

REGULATION OF PARASITE POPULATIONS. *Academic Press Rapid Manuscript Reproduction.*

Edited by Gerald W. Esch, with Introductory Remarks by Brent B. Nickol. *Academic Press, New York.* \$13.00. xi + 253 p.; ill.; index. 1977.

This book consists of the five papers that were presented in 1975 at a symposium to integrate ecology and parasitology. "Regulation" refers to the density-dependent, negative feedback that controls population size in parasites. The parasites discussed are primarily worms. There is no reference to viral, vertebrate, or plant parasites and only passing mention of microbial parasites. A parasitic population is characterized as an infrapopulation (all individuals of a single parasite species within an individual host) or as a suprapopulation (all individuals of a given parasite species, in all stages of development, within all hosts or in transit among them).

G. W. Esch, T. C. Hazen, and J. M. Aho review physiological, morphological, and developmental factors affecting the regulation of parasite infrapopulations. They conclude that parasites are more *r*-selected than *K*-selected. C. R. Kennedy finds that little information on infrapopulations of fish parasites is good enough to demonstrate regulation. He reviews two cases where there is evidence for regulation. G. A. Schad describes the environmental, parasitic, and host factors which induce arrested development in nematode infrapopulations and the multiple consequences of arrested development. This paper is rich in coherently arranged, interesting facts which need interpretation in terms of ecological theory. R. P. Hirsch reviews some mathematical models in parasitology. In the book's only major re-

port of new work, J. C. Holmes, R. Hobbs, and T. S. Leong suggest that the regulation of infrapopulations of the acanthocephalan *Matechinorhynchus salmonis* in lake whitefish suffices to regulate the suprapopulation of *M. salmonis* in all 10 of its fish hosts in a Canadian lake, even though there may be no density-dependent control of the parasite in the other 9 species.

Themes which recur in these papers are the non-random dispersal of parasites among hosts, the variety of mechanisms which can regulate parasite infrapopulations, and, as pointed out in B. B. Nickol's introduction, the complementary nature of field work, laboratory studies, and mathematical modeling.

Some bits of ecological theory used here, including the distinction between *r*- and *K*-selection and some of the mathematical modeling, may deserve more or less confidence. But there are enough fascinating tales and riddles of parasitic biology to make the book worth reading by a broad spectrum of biologists. Parasitic biology and, ultimately, food production stand only to benefit from more turbulent interaction with two of the great intellectual streams of modern biology, population biology and molecular biology. These streams, in turn, can only be enriched by the complex and urgent problems of parasitology.

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