general, treatise on Darwin's finches (*Ecology and Evolution of Darwin's Finches*, Princeton University Press, 1986).

In the course of developing their central thesis, Grant and Grant make illuminating observations on a number of important issues in evolutionary ecology, ranging from life-history evolution to mate choice. For this reader, the most intriguing is their conclusion that introgression among related species can be a significant source of intraspecific variation. The estimated effective population size is too low for mutational input to account easily for the observed level of genetic variation. The authors argue that the depletion of genetic variation by selection is balanced by the introduction of variation through a low level of hybridization with other finch species. An important direction for future work complementing the sorts of demographic and morphometric studies of variation reported in this book will be more direct assessment of introgression by means of molecular markers.

The hypothesis that a significant fraction of intraspecific genetic variation has an interspecific origin provides a fresh perspective on the relation between community ecology and evolutionary biology. Traditionally, the community is viewed as merely setting the selective stage for microevolution. But with occasional hybridization, species that are competitors over ecological time may be mutualists over evolutionary time, each providing a store of genetic variation that can be tapped by the other. The tidy nodes of phylogenetic trees become blurred with hybridization. Maybe we should all be grateful that Mother Nature is a bit slovenly when it comes to reproduction, for this may ultimately permit the unfolding of the bountiful diversity of life on earth.

ROBERT HOLT
*Museum of Natural History,*
*University of Kansas,*
*Lawrence, KS 66045-2454*

## Mesoscale Systems

**Storm and Cloud Dynamics**. WILLIAM R. COTTON and RICHARD A. ANTHES. Academic Press, San Diego, CA 1989. xii, 880 pp., illus. $149.95. International Geophysics Series, vol. 44.

This book on storm and cloud dynamics comes at an opportune time—when august scientific bodies have declared the study of clouds and their treatment in global climate models to be of primary importance for understanding climate change (on both global and regional scales); when our capabilities for observing the atmosphere via radar, satellite, wind profilers, and sophisticated aircraft instrumentation are expanding rapidly; and when computer power and resources are advancing rapidly. One hopes that the human resources will be adequate for the task and will respond to the tremendous observational and modeling challenges made evident in this book.

So this book is very timely; it is also detailed, relatively comprehensive, quantitative, and theoretical. The reader will have no problem in finding equations describing the many physical problems involving cloud dynamics. The authors are adept at describing the applications of the equations and speculating about the reasons things happen the way they do in clouds and storm systems: how they form precipitation; how the downdrafts and updrafts interact with the precipitation particles; how and why low-level fogs and extensive stratiform clouds form and break up; how important turbulence is on a variety of scales and in a number of different theoretical treatments; how the effects of clouds of such relatively small scale can be incorporated into the much larger-scale general circulation models; how the radiative effects of clouds are important, but by no means easily determined; how the droplet characteristics of clouds can lead to greater reflection of solar radiation (if small droplets are involved) or greater absorption of solar radiation (larger droplets); how clouds at night can become destabilized by radiative processes and low-level jet effects; how clouds can merge and produce much more rain and hail than if they remain separate; how storms feed on the moisture in the environment and propagate, either under the influence of larger-scale features or by their own development, and how their precipitation and downdrafts influence the environment; how mesoscale systems, of larger scale than individual thunderstorms, form and move (an important new subject of meteorological study, because for one thing these storms may produce a major portion of a region's annual precipitation); how tropical cyclones fit into the scheme of meteorological flows; how the description of mesoscale systems, such as those leading to lake effect storms and rainbands, is leading to an understanding of the precipitation development in extratropical cyclonic systems; and finally, how mountains help to form clouds, initiate mesoscale convective systems, and produce valuable volumes of supercooled liquid water (perhaps to be tapped in weather modification projects).

The authors draw upon studies by their colleagues and students as well as their own long experience in this field and have produced a comprehensive review rather than a textbook. The extensive list of references is noteworthy. A few omissions or weakness are, however, to be found. Little is said about low-level wind shear or microbursts, which have their origin in cloud and precipitation processes; the origin of stratiform clouds via large-scale lifting; the scavenging of chemical species and the cleansing of the atmosphere by clouds and precipitation; cloud seeding and weather modification, which were the stimulus for many of the early cloud studies; and hailstorm and hailstone growth and atmospheric electricity modeling.

These are small complaints when considered against the totality of the work these authors have accomplished. Their book will be of great assistance to anyone working in the fascinating, rapidly evolving field of storm and cloud dynamics and will be of fundamental importance for studies of global and climate change.

HAROLD D. ORVILLE
*Department of Meteorology,*
*South Dakota School of Mines and Technology,*
*Rapid City, SD 57701-3995*

## Books Received

**Affect and Social Behavior**. Bert S. Moore and Alice M. Isen, Eds. Cambridge University Press, New York, and Editions de la Maison des Sciences de l'Homme, Paris, 1990. x, 277 pp., illus. $49.50. Studies in Emotion and Social Interaction.

**Alpha-Keto Acid Dehydrogenase Complexes Organization, Regulation, and Biomedical Ramifications**. A Tribute to Lester J. Reed. Thomas E. Roche and Mulchand S. Patel, Eds. New York Academy of Sciences, New York, 1989. xviii, 474 pp., illus. Paper, $119. Annals of the New York Academy of Sciences, vol. 573. From a conference, Austin, TX, Nov. 1988.

**Alvey**. Britain's Strategic Computing Initiative. Brian Oakley and Kenneth Owen. MIT Press, Cambridge, MA, 1990. xvi, 337 pp. $40.

**American Science Policy Since World War II**. Bruce L. R. Smith. Brookings Institution, Washington, DC, 1990. x, 230 pp., illus. $34.95; paper, $14.95.

**Analogies in Optics and Micro Electronics**. Selected Contributions on Recent Developments. Willem van Haeringen and Daan Lenstra, Eds. Kluwer, Boston, 1990. viii, 261 pp., illus. $79.

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