population was dependent on those individuals for work and sustenance. The ultimate result of this social stratification was a class of very rich individuals and a massive class of very poor ones.

According to Manning, one consequence of the monoculture approach (the production of a limited number of crop products) in providing sustenance to the population as a whole has been the progressive rise of malnutrition of the poor within societies. As agriculture developed, the poor were no longer reliant only on themselves to provide for their needs and, instead, depended on the wealthier societal members to determine their allotment. This situation, of course, resulted in the poor being provided with what was cheapest (such as potatoes or wheat, rather than meat), which did not usually constitute a well-balanced diet of high-quality fare.

The development of agriculture also translated into a great increase in both population size and density. Unfortunately, these increases led to negative impacts on the population. Increased population density inevitablyleads to an increase in disease incidence, often in naïve populations with no immunity to disease. An unfortunate example of this type of casualty was the decimation of Native Americans by smallpox. Similar consequences occurred as hunter-gatherers made the transition to an agricultural society.

Another factor that the author states has contributed to the development of malnutrition and disease is the prevalence of famine in agricultural societies. As previously stated, the development of agriculture leads to an increase in population. Often, human populations then reach unsustainable levels, where they are impacted by famine in years with decreased amounts of crops. If a society is dependent on only a few crops for sustenance, failure of one of those crops can equal starvation and devastation for the population. Starvation then results in malnutrition, disease, and death.

Environmental impacts of agriculture have far-reaching effects. Nitrogen excess from agricultural fertilization causes biological dead zones in waterways with low oxygen tension and poor nutrient quality. A major current example of a dead zone is a huge area in the Gulf of Mexico that sustains no aquatic life as a direct result of farm nutrients of the Midwestern United States running off the Mississippi watershed. Another major consequence of agriculture is erosion of the land, which was evident in the Dust Bowl of Oklahoma during the 1930s.

Increased population size that results from agricultural development directly correlates to an increased need for space and need for increased resources. Expansion of the population area inevitably occurs until there is no further room to expand. During the 20th Century, the capacity of the land to produce crops, combined with the limited amount of space available, resulted in a situation where something had to give if the population was to be sustained.

In the mid-1960s, the Green Revolution occurred as a response to this demand. Because the area of land could not be expanded, the yield per unit area of land had to increase. The term "Green Revolution" was adopted to refer to the development of methods to increase crop yields. Although the Green Revolution may have solved some problems, it created many of its own. These more modern crops require increased fertilizer, which, along with pesticides, causes increased environmental contamination. Also, the soil is increasingly depleted of its nutrients at a faster, exponential rate, leading to irreparable damage and loss of long-term sustainability of the land.

A more modern social impact of agriculture centers around the high profits enjoyed by the product middlemen, such as food processors, who purchase crops from farmers and sell to consumers. A vast economic inequality between the farmer and agribusiness corporations has developed, such that many farmers struggle to survive from year to year while corporations maintain lucrative enterprises.

Although Manning clearly does not approve of agricultural practices, he does concede the necessity of agriculture in modern society as a compromise between the belief that agriculture causes negative impacts on society and the inevitability that the current population must depend on some form of agriculture to survive. Manning endorses the methods of organic farming. Through organic farming, Manning hopes to eliminate wealthy middlemen and bring profitability back to the farmer. Also, organic farming has less impact on the environment, due to its decreased intensity of farming, its increased diversity of crops, and its reduced use of fertilizer.

The main purpose behind this book is to give us, as a society, insight into the problems with our agriculturally based lives rather than necessarily presenting viable solutions for these problems. Although many of Manning's theories are based on general (and disputable) assumptions, they are still relevant to understanding problems that have hounded us since the birth of agriculture and even more intensely since the development of industrial agriculture. Through discussion of the history and development of agriculture, Manning allows the reader to understand and consider his theories. His concluding suggestion to apply organic farming as a solution for many of the problems that we face is not necessarily feasible on a large scale, but such farming may provide some methods to apply to large-scale farming to decrease the negative impacts of traditional agriculture. In any case, Manning has presented some vital issues concerning agriculture that need to be considered if we plan to sustain ourselves as a society.—*Devon Thrasher,* Washington State University, Pullman, WA.

Stochastic Modeling in Range Management: Selected Essays. By Amitrajeet A. Batabyal, with other text contributors. 2004. NOVA Science Publishers, Inc., Hauppauge, NY. 120 p. US$69.00 hardbound. ISBN 1-59033-844-8.

In 1956, Bloom's taxonomy of cognitive levels was first published. The authors presented 6 levels of cognitive learning. These included knowledge, comprehension, application, analysis, synthesis, and evaluation. Interestingly, each of the natural sciences has had to move through these various cognitive stages to mature as a science. The science of rangeland management is no different. The concept of moving range management beyond the elementary cognitive levels of knowledge, comprehension, and application has been captured by Dr. Amitrajeet A. Batabyal in his book, *Stochastic Modeling in Range Management: Selected Essays.*

This book combines well-defined principles of range management and some elegantly sophisticated mathematics to discuss several current issues in range management. The book is a combination of some new and some reprinted essays. The central claim of this book is developed around three points. First, to a great extent, a theoretical approach has not been applied to range management. Second, most research has treated range management as a purely ecological problem, when it should, in fact, be considered an ecological-economic system. Third, range management is dependent on decision making under uncertainty and very little work has been done to model uncertainty in these systems. To address these three concerns, several essays have been compiled to show how stochastic modeling can be applied to effectively model rangelands.

If one undertakes a rudimentary scan of the book, the mathematics may look somewhat daunting. In addition, the authors tend to use a good deal of mathematical jargon. However, the book is highly readable aside from the mathematics. Several of the issues managers must deal with daily are tackled within the book. For example, the authors provide information for selecting the optimal number of paddocks, determining the proper timing and duration of grazing, evaluating the steady-state distribution of animals, and managing to avoid potential crisis states.

Mathematics is subsequently provided to discuss issues arising from these four issues. Many of the algorithms developed and discussed are based on various forms of the transition probability matrix, so some experience with them and other forms of probability analysis will assist the reader in understanding the formulations. To understand the essays in depth and to gain a total appreciation of the authors' approach, the reader would do well to have some training in mathematics, particularly calculus and mathematical statistics. Aside from this pitfall, the authors do include a generous introduction to each essay and they present strong concluding remarks to provide a framework for applying each theory.

This book is not for everyone, but for those who desire to help develop the theoretical basis for rangeland management, the book is necessary. Although the book uses short-duration grazing systems as the model system, other patterns of grazing can be derived from the information provided by the authors. The science of range management is constantly changing. For continued progress to be made in range management, the traditional ecological model must be enhanced. As a science, we need to consider the theoretical expression of our work. We must move beyond measuring and reporting to analysis, synthesis, and evaluation of our research and ultimately to the development of a theory for range management. Dr. Batabyal has hit on a potential stepping stone to developing such a theoretical basis for range management.—*Dr. Jon D. Hanson,* USDA-ARS, Northern Great Plains Research Laboratory, Mandan, ND.

The Exotic Amphibians and Reptiles of Florida. By Walter E. Meshaka, Jr., Brian P. Butterfield, and J. Brian Hauge. 2004. Krieger Publishing Co., Malabar, FL. 155 p. US$38.50 hardbound. ISBN 1-57524-042-4.

Finding native Floridians is not always easy, but spotting aliens and transplants, particularly amphibian and reptilian ones, will be much easier with *The Exotic Reptiles and Amphibians of Florida*, a recent book that examines some cold-blooded fauna of the sunshine state. Florida, the authors note, has more species of exotic amphibians and reptiles than any other state.

Examination of the bibliography at the end of the text reveals that the authors have a history of collaborative research on Florida reptiles and amphibians, even though none appears to have a current research position in Florida. Collectively, the authors appear to have considerable experience with Florida's reptiles and amphibians.

Following a brief introduction that left me wanting more background, ecological perspective, or even history, the individual species accounts begin with the order *Anura*, the frogs and toads, and proceed by order through the turtles, lizards, snakes, and crocodilians. Nineteen species of uncertain status in Florida are included in a section following the crocodilians. Treatments of individual species, listed by scientific name, contain subsection headings that include the common name, other common names, description, body size, similar species, history of introduction and current distribution, habitats and habits, reproduction, diet, and predators. Each species description contains a photograph, ranging in quality from fair to excellent. A 5-page afterword by the senior author examines the human role in colonization of species in Florida. A glossary and appendices of 1) taxonomic units in alphabetical order, and 2) scientific and common names of species mentioned, complete the text. An extensive list of references is included.

The Exotic Amphibians and Reptiles of Florida, like so much of the work of the exotic species it describes, is a work in progress. The attractive, effective maps show reported sightings of individual species by county, and some of these maps of sightings may well be out of date by now, or may quickly become outdated. Within species descriptions, the subsections describing predators of the exotics rarely offer any reported predation, even though *something* must surely feed on some of these species. Many of the subheading descriptions within the species descriptions rely on anecdotal reportage, single case studies, or isolated research studies for their content. Certainly much about these exotics remains to be learned, especially within the context of their new environs in Florida. Just as certainly, the entire subject covered in the book is highly dynamic at this time.

Students, researchers, and ecologically oriented buffs will appreciate *The Exotic Amphibians and Reptiles of Florida.* The book is directed at the Florida scene, but many of the species are familiar exotics throughout wide areas of the subtropics and tropics. The species descriptions and supporting sections that frame them are free of much of the hostile, pejorative language of invasion biology, a fact that makes for reading that is more informative than subjective. Although some activists concerned with economically damaging exotic species might disparage the book on this issue, the authors are effective and commendable in maintaining ecologically objective language in a hazardous, emotional landscape. The product is an attractive, effective addition to Krieger's growing library of works on the ecology of Florida and the Southeastern U.S.—*David L. Scarnecchia,* Washington State University, Pullman, WA.