success, but, with a much larger sample, a small but significant effect emerged: farmland birds did less well and lived at a lower density than those in the wood. A year later, S. D. Fretwell and H. L. Lucas, Jr. (1970) published their theoretical work on habitat selection in which they introduced the idea of an "Ideal Free Distribution." Had I been testing their ideas, I would have been pleased to stop after collecting my first small sample of data, which showed that the birds in the two habitats were doing equally well. To collect a small amount of data and stop is not the best way to test an ideal free distribution. A more stringent test might be to look for frequency-dependent responses to perturbations from the supposed equilibrium.

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Welcome Mathematicians

John T. Emlen[1]

Most ornithologists are naturalists and, like other naturalists, have for centuries been pursuing their studies in the field, the stage on which the drama of the living world takes place. Their primary aim from the start has been to record faithfully the events that they observed, and for each event the setting and the circumstances as best they could read them; they have, thus, first sought to answer the what, when, and where questions posed by the world of nature. But naturalists have by no means ignored the how and why questions that the human intellect incessantly raises; it is to them, in fact, that the modern world owes many of its greatest unifying concepts, including the theory of evolution by natural selection.

Meanwhile, at their desks in our institutions of higher learning, mathematicians have been combining and manipulating figures and abstractions in search of the nature of systems underlying the order we see in the universe. To most naturalists the objectives and methods of these closeted intellectuals have seemed remote and only vaguely relevant. Then, suddenly, mainly in the past two decades, mathematicians searching for applications of their art descended on the naturalist's domain

[1] Department of Zoology, University of Wisconsin, Madison, Wisconsin 53706 USA.

with challenging new ideas on how field research should be conducted and even on how nature in all its subtle forms and moods should be interpreted.

Not surprisingly, the reception accorded these invaders has not been uniformly cordial. To some naturalists, mathematicians are inherently dreamers, ignorant of the real world of living things, imposters skimming the cream from hard-earned data banks and usurping costly pages in cherished journals. But others remember that, as recently as the 1940's and 1950's, forward-looking naturalists were bemoaning the inadequacy of available theory to handle their massive accumulations of recorded observation. Other branches of science, bolstered by rapid advances in deductive research techniques, statistical procedures, and computer technology, had forged ahead, while natural history, bogged down in the overwhelming complexity of its subject matter, was clinging largely to the reliable but slow formulae of direct description and inductive interpretation. Today, as ornithology and its sister disciplines in natural history find themselves again at the forefront of a surge of exciting new scientific developments, ornithologists must ask themselves: would we be here if the mathematicians had not so rudely disturbed our tranquility a few decades ago?

Any rapid change in the structure and balance of a scientific discipline is likely to create problems and pose dangers. I see three major dangers to ornithology in the sudden ascendency of mathematical theory in our programs and activities:

First, the enthusiasm for theoretical approaches could swing the pendulum too far and create a new imbalance opposite to the one that plagued us in the 1940's and 1950's. Hypotheses, to be effective in their function of pointing the way, require constant access to rich sources of accurate observation. To allow these sources to dry up or fall behind could be disastrous. The responsibility rests heavily on our editors and program committees to see that a healthy balance of theory and descriptive material is maintained among and within the papers accepted for our journals and scientific programs.

Second, the demands of statistical and machine analysis for large data samples involve categorizations and associated compromises with accuracy that theorists do not always appreciate and that naturalists must accept with awareness and caution. There is no substitute in observational procedure for the anecdotal accounts of naturalists so often scorned by myopic laboratory scientists whose experience goes no farther than the grossly oversimplified and narrowly categorized environments of their laboratories.

Third, the acquisition of new mathematical approaches and procedures must not be allowed to inhibit the free communication that has sustained ornithology as a unified discipline over the years. We have, of course, diversified and expanded into many subdisciplines without losing our unity, but developments in approach, as opposed to content, are potentially divisive and could lead to schisms like those that have split some of our sister disciplines into theorist and experimentalist branches, each with its separate meetings and specialized journals. To counter any such trends, ornithologists in the naturalist's tradition must make concerted efforts to grasp the essentials of the mathematical approach, while the mathematically oriented must deliberately move to participate actively in one or more aspects of field research.