliminary to the initiation of a socialistic system.

Wallace's interest in the vaccination issue was ignited in the late 1870s, when he began to review some statistics on smallpox incidence that seemed to indicate that the rate of outbreaks was more related to public health standards than it was to vaccination. He then read accusations of falsification of records within the medical community, and how people who refused vaccination were being fine or jailed. In 1890 he summed up his feelings during a period of examination by a Royal Commission set up to examine the question:

During the course of my examination, I have been asked questions which implied that I had taken up this subject and written on it without the full and accurate information befitting a man of science. I admit that this is, to some extent, true; but my answer is that I did not take it up as a question of pure science. If it had remained a question of medical science and practice, I should not have troubled myself about it, and certainly not have written on it. But from the moment when, through the great influence of the medical profession, a medical dogma was enforced by penal law, it became a question of politics, a question of personal liberty. When almost every week I read of men fined or imprisoned for refusing to subject their children to a surgical operation which they (and I) believed to be, not only useless, but injurious and dangerous, I felt impelled to aid, if ever so little, in obtaining a repeal of a cruel and tyrannical law. I could not wait years to study the question in all its intricacies and obscurities while men were being daily punished, as I believed, unjustly. Liberty is, in my mind, a far greater and more important thing than science . . .²⁰⁵

Wallace's investigations of the vaccination question were largely ignored by the medical community. Nevertheless they were quite innovative in their own right. Instead of confining himself to the opinions of doctors, who generally had little conception of statistics-based thinking, he delved into the smallpox incidence data itself and through comparative analysis became one of the first statistical epidemiologists. Appreciation of his forward-looking thinking in this realm has been slow in coming, although it is entirely possible that by the end of the nineteenth century vaccination actually was killing more people (especially, through unsanitary vaccines and administration techniques) than it was saving. Eventually, in the twentieth century, mandatory vaccination was repealed, though by then smallpox was no longer a major problem. Recent analyses suggest that his work has been under-rated, though gaps in the statistical record itself may make it impossible to determine just how much.²⁰⁶

²⁰⁴ Untitled letter. *Land and Labor* November 1889: 7–8.

²⁰⁵ Untitled testimony. *The Vaccination Inquirer and Health Review* 12, 1891: 164–168, on p. 168.

²⁰⁶ Fichman, Martin, and Keelan, Jennifer E., "Resister's Logic: The Anti-vaccination Arguments of Alfred Russel Wallace and Their Role in the Debates over Compulsory Vaccination in England, 1870–1907" (*Studies*

One thing about Wallace's involvement in the anti-vaccination movement: his perspective has often been twisted into something he didn't hold. In an 1895 letter to the Editor he wrote:

...Mr. Wheeler says that he could not agree with my conclusion that "Vaccination may have caused more deaths than smallpox itself." This I am not surprised at, because I do not myself accept such a statement, which is certainly not mine. My words, carefully chosen, are – "an operation which has admittedly caused many deaths, which is probably the cause of greater mortality than smallpox itself" – and I call attention to the change from the past tense in the first part of the passage to the present tense – "is probably the cause" – in the latter part. This clearly means, not that "Vaccination may have caused more deaths than smallpox" – as Mr. Wheeler states it, without any limitation of time, which would of course be an absurdity – but that, at the *present time*, as the result of general Vaccination for about fifty years, it may *now* be the cause of more deaths than smallpox. This conclusion is drawn from the table of the steadily-increasing mortality from certain inoculable diseases (page 24 of my pamphlet), which *increase*, in thirty years (1850-1880), was 357 per million (an increase which has continued since), while the deaths from smallpox have not, for many years, averaged more than *one-fifth* of this amount. If, therefore, only *one-fourth part* of the large and steady increase of these diseases is due to Vaccination, then my belief that Vaccination *is now* the cause of greater mortality than smallpox itself is fully justified; and in the contention that this is "probably" the case I do not think that I shall find myself in the minority among the readers of the *Inquirer*. This indirect effect of Vaccination is further increased by its direct effects, which are now known to be far more terrible, and to produce far greater mortality than was formerly suspected or admitted.²⁰⁷

These examples of Wallace's interventions into what he saw as unfairnesses could be greatly extended. He also wrote essays or letters to the editor on a number of other subjects, for example: the alcoholic beverages traffic, protecting archaeological monuments and artifacts, the distribution of wealth, poverty, women's suffrage, wages, the use of Sundays by Sabbath-keepers, unemployment, national defense, strikes, immigration and emigration, vivisection, crime and punishment, colonialism, insurance, and Irish home rule. Dozens of related items are available for perusal online at the author's *The Alfred Russel Wallace Page*.²⁰⁸

Lastly, we may mention Wallace's contributions to education. These came in several forms. In addition to some publications on library and museum organization and part-time work for many years as a writer and corrector of national exams on geography, Wallace's books provided their own kind of inspiration for laypersons and scientists-to-be. A very good writer who knew how to employ graphics to full advantage (including, for example, the "faunal diorama" compilations in *The Geographical Distribution of Animals*, and his epidemiological graphs in *Vaccination a Delusion*), many of his books went through numerous editions and have remained popular for generations. But even within the area of education he would not allow himself to unilaterally approve all ventures. Consider his reasons, as stated in a letter to the editor printed in *Nature* in 1870:

in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences 38, 2007: 585–607); Weber, Thomas P., "Alfred Russel Wallace and the Antivaccination Movement in Victorian England (*Emerging Infectious Diseases* 16, 2010: 664–668).

²⁰⁷ "Forty-five Years' Registration Statistics. A Correction." (*The Vaccination Inquirer and Health Review* 1 February 1895: 159–160.

²⁰⁸ See especially the subject listings page, at: <http://people.wku.edu/charles.smith/wallace/bib5.htm> .

The public mind seems now to be going mad on the subject of education; the Government is obliged to give way to the clamour, and men of science seem inclined to seize the opportunity to get, if possible, some share in the public money. Art education is already to a considerable extent supplied by the State, – technical education (which I presume means education in “the arts”) is vigorously pressed upon the Government, – and Science also is now urging her claims to a modicum of State patronage and support.

Now, sir, I protest most earnestly against the application of public money to any of the above specified purposes, as radically vicious in principle, and as being in the present state of society a positive wrong. In order to clear the ground let me state that, for the purpose of the present argument, I admit the right and duty of the State to educate its citizens. I uphold national education, but I object absolutely to all sectional or class education; and all the above-named schemes are simply forms of class education. The broad principle I go upon is this, – that the State has no moral right to apply funds raised by the taxation of all its members to any purpose which is not directly available for the benefit of all. As it has no right to give class preferences in legislation, so it has no right to give class preferences in the expenditure of public money. If we follow this principle, national education is not forbidden, whether given in schools supported by the State, or in museums, or galleries, or gardens, fairly distributed over the whole kingdom, and so regulated as to be equally available for instruction and amusement of all classes of the community. But here a line must be drawn. The schools, the museums, the galleries, the gardens, must all alike be *popular* (that is, adapted for and capable of being fully used and enjoyed by the people at large), and must be developed by means of public money to such an extent only as is needful for the highest attainable *popular* instruction and benefit. All beyond this should be left to private munificence, to societies, or to the classes benefited, to supply.

In art, all that is needed only for the special instruction of artists, or for the delight of amateurs, should be provided by artists and amateurs. To expend public money on third-rate prints or pictures, or on an intrinsically worthless book, both of immense value on account of their rarity, and as such of great interest to a small class of literary and art amateurs and to them only, I conceive to be absolutely wrong. So, in science, to provide museums such as will at once elevate, instruct, and entertain all who visit them is a worthy and a just expenditure of public money; but to spend many times as much as is necessary for this purpose in forming enormous collections of all the rarities that can be obtained, however obscure and generally uninteresting that they may be, and however limited the class who can value or appreciate them is, as plainly, an unjust expenditure. It will, perhaps, surprise some of your readers to find a naturalist advocating such doctrines as these; but though I love nature much I love justice more, and would not wish that any man should be compelled to contribute towards the support of an institution of no interest to the great mass of my countrymen, however interesting to myself.

For the same reason I maintain that all schools of art or of science, or for technical education, should be supported by the parties who are directly interested in them or benefited by them. If designs are not forthcoming for the English manufacturer, and he is thus unable to compete with foreigners, who should provide schools of design but the manufactures and the pupils who are the parties directly interested? It seems to me as entirely beyond the proper sphere of the functions of the State to interfere in this matter as it would be to teach English bootmakers or English cooks at the public expense in order that they may be able to compete with French *artistes* in these departments. In both cases such interference amounts to protection and class legislation, and I have yet to learn that these can be justified by the urgent necessity of our producing shawls and calicoes, or hardware and crockery, as elegantly designed as those of our neighbours. And if our men of science want more complete laboratories, or finer telescopes, or more expensive

apparatus of any kind, who but our scientific associations and the large and wealthy class now interested in science should supply the want? They have hitherto done so nobly, and I should myself feel that it was better that the march of scientific discovery should be a little less rapid (and of late years the pace has not been bad), than that Science should descend one step from her lofty independence and sue *in formâ pauperis* to the already overburdened taxpayer. So if our mechanics are not so well able as they might be to improve the various arts they are engaged in, surely the parties who ought to provide them with the special education required are the great employers of labour, who by their assistance are daily building up colossal fortunes; and that great and wealthy class which is, professionally or otherwise, interested in the constructive or decorative arts. ...

The very common line of argument which attempts to prove the wide-spread uses and high educating influences of art and of science, are utterly beside the question. Every product of the human intellect is more or less valuable; but it does not therefore follow that it is just to provide any particular product for those who want it, at the expense of those who either do not want, or are not in a condition to make use of it. Good architecture, for instance, is a very good thing, and one we are much in want of; but it will hardly be maintained that architects should be taught their profession at the public expense. The history of old china, of old clothes, or of postage stamps, are each of great interest to more or less extensive sections of the community, and much may be said in each case to prove the value of the study; but surely no honest representative of the nation could vote, say, the moderate sum of a million sterling for three museums to exhibit these objects, with a full staff of beadles, curators, and professors at an equally moderate expenditure of £10,000 annually, and a like sum for the purchase of specimens. But if we once admit the right of the Government to support institutions for the benefit of any class of students or amateurs however large and respectable, we adopt a principle which will enable us to offer but a feeble resistance to the claims of less and less extensive interests whenever they happen to become the fashion.

If it be asked (as it will be) what we are to do with existing institutions supported by Government, I am at once ready with an answer. Taking the typical examples of the National Gallery and the British Museum, I maintain that these institutions should be reorganised, so as to make them in the highest degree entertaining and instructive to the mass of the people; – that no public money should be spent on the purchase of specimens, but what they already contain should be so thoroughly cared for and utilised as to make these establishments the safest, the best, and the most worthy receptacles for the treasures accumulated by wealthy amateurs and students, who would then be ready to bestow them on the nation to a much greater extent than they do at present. From the duplicates which would thus accumulate in these institutions, the other great centres of population in the kingdom should be proportionately supplied, and from the Metropolitan centres trained officers should be sent to organise and superintend local institutions, such a proportion of their salaries being paid by Government as fairly to equalise the expenditure of public money over the whole kingdom, and thus not infringe that great principle of equality and justice which I maintain should be our guide in all such cases.²⁰⁹

Thus, Wallace the “socialist libertarian”! But, it should be noted, that only in rare instances did he *only* complain about the things he felt were wrong – in most instances he was also there with a suggestion as to how to rectify the ill. This, after, all, was how society evolved...

²⁰⁹ “Government Aid to Science.” *Nature* 13 January 1870: 288–289, on pp. 288–289.

Chapter Eight. Wallace On . . .

In this our final chapter we return to the format of Chapter One, which dealt with a number of personal matters in Wallace's life. Here, we will take a look at three subjects connected with Wallace's professional life that are less well known, and concerning which new materials or views have emerged in recent years.

Wallace on Astronomy

It will perhaps surprise the reader that Wallace had any connections with astronomy, but in fact he maintained an interest in the subject for practically his entire adult life. Early on this interest stemmed from his work as a surveyor. Surveying is bound up with the subject of geodesy, the study of the size and shape of the earth, and it is a very short step from there to astronomy.

As mentioned earlier, one of Wallace's first ventures into the world of science was a short description of a process he envisioned for manufacturing a new kind of telescope mirror, sent to the prominent photographer Fox Talbot in 1843. Wallace understood that gravity could be used to pool mercury into a nearly perfect plane, and that an electroplating process could then be used to attach another metal to it, thereby creating a perfectly flat mirror. Wallace also made a suggestion to Talbot as to how to fashion curved mirrors, which at the time were cast and then ground by hand, only to quickly tarnish and require constant re-polishing. Many years later another mercury-based telescope technology, liquid spinning mirror telescoping, would actually come to be.

Wallace's interest in geodesy and astronomy resurfaced in the 1860s after his return to England from the East. In 1866 he sent a couple of replies to comments made by flat-earthiers in the magazine *Reader*, including the following classic description of the derivation of longitude and latitude lines:

The fact (universally stated in works on astronomy and geodesy) that degrees of the meridian *increase* in length towards the poles, on account of the earth's *compression* at the poles, is, indeed, one well calculated to mystify a mere mathematician, though it is clear enough to anyone who reflects on the various conditions involved in the problem. If we look at the diagram of a sphere, and the space from the equator to the pole be divided into equal parts subtending angles of one degree each at the centre, and we then flatten the poles by cutting off a portion with a curve of greater radius, it is evident that the distance from the pole to the centre of the sphere will be shorter than before, and therefore, that degrees of latitude, *measured angularly from that centre*, would really diminish in length from the equator towards the poles.

But in our actual rotating globe, the unequally curved surface is one of equilibrium, owing to the varying centrifugal force at different latitudes; and, as degrees of a meridian can only be measured upon the surface by *tangents* or *perpendiculars to it* (obtained by the *spirit-level* or the *plumb-line*), it follows that a degree at the pole, measured by an angular instrument from the earth's centre, would not represent a degree of latitude, because the curvature of the polar regions has its centre much further off than the earth's centre of gravity, and a degree measured on the surface would therefore be longer. The *centre of curvature* of the earth's surface rarely coincides with the centre of gravity, and a plumb-line will therefore not always point directly to that centre. It will do so only at the

equator and the pole. Everywhere else adjacent plumb-lines will meet at points within or beyond the centre, according as the curvature of the surface is less or greater than the mean curvature of the globe. The flattened polar regions are, for the geometer, portions of a larger sphere; the protuberant equator (as far as latitude is concerned) is part of a smaller one; and degrees of the meridian measured on these parts must be respectively longer and shorter than what would be due to the mean curvature of the globe.²¹⁰

This ended that discussion for the time being, but several years later, in 1870, Wallace made the mistake of entering into a wager with another flat-earthier that he, Wallace, could not prove to an independent referee's satisfaction that the earth is spherical, and not flat. In a famous experiment on a straight, six-mile stretch of the Bedford Canal in England, Wallace used a telescope to show that, in fact, the middle of the stretch appeared to "bulge upward," concealing the bottom part of a marker that had been put at the other end, at water level. The referee came down on Wallace's side, but the man would neither agree to the findings, nor pay off the wager. He also began to slander Wallace and threaten his family, for which he was brought to court and spent time in jail. Wallace never collected a penny, and continued to receive abuse from him for the next fifteen years.²¹¹

Meanwhile, he was beginning to pursue an interest in earth and astronomical studies related to his work on evolution. In 1867 he penned a review of glacial features that brought out his special interest in the glacial origins theory of alpine lake evolution propounded several years earlier by the geologist William Ramsay.²¹² The reason for this new direction is not fully apparent, but within a year or two he was beginning to correspond with the astronomer/climatologist James Croll, ostensibly as part of a general program of investigation of the larger scale influences on the geographical distribution of life. In 1862 and 1865 the physicist William Thomson (later Lord Kelvin) had dropped a bombshell into the evolutionists' camp with his (as it turned out incorrect) conclusion that the Sun might not be old enough to support an evolutionary process of the type suggested by Darwin and Wallace. This provided an immediate impetus for looking more carefully into the long-term patterns of evolution on earth, and their geological and climatological influences. In 1870 Wallace provided one argument in defense of the evolutionists' position by attempting some calculations on the age of the earth based on surface denudation and sedimentation rates.²¹³ The argument makes heavy use of Croll's theory that variations in the eccentricity of the earth's orbit might be related to the onset of the glacial periods. Wallace concludes:

The only argument I consider new in this paper, is that derived from the uniformity of climate during the last 60,000 years, and the alternations of heat and cold for a long time previously, leading to a slower change of species since the glacial epoch than at any former period, thus allowing us to suppose change of form in the organic world to go on more rapidly than we had before thought possible . . . Much of the force of my argument appears to depend upon the accuracy of Mr. Croll's view, that, during a time of great excentricity, there will be in each hemisphere alternately a glacial epoch for about 10,500 years, and a perpetual spring or summer for about an equal period. But Sir Charles Lyell argues, with

²¹⁰ "Is the Earth an Oblate or a Prolate Spheroid?" *Reader* 19 May 1866: 497.

²¹¹ *Reply to Mr. Hampden's Charges Against Mr. Wallace* (J. J. Tiver, 1871); Garwood, Christine, *Flat Earth: The History of an Infamous Idea* (Macmillan, 2007).

²¹² "Ice Marks in North Wales (With a Sketch of Glacial Theories and Controversies)." *Quarterly Journal of Science* 4, 1867: 33–51.

²¹³ "The Measurement of Geological Time." *Nature* 1, 1870: 399–401, 452–455.

great force, for the opposite view, that the cold of one period would be continued through the other, and that during the whole continuance of a phase of high excentricity both hemispheres would be in a state of glaciation. Supposing this view to be the true one, it will not very materially affect my argument, for the diagram shows many comparatively rapid alternations from a very high to a very low excentricity, which would also be from a glacial to a temperate climate and would certainly tend to comparative rapidity of specific change; while in each 10,500 years there would, no doubt, be some retreat and advance of the snow line, followed by a less amount of migration, competition, and variation. During the last 60,000 years, on the other hand, the change of excentricity has been hardly perceptible, and the change of organic forms may be supposed to have been far below the average.

Ten years later Wallace continued this line of thinking in his book *Island Life*, over one hundred pages of which is devoted to setting out a full geographical/astronomical theory of the causes of the Ice Age. In the 1890s Wallace would also write more on the theory of the glacial origin of alpine lakes, effectively ending the argument.²¹⁴

Wallace's interest in astronomy *per se* was ignited in 1896, when he was asked to give a lecture at Davos, Switzerland, on scientific progress in the nineteenth century. This lecture was expanded into a full book, *The Wonderful Century*, in 1898, one chapter of which summarized important discoveries in the field from the past one hundred years. In the course of his review, he began to piece together a theory that the Sun was at the center of the known universe, and that this had consequences for the uniqueness of earth, as a life-bearing body. In 1903 he expressed these views as an essay published in the *Fortnightly Review*. It elicited a lot of attention, and he was asked to write a whole book on the subject. This appeared in late 1903 under the title *Man's Place in the Universe* (a month or two earlier a new edition of *The Wonderful Century* was also released in which the section on astronomy had been enlarged to four chapters).

Wallace would eventually back down on the idea that our solar system is at the very center of the universe, but he continued to argue that our particular physical position and size were the critical ingredients for producing advanced life-forms, and that this combination of conditions must be so rare as to make advanced life-forms elsewhere unlikely. There has been some confusion on this subject; many sources have described him as saying that *life* could exist nowhere else, but his actual views were stated in an interview published in December 1903:

"I need hardly say, I suppose," replied Dr. Wallace, "that I have never suggested that this earth alone in the whole universe is the abode of life. What I do say is, first, that our system appears to be in or near the centre of the visible universe; and, second, that all the available evidence supports the idea of the extreme unlikelihood of there being on any star or planet revealed by the telescope – I won't say life, but any intelligent being, either identical with or analogous to man. For myself, I confess that I find it difficult to imagine that there can be in the universe, under one supreme Head, a great number of quite differently-formed, but equally intelligent, beings."²¹⁵

²¹⁴ "The Ice Age and Its Work." (*Fortnightly Review* 54 n.s., 1893: 616–633, 750–774); Tinkler, Keith, "Wallace and the Great Ice Age" (in Charles H. Smith & George Beccaloni, eds., *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace*, Oxford University Press, 2008: 186–200).

²¹⁵ Dawson, Albert, "A Visit to Dr. Alfred Russel Wallace" (interview). *The Christian Commonwealth* 10 December 1903: 176–177.

Wallace's opinions as set out in *Man's Place in the Universe* qualify him as one of the originators of the anthropic principle, a developing theory as to why the universe contains life, and especially *conscious* life. Wikipedia, in the opening statement under its "Anthropic Principle" entry,²¹⁶ describes it: "In astrophysics and cosmology, the anthropic principle is the philosophical consideration that observations of the physical Universe be compatible with the conscious life that observes it. Some proponents of the anthropic principle reason that it explains why the Universe has the age and the fundamental physical constants necessary to accommodate conscious life. As a result, they believe that the fact is unremarkable that the universe's fundamental constants happen to fall within the narrow range thought to be compatible with life." The idea itself has evolved in several directions (identifying, for example, "strong" and "weak" anthropic principles) depending on the degree to which the eventual emergence of consciousness is treated as a necessary consequence of cosmological organization, or even its purpose.

Wallace's views on the probable uniqueness of earth as a home for consciously aware beings met an interesting challenge just a few years later in 1906 when the astronomer Percival Lowell published a book, *Mars and Its Canals*, that outlined his belief there were advanced beings living on Mars. Lowell and a few other astronomers who had access to good telescopes had come to this conclusion largely on their observations of what seemed to be a series of long, straight, intersecting features stretching across the surface of that planet. They seemed to resemble canals, and it was reasoned that beings capable of engineering such a structure must be of advanced intelligence. Wallace was not so sure. In his *Is Mars Habitable?* (1907), he undertook an analysis of what the Martian surface might be like, given known principles of astronomy, physical geography, and climatology, and came to some contrary conclusions. The surface of Mars must be rather cold and dry he thought, dry enough that the "advanced beings" living there would be fools to attempt to move water across the surface in open canals. Further, he guessed that the ice caps were not water to begin with. Wallace's assessment of surface conditions were not far off-base (he also fairly closely estimated its surface albedo), but his theory of the origin of the "canals," that they were fissures originating from crater formation, was incorrect. Actually, as it so turned out, there were no canals: the "observed" markings arose from imperfections inherent in the optics of the telescopes themselves.

Wallace's concerns over the probable or improbable existence of living things elsewhere in the universe, coupled with his scientific approach to the study of surface environments (astronomers had not been doing much in that direction before then) should have earned him some respect as one of the founders of the science of astrobiology (also known as exobiology), but he is only rarely thought of in this context. Still, were he alive today he might be pleased to hear that there are impact craters on both the Red Planet and the Moon named after him.

Wallace on Economics

²¹⁶ "Anthropic Principle," http://en.wikipedia.org/wiki/Anthropic_principle (accessed 19 July 2012).

No one would consider Wallace an economist *per se*, but he gave some fair amount of thought to a number of economic questions, and came up with a few ideas of lasting interest and influence.²¹⁷ Primary among these were his thoughts on land economics.

Although before the age of about fifty Wallace spent most of his time studying natural history, he had not totally neglected economic philosophy, being aware early on of writers such as Thomas Malthus, Adam Smith, and John Stuart Mill. More importantly, however, his work for his older brother, which went on for six or seven years, kept him in the field for long periods of time, during which he learned much about practical agriculture. A lot of their work was for the Tithe Commutation and Enclosure Commissioners, so he also learned much on how small landholders were being discriminated against. Later, during his travels in South America and the East, he observed how some other landholding systems worked, and, as he wrote in 1885:

After returning home from abroad in 1862 I lived a few years in London, but since then have always resided in the country, and having acquired from Herbert Spencer the great principle that private property in land was absolutely wrong, I ever kept the subject in my mind, seeking out a mode by which this wrong might be practically and equitably abolished. About eight or ten years ago I began to see my way, and as soon as I had finished the various scientific works which were the result of my twelve years of tropical exploration, I put my ideas in order and wrote the article "How to Nationalise the Land," which appeared in the *Contemporary Review* in Nov., 1880, and which I believe led to the formation of this Society.²¹⁸

"This Society" was the Land Nationalisation Society. Wallace became its first president, holding that title for a more than thirty year period, ending only with his death. The organization was dedicated to removing ownership of the land from the hands of large holders; it ultimately was only semi-successful in this, but it did, at least, continue to agitate on the subject until other kinds of solutions emerged. The LNS promoted a strategy of divestiture of large land holdings that Wallace himself devised. He explained this in a 3 October 1881 letter to the editor of *The Mark Lane Express*:

Sir, — As you have done me the honour to refer in your issue of the 19th September to my practical scheme of Land Nationalisation, I ask permission to occupy a little of your space with a brief exposition of the scheme, with some indication of its wide scope and of the numerous social evils it is calculated to ameliorate . . .

It is necessary to premise that Land Nationalisation is not proposed in the interest of any class, but as a reform, vital to the national welfare, and at the same time directly beneficial to every class and every individual. By its means the farmer will obtain that freedom of action, that fixity of tenure, and that absolute security of possession of all the proceeds of his labour, skill, and capital, which is what he sorely needs, but which he will assuredly not get by means of any probable or possible English Land Bill. So long as he is subject to landlords and agents, to law-courts and lawyers, to valuers and surveyors, he will often have to keep up a hard and costly struggle in order to obtain that simple right to the fruits of his own labour which he ought to have and may have, without the interference

²¹⁷ For complementary reviews of Wallace's thoughts on economics, see: Stack, David A., "Out of 'the Limbo of Unpractical Politics': The Origins and Essence of Wallace's Advocacy of Land Nationalization" (in Charles H. Smith & George Beccaloni, eds., *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace*, Oxford University Press, 2008: 279–304); Collard, David, "Alfred Russel Wallace and the Political Economists" (*History of Political Economy* 41, 2009: 605–644).

²¹⁸ "President's Address." In *Report of the Land Nationalisation Society. 1884–5*. (Land Nationalisation Society, 1885): 5–15, on p. 15.

of any man and without the possibility of dispute. In fighting for an English Land Bill on the lines of that just passed for Ireland, he will have to fight almost alone, for no other class will have a sufficiently direct interest in the matter to help him with any energy or enthusiasm; but in claiming Land Nationalisation he will have cordial and earnest assistance from all classes, especially from the agricultural labourers and the rural population generally, from mechanics and tradesmen, and from that large class who look forward with longing eyes to a rural retirement for their latter years, now rendered almost unattainable under land monopoly.

In the space of a single letter it is impossible to discuss those general principles and practical examples which prove private property in land to be inconsistent with personal freedom and antagonistic to true national welfare; I will, therefore, pass on at once to the practical proposals by which Land Nationalisation may be brought about, and in doing so, I shall be able briefly to advert to its far-reaching beneficial influence on every portion of the community.

Much of the difficulty and confusion of thought attending questions of this nature arise from not clearly distinguishing the two distinct elements in all landed property, the payment for the use of which is improperly included in the term "rent." True rent is money paid for the use of land or other natural agents; and its value is determined by two factors – the quality or productiveness of the land itself, and the additional value given to it by the community at large, in providing public roads, railroads, or canals, in supplying labour as well as social, religious, and educational advantages, and in furnishing good markets and a surrounding population able at once to satisfy the wants and to be purchasers of the produce of the agriculturist. None of this value has been created either by the owner or occupier of land, and it is this alone which it is proposed shall become the property of the State, the holder paying a *quit-rent* or *ground-rent* to the State, just as he now pays his land-tax, but being free from all Government supervision or interference whatever. The other portion of the value included in "rent" (but which is really interest on money expended and compensation for deterioration) is derived from the outlay or labour of the owner or occupier, in houses and buildings, fences, private roads, drains and other permanent improvements. These are private property, and there is no need to interfere with the possession or use of them other than to declare that their owner for the time being must be the State's tenant and be thus liable for the quit-rent; or, to put it more clearly, whoever holds land from the State must be the owner of the "improvements" of whatever kind on that land. It will therefore be convenient to term these improvements collectively the "tenant right" of the land in question, since their owner is necessarily and by "right," the State's tenant of the land. This "tenant-right" will follow the law of all other personal property, so far as its capability of being bought and sold or bequeathed at the will of the owner, and it thus carries with it all the rights and privileges which pertain to a freehold, with this important reservation, that it can be held only for personal occupation and enjoyment – not as an investment. All subletting of land will thus be illegal, since, if it were once permitted, large quantities of land would be accumulated by capitalists as State tenants, and *their* tenants would be in exactly the same position as the tenants of existing landlords, equally subject to their capricious interference, equally unable to secure the fruits of their own labour.

It will now be asked, How are present or future farmers to obtain possession of this "tenant-right," without which, they cannot hold farms? This question can be best answered while explaining the process by which the land may actually become the property of the State and the new *régime* be inaugurated.

The Act of Parliament effecting nationalisation will provide: –

1. That ten years (more or less) after the passing of the Act the whole land of the country (as above defined) will become the property of the State, the existing landowners being compensated in a way to be presently explained.

2. That a careful valuation of the land of the whole kingdom be made, separating the annual value of the land (or the “quit-rent”) and the improvements (or “tenant-right”). The “quit-rent” will be the amount payable to the State, while the “tenant-right” must be purchased or otherwise acquired by the occupier. The value of the tenant-right will be estimated by the official valuers, as it will depend upon the more or less permanent character of the improvements; and it will have to be paid to the landholder by any farmer who wishes to continue in his farm, either in one sum or by means of a terminal annual charge for a moderate number of years. The ten years’ interval between the actual passing of the Act and its coming into operation will not only give the necessary time for making the required valuation (which must be on every separate plot or enclosure), but it will also allow farmers to make all necessary arrangements for acquiring the tenant-right of their farms or of others more suitable to them. No doubt an extensive re-arrangement of holdings would then take place. A man with the power of getting a farm which he would be absolutely free to cultivate or improve as he pleased, and with a permanent tenure, would often prefer a much smaller one than that which he now holds under a landlord, since it would be his interest to farm highly and make all possible permanent improvements to the property.

The farmers, as a class, would thus obtain all they have ever asked or can possibly desire – freedom of cultivation, freedom of sale or transfer, a permanent tenure, and a really fair rent; and, accompanying this, there would accrue, in a very short time, diminished taxation, diminished poor-rates, and better local markets.

Turning now to the present landholders, or landlords, they will be paid, as we have seen, the fair value of all profitable outlay on the land made by themselves or their immediate predecessors, and often for that made by successive generations of tenants as well. For that portion of the value of the land which was primarily derived from the State, and should never have been given up by it, they will be compensated by means of an annuity of its full estimated value. In order that no valid claim or expectancy may be left unsatisfied, it is proposed that this annuity should extend to all heirs living at the time when the Act comes into operation, or, if thought fit, it might be extended to two generations of heirs beyond the present landholder. The absolute security of this Government annuity for three generations, free from all risks and liabilities, would render it a very fair equivalent for the land taken; and as no land whatever could then be obtained on any other terms than as a State tenant, it is not improbable that the selling value of farms after the Act was passed might be quite up to their previous average market value, because most farmers with capital would seek the opportunity of obtaining, at the earliest possible period, such farms as would suit them for permanent occupation.

Having thus shown how the scheme would affect the existing landholders and the farmers, let us turn to that portion of it which most interests other classes, and which, when clearly understood, will enlist them all as powerful advocates for its adoption. But this must form the subject of another letter.

Wallace’s ingenious system for transferring ownership of the land from large landholders to the State, based on differentiating between native value of location and any improvements made thereon, was never implemented, though it might work even today in certain circumstances. For example, the principles might be applied to the circumstances of private land conservation trusts, or to the setting aside of lands for native peoples or the public’s recreational use.

Over his long life Wallace made other suggestions regarding matters of economics policy; most of these were designed to improve the circumstances of life at the level of the average person, rather than assuage capitalism and capitalists *per se*. He often denigrated the old “political economy” framework, arguing instead for more enlightened programs of a “social economy” sort. His work in this direction arguably presaged some of the efforts of the Progressive movement, a decade or two later.

Wallace also wrote some influential essays on monetary policy. He believed that a sound monetary policy should feature controls on price level. Once a weighted price index measure of stable prices was identified, an institutional body could be set up that would control rate of issue of paper money, and the object of stable prices achieved. He outlined this scheme in a short essay entitled “A Complete System of Paper Money” in 1898:

. . . A gold currency is supposed to be necessary in order that we may have money which is a measure of value as well as a tool of exchange. It is, however, now admitted that gold is not a permanent and stable measure of value, though I believe it is much more nearly so than is generally supposed. Most of the money specialists believe that for many years past the value of gold has been rising, basing their conclusion on the continual reduction in price of most commodities. But it is evident that the price of goods may be greatly reduced by improved machinery and production on a larger scale, and it seems to me that in the case of most of our manufactured goods this cause alone is sufficient to have reduced prices much more than they have actually been reduced; and in that case gold will have *diminished*, not increased in value, as the enormously increased production during the last half-century would lead us to think it should have done.

The usual objection to paper money is that it will change in value according to the amount issued, as is well seen in all countries where the Governments have tried to raise funds by such over-issues. This is quite true; but it is this very property of paper money that makes it easy to keep its value stationary, and, therefore, renders it, when the issue is properly regulated, a better and more stable measure of value than gold, or than any single commodity whatever. How this stability can be attained, I will now endeavour to explain.

Stability, or equality of purchasing power at different times, can only be known by the same nominal amount of money – say, £100 or £1,000 – being able to purchase the same quantities of all the chief necessities of life on the average. Luxuries used by the few – ornaments, jewellery, works of art, &c. – may be left out of consideration. As necessities of life, we may take the four great groups of food, clothing, houses, and fuel; and each of these may be represented by a limited number of the most important items, as bread, meat, potatoes, sugar, tea, and beer, to represent food; timber, iron, bricks, and glass for houses, or a larger number of items if thought advisable by experts. Having fixed upon the list of commodities – perhaps 50, perhaps 100, in all – which are considered to be amply sufficient as the basis of an estimate of the purchasing power of money, the next step will be to estimate the proportionate quantity of each consumed in the whole kingdom, or in some representative part of it, during a year. This is necessary in order to give to each its proper weight in the estimate; for if 100 tons of A and 1,000 tons of B are used per annum, it will lead to very erroneous conclusions if we were to use equal quantities of each in our estimate, and I believe that this very mistake has been made in the estimation leading to the conclusion that gold has for many years been appreciating in value. Having now got our typical list of commodities with the proportionate quantities of each, we next have to get the average price for a series of years – seven, ten, twenty, or whatever number may be fixed upon as the basis on which to calculate the standard purchasing power of our new national currency. All these facts can be got at with sufficient accuracy by means of

agricultural and commercial statistics and market prices. When completed, a table will be constructed something in this form:

Proportions of standard products consumed, and their value on the average of seven years – 1890–1896:

Bread	10,000 lbs.	value £50
Meat	4,000 "	" £200
Sugar	1,500 "	" £10
Tea	500 "	" £40
Timber	1,000 cub. ft.	" £100
Coal	200 tons	" £200

&c., &c., &c. . . .	£600
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These proportions and prices are put down at a mere guess, but when obtained as accurately as possible for the whole of the 50 or more commodities chosen, we shall have, as a result, that these quantities of these commodities have, on the average of the last seven (or 10 or 20) years' cost a certain gross sum. Now, what I maintain is, that paper money (called credit-notes, or anything you like) can be so issued as, for any number of years, to continue to purchase the same quantities of this whole series of commodities for approximately the same nominal amount. Some of the items will, of course, rise in value from one year to another, and others will fall: but the paper currency will always, within very small limits of variation, purchase the same total amounts.

To do this, a Minister, or Commissioner of Currency, with a sufficient staff of clerks, will be appointed, whose duty it will be to have regular returns made of the market prices of the standard commodities week by week, and to have the averages calculated. If during any month or quarter these averages are seen to fall continuously, that is, everything becomes cheaper, he will advise the Treasury to issue more notes which they will bring into circulation (by using them to pay salaries and current expenses) till the fall is checked and the true average reached. When, on the other hand, the standard goods show a rise in price, it indicates that there is a slight surplus of the currency, which is to be checked by cancelling old notes as they come back to the Treasury. This process could be so nicely regulated that, practically, there would be no rise or fall of prices on the average, since either would be remedied before it could possibly be detected by the public.

Here, then, we should have a most useful and portable currency – which could be issued for any amounts in very thin but tough cards about the size of railway tickets, and of different colours for the different denominations – and which would be a stable measure of value as well as a convenient instrument of exchange. And it would have the great advantage of working almost automatically and preserving an unchanged purchasing power by the very act of supplying the demands of the community. And as, with an increasing population, more and more currency would be required, and as many small notes would be lost, burnt, or otherwise destroyed, this currency would be a constant source of revenue to the Government.

During the process of change from metal to paper the gold paid into the Treasury for taxes, duties, stamps, &c., would be accumulated, and form a reserve fund for pressing purchases from other countries in case of war. But the great point is, that by regulating the amount of notes issued in the way above described, this money would become a real

measure of value, which gold can never be so long as its production is a matter of private speculation, and its cost, and consequent value in exchange, liable to indefinite variation.²¹⁹

Wallace's approach found some favor, especially with the prominent American economist Irving Fisher, who dedicated a book on the subject to him some years later.

Wallace on Conservation

The matter of whether Wallace should be considered a proto-conservationist is an interesting one, both because it bears on what may be considered conservation, and because some of his own activities have occasionally raised eyebrows. Certainly if one were to look for "founding fathers" of a type more attuned to today's sensibilities preferential nods might be given to George Perkins Marsh or John Muir, but Wallace's own contributions are interesting on their own merits.

It should perhaps be noted at the outset that some observers have expressed a certain disgust with Wallace's collecting efforts, and it is of course true that during his twelve years in the field he ended the lives of probably two hundred thousand or more creatures, including thousands of birds and, worse yet, some twenty orangutans. But in the 1850s none of these creatures were endangered, and as a collector Wallace was a dispassionate, practical worker, not a romantic figure in a novel. Surely his was not a joy connected to hunting or blood and gore, but to discovery – though here the price of discovery was, unfortunately, the loss of many individual animals.²²⁰

Wallace has also received some criticism for his often bordering-on-despotic views on native life and culture. I think this rather unfair, as there was hardly a single nineteenth century figure who was less racist than Wallace, both with respect to his appreciation of their innate intellectual and moral qualities, and his attitude toward how they might be brought into the modern world. Earlier we looked at some of his writings from the 1860s condemning the poor treatment of native populations, and that he never lost this perspective is evident from the following concluding passages to a late essay of his titled "The Native Problem in South Africa and Elsewhere":

So long as we possess colonies in which a considerable native population still exists we should, I think, always retain our guardianship of those natives in order to protect them from the oppression and cruelty which always occurs when a young, and mainly wealth-seeking community has absolute power over them. Where these natives are numerous and energetic, and are rapidly acquiring our education, our religion, and the outward form at all events of our civilisation, things cannot remain as they are. What the ultimate condition of such mixed communities may be it is difficult to say, but, whatever the future may have in store for us, it is certain that a method which recognises that the coloured races are men of fundamentally the same nature as ourselves, and which aims at

²¹⁹ *The Clarion* 3 December 1898: 389.

²²⁰ What kind of emotions Wallace may have felt while skinning orangutans can only be guessed at, but as to his general constitution I am reminded of a passage from his autobiography describing a guided tour he was given of a meat factory in Sioux City, Iowa, during his North America visit in 1887: "One morning Mr. Talbot took me to see the pork-curing establishment, where, during the season, they kill a thousand hogs a day. . . . The ingenuity of the whole process is undeniable; but to go through it all, as I was obliged to do, along narrow planks and ladders slippery with blood and water, and in the warm, close, reeking atmosphere, was utterly disgusting." *My Life* 1905, vol. 2, pp. 149–150.

developing the best that is in them, by granting them some at least of the elementary rights of men and citizens, is more likely to bring about a satisfactory solution of this difficult problem, than that system of contemptuous superiority and denial of all political and social claims that has hitherto so largely prevailed.

Having no personal knowledge of the country more particularly referred to in this article, I only put forward my views in a suggestive form. Forty years ago I had the privilege of enjoying the friendship of Sir James Brooke, and, during more than a year's residence in Sarawak, of observing the mode and results of his beneficent and sympathetic rule over antagonistic native races. A little later I spent several months in North Celebes, in Java, and in East Sumatra, where I had full opportunity of noticing the effects of the judicious rule of the Dutch, almost wholly exerted through native chieftains. For nearly twelve years I travelled and lived mostly among uncivilised or completely savage races, and I became convinced that they all possessed good qualities, some of them in a very remarkable degree, and that in all the great characteristics of humanity they are wonderfully like ourselves. Some, indeed, among the brown Polynesians especially, are declared by numerous independent and unprejudiced observers, to be both physically, morally, and intellectually our equals, if not our superiors; and it has always seemed to me one of the disgraces of our civilisation that these fine people have not in a single case been protected from contamination by the vices and follies of our more degraded classes, and allowed to develop their own social and political organism under the advice of some of our best and wisest men and the protection of our world-wide power. That would have been indeed a worthy trophy of our civilisation. What we have actually done, and left undone, resulting in the degradation and lingering extermination of so fine a people, is one of the most pathetic of its tragedies.²²¹

These are certainly among the most stirring words Wallace ever wrote, and to think of them merely as a display of despotism rather misses the point. Earlier in the essay Wallace sets out a plan for giving native South Africans some control of their own destinies:

. . . What we have to aim at is, in the first place, to diminish the sense of injustice now felt by the educated and christianised natives, at being treated as a subject and degraded race, despotically ruled by aliens who, for the most part, take no account whatever of their feelings and claims as British subjects and fellow Christians. In the second place, we must proceed tentatively so as not to arouse antagonism in the ruling race, our aim being to give the better and higher among the natives an opportunity of freely stating their political and social grievances, so as to influence the legislature towards a more just and sympathetic treatment of them.

The first and most obvious thing to do is to give to the natives in every district of each Colony one or more chiefs or magistrates of their own race, chosen from the native clergy or schoolmasters or any other adequately qualified individuals. These native magistrates should sit with the ordinary magistrates, and in all cases, criminal or civil, where both natives and Europeans were concerned, would act as the official protector or advocate for the native in the interests of justice, and for the purpose of putting the native point of view before the European magistrate or judge, who would alone be responsible for the decision of the court.

In the case of disputes between or crimes by natives, in which no whites were concerned, the native magistrate would hear and decide the matter according to native law

²²¹ "The Native Problem in South Africa and Elsewhere." *Independent Review* 11, 1906: 174–182, on pp. 181–182.

and custom, but modified where necessary in accordance with European law. Here too the Colonial magistrate would (at first) preside over the court, giving advice and suggestions to the native magistrate; but except in very difficult or important cases would allow the native magistrate to give the judgment of the court.²²²

Wallace was too much of a realist to think that the technologically primitive peoples of the world could resist the organized colonizing forces of the West. He believed that their future was hopeless, at least to the extent of their remaining unaffected by the juggernaut of Western imperialism. He has sometimes been demonized for referring to particular cultures as “lower,” but in so doing he was making a statement about their relative lack of development of complex technology and inability to resist external forces, and not, as we have already seen, about their basic intelligence or morality, or potential.

The question of whether Wallace can be considered a proto-conservationist is tied to whether his activities and writings show much of an interest in human–nature interdependencies, as would a modern conservationist’s. Perhaps they do not, as botanist Sandra Knapp has argued.²²³ Whether this is true or not may be debated, but he certainly did argue from time to time for better understandings of the natural world, and at other times against the depletion of its resources. For an example of the first type of commentary one can turn to one of his Malay Archipelago-related writings. The year after return from the East in 1862 he gave a long presentation on the physical geography of the East Indies. In what has become one of the most quoted passages in the literature of the recent biodiversity studies movement, he ended the talk with the following words:

. . . my object has been to show the important bearing of researches into the natural history of every part of the world upon the study of its past history. An accurate knowledge of any group of birds or of insects, and of their geographical distribution, may assist us to map out the islands and continents of a former epoch; the amount of difference that exists between the animals of adjacent districts being closely dependent upon preceding geological changes. By the collection of such minute facts alone can we hope to fill up a great gap in the past history of the earth as revealed by geology, and obtain some indications of the existence of those ancient lands which now lie buried beneath the ocean, and have left us nothing but these living records of their former existence.

It is for such inquiries the modern naturalist collects his materials; it is for this that he still wants to add to the apparently boundless treasures of our national museums, and will never rest satisfied as long as the native country, the geographical distribution, and the amount of variation of any living thing remains imperfectly known. He looks upon every species of animal and plant now living as the individual letters which go to make up one of the volumes of our earth’s history; and, as a few lost letters may make a sentence unintelligible, so the extinction of the numerous forms of life which the progress of cultivation invariably entails will necessarily render obscure this invaluable record of the past. It is, therefore, an important object, which governments and scientific institutions should immediately take steps to secure, that in all tropical countries colonised by Europeans the most perfect collections possible in every branch of natural history should be made and deposited in national museums, where they may be available for study and interpretation.

²²² *Ibid.*, pp. 178–179.

²²³ Knapp, Sandra, “Wallace, Conservation, and Sustainable Development.” In Charles H. Smith & George Beccaloni, eds., *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace*, Oxford University Press, 2008: 201–220.

If this is not done, future ages will certainly look back upon us as a people so immersed in the pursuit of wealth as to be blind to higher considerations. They will charge us with having culpably allowed the destruction of some of those records of Creation which we had it in our power to preserve; and while professing to regard every living thing as the direct handiwork and best evidence of a Creator, yet, with a strange inconsistency, seeing many of them perish irrecoverably from the face of the earth, uncared for and unknown.²²⁴

Beyond making pleas for continued discovery, moreover, Wallace was quick to point out particular circumstances of environmental degradation. In 1878 he wrote:

. . . Whether we are at Singapore or Batavia; in the Moluccas, or New Guinea; at Para, at the sources of the Rio Negro, or on the Upper Amazon, the equatorial climate is essentially the same, and we have no reason to believe that it materially differs in Guinea or the Congo. In certain localities, however, a more contrasted wet and dry season prevails, with a somewhat greater range of the thermometer. This is generally associated with a sandy soil, and a less dense forest, or with an open and more cultivated country. The open sandy country with scattered trees and shrubs or occasional thickets, which is found at Santarem and Monte-Alegre on the lower Amazon, are examples, as well as the open cultivated plains of Southern Celebes; but in both cases the forest country in adjacent districts has a moister and more uniform climate, so that it seems probable that the nature of the soil or the artificial clearing away of the forests, are important agents in producing the departure from the typical equatorial climate observed in such districts. The almost rainless district of Ceara on the North-East coast of Brazil and only a few degrees south of the equator, is a striking example of the need of vegetation to react on the rainfall. We have here no apparent cause but the sandy soil and bare hills, which when heated by the equatorial sun produce ascending currents of warm air and thus prevent the condensation of the atmospheric vapour, to account for such an anomaly; and there is probably no district where judicious planting would produce such striking and beneficial effects. In Central India the scanty and intermittent rainfall, with its fearful accompaniment of famine, is no doubt in great part due to the absence of a sufficient proportion of forest-covering to the earth's surface; and it is to a systematic planting of all the hill tops, elevated ridges, and higher slopes that we can alone look for a radical cure of the evil. This would almost certainly induce an increased rainfall; but even more important and more certain, is the action of forests in checking evaporation from the soil and causing perennial springs to flow, which may be collected in vast storage tanks and will serve to fertilise a great extent of country; whereas tanks without regular rainfall or permanent springs to supply them are worthless. In the colder parts of the temperate zones, the absence of forests is not so much felt, because the hills and uplands are naturally clothed with a thick coating of turf which absorbs moisture and does not become over-heated by the sun's rays, and the rains are seldom violent enough to strip this protective covering from the surface. In tropical and even in south-temperate countries, on the other hand, the rains are periodical and often of excessive violence for a short period; and when the forests are cleared away the torrents of rain soon strip off the vegetable soil, and thus destroy in a few years the fertility which has been the growth of many centuries. The bare subsoil becoming heated by the sun, every particle of moisture which does not flow off is evaporated, and this again reacts on the climate, producing long-continued droughts only relieved by sudden and violent storms, which add to the destruction and render all attempts at cultivation unavailing. Wide tracts of fertile land in the south of Europe have been devastated in this manner, and have become absolutely uninhabitable. Knowingly to produce such disastrous results would be

²²⁴ "On the Physical Geography of the Malay Archipelago." *Journal of the Royal Geographical Society* 33, 1863: 217–234, on pp. 233–234.

a far more serious offence than any destruction of property which human labour has produced and can replace; yet we ignorantly allow such extensive clearings for coffee cultivation in India and Ceylon, as to cause destruction of much fertile soil which generations cannot replace, and which will surely, if not checked in time, lead to the deterioration of the climate and the permanent impoverishment of the country. (For a terrible picture of the irreparable devastation caused by the reckless clearing of forests see the third chapter of Mr. Marsh's work *The Earth as Modified by Human Action*.) . . .²²⁵

In 1903, in a chapter on meteorology from *Man's Place in the Universe*, he wrote on air pollution:

. . . We thus find that the vast, invisible ocean of air in which we live, and which is so important to us that deprivation of it for a few minutes is destructive of life, produces also many other beneficial effects of which we usually take little account, except at times when storm or tempest, or excessive heat or cold, remind us how delicate is the balance of conditions on which our comfort, and even our lives, depend.

But the sketch I have here attempted to give of its varied functions shows us that it is really a most complex structure, a wonderful piece of machinery, as it were, which in its various component gases, its actions and reactions upon the water and the land, its production of electrical discharges, and its furnishing the elements from which the whole fabric of organic life is composed and perpetually renewed, may be truly considered to be the very source and foundation of life itself. This is seen, not only in the fact of our absolute dependence upon it every minute of our lives, but in the terrible effects produced by even a slight degree of impurity in this vital element. Yet it is among those nations that claim to be the most civilised, those that profess to be guided by a knowledge of the laws of nature, those that most glory in the advance of science, that we find the greatest apathy, the greatest recklessness, in continually rendering impure this all-important necessary of life, to such a degree that the health of the larger portion of their populations is injured and their vitality lowered, by conditions which compel them to breathe more or less foul and impure air for the greater part of their lives. The huge and ever-increasing cities, the vast manufacturing towns belching forth smoke and poisonous gases, with the crowded dwellings, where millions are forced to live under the most terrible insanitary conditions, are the witnesses to this criminal apathy, this incredible recklessness and inhumanity.

For the last fifty years and more the inevitable results of such conditions have been fully known; yet to this day nothing of importance *has* been done, nothing *is* being done. In this beautiful land there is ample space and a superabundance of pure air for every individual. Yet our wealthy and our learned classes, our rulers and law-makers, our religious teachers and our men of science, all alike devote their lives and energies to anything or everything but this. Yet *this* is the one great and primary essential of a people's health and well-being, to which *everything* should, for the time, be subordinate. Till this is done, and done thoroughly and completely, our civilisation is naught, our science is naught, our religion is naught, and our politics are less than naught – are utterly despicable; are below contempt.

It has been the consideration of our wonderful atmosphere in its various relations to human life, and to all life, which has compelled me to this cry for the children and for outraged humanity. Will no body of humane men and women band themselves together, and take no rest till this crying evil is abolished, and with it nine-tenths of all the other evils that now afflict us? Let *everything* give way to this. As in a war of conquest or aggression

²²⁵ *Tropical Nature and Other Essays* (Macmillan, 1878), pp. 18–21.

nothing is allowed to stand in the way of victory, and all private rights are subordinated to the alleged public weal, so, in this war against filth, disease, and misery let nothing stand in the way – neither private interests nor vested rights – and we shall certainly conquer. This is the gospel that should be preached, in season and out of season, till the nation listens and is convinced. Let this be our claim: Pure air and pure water for every inhabitant of the British Isles. Vote for no one who says “It can’t be done.” Vote only for those who declare “It shall be done.” It may take five or ten or twenty years, but all petty ameliorations, all piecemeal reforms, must wait till this fundamental reform is effected. Then, when we have enabled our people to breathe pure air, and drink pure water, and live upon simple food, and work and play and rest under healthy conditions, they will be in a position to decide (for the first time) what other reforms are really needed.

Remember! We claim to be a people of high civilisation, of advanced science, of great humanity, of enormous wealth! For very shame do not let us say “We *cannot* arrange matters so that our people may all breathe unpolluted, unpoisoned air!” . . .²²⁶

Obviously, Wallace was not above trying to shame people into seeing reason. In 1910 he wrote:

. . . Already in the progress of this work I have dwelt upon the marvellous *variety* of the useful or beautiful products of the vegetable and animal kingdoms far beyond their own uses, as indicating a development for the service of man. This variety and beauty, even the strangeness, the ugliness, and the unexpectedness we find everywhere in nature, are, and therefore were intended to be, an important factor in our mental development; for they excite in us admiration, wonder, and curiosity – the three emotions which stimulate first our attention, then our determination to learn the how and the why, which are the basis of observation and experiment and therefore of all science and all philosophy. These considerations should lead us to look upon all the works of nature, animate or inanimate, as invested with a certain sanctity, to be *used* by us but not *abused*, and never to be recklessly destroyed or defaced. To pollute a spring or a river, to exterminate a bird or beast, should be treated as moral offences and as social crimes; while all who profess religion or sincerely *believe* in the Deity – the designer and maker of this world and of every living thing – should, one would have thought, have placed *this* among the first of their forbidden sins, since to deface or destroy that which has been brought into existence for the use and enjoyment, the education and elevation of the human race, is a direct denial of the wisdom and goodness of the Creator, about which they so loudly and persistently prate and preach.

Yet during the past century, which has seen those great advances in the *knowledge* of Nature of which we are so proud, there has been no corresponding development of a love or reverence for her works; so that never before has there been such widespread ravage of the earth's surface by destruction of native vegetation and with it of much animal life, and such wholesale defacement of the earth by mineral workings and by pouring into our streams and rivers the refuse of manufactories and of cities; and this has been done by all the greatest nations claiming the first place for civilisation and religion! And what is worse, the greater part of this waste and devastation has been and is being carried on, *not* for any good or worthy purpose, but in the interest of personal greed and avarice; so that in every case, while wealth has increased in the hands of the few, millions are still living without the bare necessities for a healthy or a decent life, thousands dying yearly of actual starvation, and other thousands being slowly or suddenly destroyed by hideous diseases or accidents, directly caused in this cruel race for wealth, and in almost every case easily preventable.

²²⁶ *Man's Place in the Universe* (Chapman & Hall, 1903), pp. 254–257.

Yet they are *not* prevented, solely because to do so would somewhat diminish the profits of the capitalists and legislators who are directly responsible for this almost world-wide defacement and destruction, and virtual massacre of the ignorant and defenceless workers.

The nineteenth century saw the rise, the development, and the culmination of these crimes against God and man. Let us hope that the twentieth century will see the rise of a truer religion, a purer Christianity; that the conscience of our rulers will no longer permit a single man, woman, or child to have its life shortened or destroyed by any preventable cause, however profitable the present system may be to their employers; that no one shall be allowed to accumulate wealth by the labour of others unless and until every labourer shall have received sufficient, not only for a bare subsistence, but for all the reasonable *comforts* and *enjoyments* of life, including ample recreation and provision for a restful and happy old age. . . .²²⁷

I think that Wallace can legitimately be considered a “proto-conservationist,” if not necessarily in terms of efforts made for particular causes, then in his attempts to make us think about the implications of our actions.

Coda

In this series of essays I have endeavored to give the reader some idea of the span of Wallace’s interests, and a feeling both for his accomplishments and the kinds of questions that remain about his work. I regret that more of a biographical nature could not be included here, as his was a life that was not only well-lived, but interesting in detail. Further, his is an inspiring story both of individual bravery (imagine yourself traipsing around alone, or nearly so, for twelve years in the primitive wilds of the tropics of the mid-nineteenth century!) and dedication not only to scientific discovery, but to societal improvement. Wallace is such a rich subject that the definitive Wallace biography has yet to be written (though several very good ones were suggested in the Introduction), but we may hope in the future to keep filling in the gaps.

For all the interest there is in Wallace’s life, however, in the end it is his thought that most absorbs. For many years he was treated as something of an eccentric, the opinion being that his forays into social criticism and spiritualism were indicative of inconsistency. On closer examination, however, many of the “inconsistencies” just look more like the tracings of a wonderfully diverse intellect, one that was willing to stick to its own conclusions, regardless of criticism. While no one would argue that *all* of his conclusions were both brilliantly conceived and dead on-spot (it is doubtful that his support of phrenology will ever come to anything, for example), continued examination of his ideas is bound to produce continued rewards.

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²²⁷ *The World of Life* (Chapman & Hall, 1910), pp. 278–280.