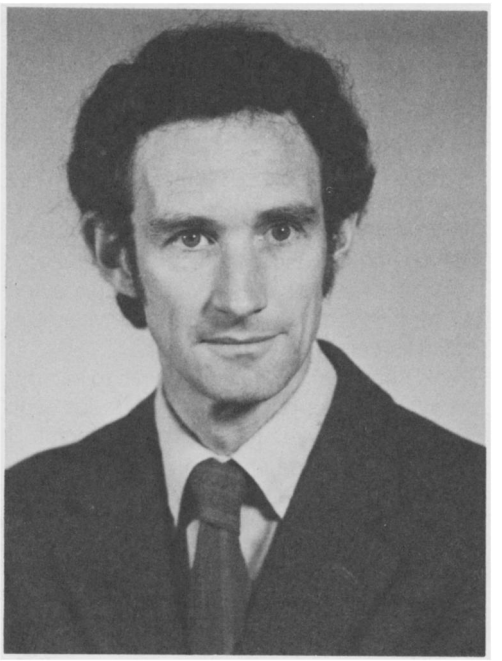
Robert M. May

Robert H. MacArthur was the inspiration for a whole generation of ecologists eager to embrace his view that ecology could and should be given a powerful theoretical basis. When MacArthur died tragically and prematurely in 1972, Robert M. May not only filled MacArthur's position at Princeton, but also rapidly took theoretical ecology far along the track that MacArthur first signposted towards an understanding of the important processes shaping natural communities. It is therefore most appropriate that Bob May should now be honored with the second MacArthur Award.

During the late 1950's and 1960's, while MacArthur was at his most productive, Bob May shot rapidly to stardom as a theoretical physicist. From a position as Assistant Professor in Applied Mathematics at Harvard, 1959 to 1961, he returned to Sydney University, his alma mater, where in 1969 at the age of 33 he was appointed to the first "Personal Chair" created at Sydney, for individuals of "great distinction for whom no vacant Chair exists." Thereafter, his career changed even more rapidly. A growing interest in environmental problems, fostered by discussion with Charles Birch, prompted him to take the opportunity of a sabbatical year at the Plasma Physics Laboratory at Culham in 1971 to visit several ecologists in England, and to meet



Robert MacArthur in Princeton. This resulted in a strong bond of friendship between the two, and in the following year Bob stayed at the Institute of Advanced Study at Princeton, where they jointly prepared their now classic paper on "Niche overlap as a function of environmental variability." But it was not until

the following year, in succeeding MacArthur as the Class of 1877 Professor of Zoology at Princeton, that Bob finally turned his back on physics to become a professional ecologist. Yet even before this he had already completed one of the classic ecology texts of our time. His Princeton Monograph "Stability and Complexity in Model Ecosystems" roams across population dynamics and community ecology, and lays the ground for much of the work on theoretical ecology that has followed since. His treatment of "stability versus complexity in multispecies models" unmuddied the waters to emphasize how, as a mathematical generality, increased multispecies trophic complexity makes for *lowered* stability. If complex systems do prove to be more stable than their simpler counterparts, then the explanation for this must lie outside the often-held notion that "complexity begets stability."

Since settling at Princeton, Bob has brought his characteristic energy and enthusiasm to bear on promoting ecology by his teaching and involvement in the scientific administration of the subject. Despite this his research productivity has been enormous, and he is now honored as having had the major influence in developing theoretical ecology over the past decade or so. In 1979 he was elected Fellow of the Royal Society, for which his citation reads "distinguished for his many contributions to theoretical ecology, including especially the concept of chaos and the clarification of the relations between stability and complexity."

This concept of "chaos" applied to ecological systems has posed a challenge for ecologists that has yet to be properly faced. If simple, nonlinear phenomena in ecology can produce quite erratic, "chaotic" population fluctuations, how can these be distinguished from the irregular patterns arising from the chance effects of climate and other factors? This question is becoming increasingly topical as ecologists are continuing to debate one of the central issues in ecology: to what extent are populations regulated around an equilibrium level? Are there factors promoting the persistence of populations about such equilibria and others primarily determining the detailed patterns of fluctuation? Or are both population persistence and fluctuation inextricably related? Bob is actively involved in this debate, more as a thoughtful mediator than a strident participant. He firmly believes that many a seemingly entrenched position could become just a slightly different perspective if the effort were made to discuss and exchange ideas more openly.

Throughout his work, whether on competition theory, trophic structure, predator-prey and parasitoid-host interactions, harvesting theory, or the dynamics of infectious diseases, Bob's hallmark is clear. The essential problems and their implications are perceived free from obfuscating detail, analytical models are developed with the sole aim of extracting general principles, and the work is presented so that the general conclusions stand out, uncluttered by mathematical detail. Bob has always been eager to work with other ecologists who have a wide range of interests, the most enduring of these collaborations being with the group at Imperial College, London, where he has been a Visiting Professor since 1975. These truly mutualistic interactions have led to lasting friendships and have served further to extend his influence on the development of theoretical and experimental ecology.

Besides his pioneering research, Bob May is known throughout the world for his many delightful contributions to the "News and Views" in *Nature.* These trenchant cameos on topics as diverse as the "Ecology of human parasites," "Kelp, abalone and sea otters," "The Ecology of dragons," "Elephants in Uganda," "Caves as islands," "Clutch size in plants," and "Patterns of ungulate reproduction," have been much more than summaries of recent work. Each one is interpreted in a broad setting and together they have kept a large readership abreast of current developments in ecology. The ecological community owes a great deal to Robert May, and it is most fitting that the Ecological Society of America has recognized his many contributions with this Award.

Written by M. P. Hassell
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