

No Man Is an Island

There is something magical, irrationally intriguing, about islands. Indeed any land mass surrounded by water—whether verdant or barren, historically fascinating or bereft of meaningful history—beguiles continent-based observers who often endow the island with fanciful attributes.

Islands are sanctuaries of imagination. Somehow, in the creative fancy of those who dwell on land surrounded solely by still more land, an island becomes the site of mystery, the incubator of creativity, and for the romantically-inclined, a crucible for renewed youth and bliss. Shakespeare, for one of his last plays, foreswore the Italian peninsula and the dirty streets of London and based the dramatic action of *The Tempest* upon a mythical island.

Then, of course, there are celebrated islands such as Capri, Crete, Samoa, Pitcairn, Elba, St. Helena, Ellis, Monte Cristo, Ceylon and even, perhaps, Alcatraz: each evokes passions ranging from the ecstatic to the grim but rarely the mundane.

Consider two islands, one in the eastern Pacific Ocean, the other in the East Indies; each part of larger archipelagoes and each famous as the site of fundamental advances in the framework of evolutionary biology.

The first is Isla Isabela, the major landmass of the Galapagos, some 600 miles west of South America and virtually astride upon the Equator. Charles Darwin (1809 – 1882) explored the flora and fauna of these semi-desert islands and later used the variation in the shapes of the beaks of the local finches as evidence for his evolving theory of natural selection underlying the origin of species.

The second of these islands is tiny Ternate, a land mass of about 27 square miles dominated by an active volcano called Mount Gamalama, situated in the eastern Molucca archipelago of Indonesia. Alfred Russel Wallace (1822 – 1913), born in Monmouthshire, Wales, developed skills, as a youth, in land-surveying and field biology. Over the years, he became England's leading bio-geographer, explorer, social activist, field zoologist and proponent of Darwin's theory of evolution. The socially-conscious writers Thomas Malthus, Robert Owen, Thomas Paine and John Stuart Mill influenced the young Wallace who spent much of his productive life both in extensive exploration of the Amazon basin, the Malay Peninsula and neighboring Indonesian islands and in the advocacy of occasionally unpopular views such as women's right to vote.

While charting the numbers and geographic distribution of feral animals on Ternate in 1858, Wallace developed malaria requiring extended bedrest. During this recovery-interval his many observations on animal life coalesced into a theory that culminated in a broad overview of life, both botanical and zoological, as an unremitting struggle for survival such that the more fit within each species survived and furnished their hereditary material for the next generation more than the less fit, akin to some of Malthus's views on human population growth. Wallace however, went a critical step further, declaring that this struggle for survival favored variant offspring with attributes

more uniquely suited for the random changes in the environment; and that the cumulative effects of these physical variations—generation by generation—would lead eventually to the creation of new species more adaptable to the new environment. This radical view, of course, was contrary to the prevailing belief that all species were permanently and divinely fixed, immutable in physical characteristics and subject neither to extinction on the one hand nor transformation into a new species on the other hand. In Wallace's words: "The problem then was not only how and why do species change, but how and why do they change into new and well defined species, distinguished from each other in so many ways; why and how they become so exactly adapted to distinct modes of life."

Wallace, 13 years younger than Darwin, summarized his beliefs, based on years of data-collection, and in February, 1858, sent his manuscript off to Charles Darwin in England. The manuscript ("On The Tendency of Varieties to Depart Indefinitely From the Original Type") arrived in June 1858. And while Wallace's paper did not employ the phrase "natural selection" it did nonetheless parallel Darwin's slowly evolving hypothesis that as environments change and as food supplies wax and wane, a struggle for existence ensues and evolutionary divergence is the consequence.

Darwin was so impressed with Wallace's conjectures that he arranged to have Wallace's paper—along with his own—presented before the Linnaean Society of London on July 1, 1858. Wallace was still working in the East Indies; only months later did he learn that Darwin had honored him as the co-discoverer of the theory of natural selection.

In the following decades, Wallace wrote a number of seminal texts including the "The Malay Archipelago" (1869), to this day the leading text on Malaysian ecology; "The Geographic Distribution of Animals" (1876); and in 1880, his great text, "Island Life," was finally published. In this illuminating book Wallace demonstrated that islands which arose in mid-ocean, usually from volcanic activity, but permanently separated from the continents, completely lacked both amphibians and terrestrial mammals. Islands that had once been connected to a continent such as Britain had a more versatile flora and fauna, but because of environmental conditions unique to the island developed variants of these mainland species.

Wallace survived until age 90, using his terminal years to warn the world about the hazards of deforestation and industrial pollution.

– STANLEY M. ARONSON, MD

Disclosure of Financial Interests

Stanley M. Aronson, MD, has no financial interests to disclose.

CORRESPONDENCE

e-mail: SMAMD@cox.net