

MacArthur R H & Wilson E O. *The theory of island biogeography*. Princeton, NJ: Princeton University Press, 1967. 203 p.
[Department of Biology, Princeton University, NJ and Department of Biology, Harvard University, Cambridge, MA]

The Theory of Island Biogeography establishes the conditions for the attainment and maintenance of equilibrium species numbers on islands and fragmented habitats. It employs mathematical models to estimate rates of colonization and turnover, as well as differences in species diversity among islands. [The SC¹® indicates that this book has been cited in over 1,830 publications.]

E.O. Wilson
Museum of Comparative Zoology
Harvard University
Cambridge, MA 02138

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In 1960 Robert H. MacArthur and I began a series of meetings in a self-conscious attempt to make an important contribution to biogeography. The youthful discipline of population biology was in ferment, and opportunities for theoretical advance seemed to be everywhere. In particular, mathematical models posed an entrée into complex topics of ecology and behavior previously treated in a primarily descriptive manner. We saw that models of demography and evolution by natural selection were newly available to link processes at the individual and population levels to processes at the levels of species communities and societies. We were convinced that this approach could have an important impact on ecology, as well as on other disciplines now loosely grouped under evolutionary biology.

Despite his youth—30 at the time—MacArthur was the clear leader in the quantitative ecology movement. His run was to be brief, ending when he died of cancer at the age of 42 in 1972. I was attracted to MacArthur not only by his brilliance and imagination, conveyed through a warm and generous personality, but also by his love of natural history. For my part, I brought to the collaboration a passion for speciation and biogeography and considerable practical experience in those subjects, obtained in the field and in museums. I had already produced the idea of the taxon cycle, in which species groups (clades) pass through episodes of dispersal as they specialize on ecologically marginal hab-

itats and then move to episodes of speciation accompanied by the penetration of central, species-rich habitats.

I persuaded MacArthur that biogeography was ripe for the more analytic, deductive approach. I pointed out to him the first area-species curves, one of which I had worked out with ants in the Pacific Islands. Very roughly, a 10-fold increase in area going from one island to the next results in a doubling of the number of species, at least within a single group of organisms such as birds, reptiles, or ants. From my taxon cycle work at the species level and from earlier studies by P.J. Darlington and G.C. Simpson at the family level in vertebrates, it appeared that faunas are in balance—"saturated" was the word we used most commonly at first. MacArthur responded by producing a simple but powerful model in which equilibrium is attained when the extinction curve (number of species going extinct per unit time as a function of number of species already present on the island) rises enough to cross the falling immigration curve (number of new species arriving per unit time). Once this conception was in place, it was possible to relate the colonization process to more precise statements about the dispersal of organisms, as well as to the growth and extinction of populations.

The formulation was first presented in an article in 1963.¹ Later, when we had time to explore more of its ramifications, we presented it in a much fuller monograph, *The Theory of Island Biogeography*, which incidentally was the first of the Princeton Monographs in Population Biology.

The approach was successful for two reasons. First, it suggested experiments and field studies that could test the idea of equilibrium, measure turnover rates, and in general place colonization and extinction into a new and more interesting context. Second, human activity is fragmenting natural habitats everywhere into island-like systems. The results from island biogeographic theory are therefore basic to conservation planning.

Among the recent summaries of island biogeography and its ramifications in ecology and conservation may be cited books by O.H. Frankel and M.E. Soulé,² M. Williamson,³ and me.⁴

1 MacArthur R H & Wilson E O. An equilibrium theory of insular zoogeography *Evolution* 17:373-87, 1963 (Cited 305 times.)

2 Frankel O H & Soulé M E. *Conservation and evolution* Sunderland, MA: Sinauer, 1981 327 p. (Cited 95 times.)

3 Williamson M. *Island population* New York Oxford University Press, 1981 286 p. (Cited 75 times.)

4 Wilson E O, ed. *Biodiversity*. Washington, DC US National Academy Press, 1988 521 p