branches of mathematics aroused interest in their fundamental interconnections and principles; and Mehrtens believes that mathematicians had to secure their foundations in order to legitimize their subject for its part in *Allgemeinbildung*. We have a choice among, or a synthesis of, institutional, intellectual, and social explanations.

The contributors were not well served by their editors and publisher. The press reproduced the papers from typescript with little or no editorial intervention. The English of some German contributors is poor, and pompous claptrap abounds. An American professor writes: "The University of Berlin, founded in 1810, was relatively new when compared with older German universities, which traced their origins back to the Middle Ages."

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Inland Fishes

Fishes in North American Deserts. Papers from a symposium, Fort Worth, Texas, June 1980. ROBERT J. NAIMAN and DAVID L. SOLTZ, Eds. Wiley-Interscience, New York, 1981. xii, 552 pp., illus. $42.50.

"Desert fishes" may sound incongruous, but lying within the vast stretches of arid lands in the American Southwest are small, often ephemeral bodies of water, islands in a sea of sand and rock. The vertebrate inhabitants of these waters are primarily teleost fishes, the few remnants of a diverse Neogene-Pleistocene ichthyofauna. Interest in these fishes from an evolutionary perspective and the realization that the entire fauna is threatened with extinction have resulted in a great increase in attention from many quarters. In 1980, in concert with the American Society of Ichthyologists and Herpetologists, the editors organized a symposium to summarize the state of knowledge of American desert fishes. The chapters in the book fall into four major conceptual areas: the history of the geological areas and their faunas, ecology, desert fishes as models for the study of evolution, and conservation. The reader comes away from the book with increased conviction of the worth not just of the fishes but of the ecosystems, in economic, scientific, and aesthetic terms.

The history of these desert areas and of the fishes is summarized by M. L. Smith and R. R. Miller. The latter author presents a useful and detailed summary of the paleohydrology of southwestern deserts and of the history of the pupfishes, *Cyprinodon*. Aquatic ecology is dealt with by G. R. Smith, G. A. Cole, and R. J. Naiman. These papers describe many of the factors that make up the unique desert environment, including aquatic chemistry, thermal conditions, flow characteristics, and habitat size.

A large portion of the book is devoted to desert fishes as models for evolutionary study. Taken together these papers show that relatively little in the way of trenchant adaptation to the desert environment has occurred. The contributions of G. D. Constantz (life histories), A. Kodric-Brown (facultative changes in reproductive behavior), S. D. Gerking (stress responses in reproductive behavior), D. L. Soltz and M. F. Hirshfield (lack of differentiation in structural genes), C. R. Feldmeth (temperature tolerance), and S. D. Hillyard (energy metabolism and osmoregulation) show that the living fishes have survived by virtue of facultative behavioral and physiological adjustments. Fishes endowed by their ancestors with the appropriate tolerant constitution and the luck to be in permanent water have survived; fishes less well endowed or less lucky have failed.

Conservation is the dominant theme of authors E. P. Pister and J. D. Williams. Pister discusses the formation and role of the Desert Fishes Council, illustrating how concerned academics, government employees, and citizens can be effective in molding public policy and perceptions about conservation. Williams explains the ins and outs of the federal programs concerned with endangered species, although in the light of recent developments it remains to be seen how much of this protective structure will survive. A. A. Schoenherr discusses the effects of introduced exotic fishes on native desert fishes; he concludes that, contrary to popular opinion, exotics often eliminate native species not by competition for food resources but by predation and disruptive social interactions. R. J. Behnke's plea for the maintenance of genetic diversity is eloquent and should be read by fisheries biologists responsible for resource management.

This book has both the strengths and weaknesses of a symposium volume—experts discussing what they know best but with some unevenness in perception and writing ability. Some contributions are of highest quality, and a few could have been more tightly edited, shortened, or questioned with respect to fundamental assumptions. Nevertheless, as a summary of our immature but growing knowledge of desert fishes, the book deserves serious consideration.

Potential buyers should know that the book was apparently prepared on a word-processor and photo-offset and it does not have the look of a book this expensive. The book is available through the American Fisheries Society at a $7.50 discount.

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Chemical Senses

Biochemistry of Taste and Olfaction. Papers from a symposium, Philadelphia, Apr. 1980. ROBERT H. CAGAN and MORLEY R. KARE, Eds. Academic Press, New York, 1981. xxiv, 540 pp., illus. $38.50. Nutrition Foundation Monograph Series.

Despite the inherently chemical nature of gustation and olfaction, biochemists have avoided the study of these processes, preferring simpler systems where methods are well established and background literature is plentiful. However, with the development of modern analytical techniques, the mushrooming of literature in the neurosciences, and an increasing interest in nutrition and the palatability of foods, some biochemists and biochemically oriented investigators have begun serious research on taste and smell. In *Biochemistry of Taste and Olfaction*, a collection of papers from a symposium, investigators both present work from their own laboratories and review the relevant literature.

The first and second sections of the book deal with the receptor mechanisms of olfaction (six chapters) and taste (four chapters). Here, the term "receptor mechanisms" is somewhat confusing until one realizes that it is the receptor membrane, not the receptor cell, that is being discussed. The book begins with a well-developed paper by Gower, Hancock, and Bannister on the biochemistry of pig pheromones. The paper raises the possibility that androst-16-enes, or similar compounds, are involved in human social interactions. For example, it has been reported that the menstrual cycles of close female friends or of women living in residence halls become synchronized after a time, probably due to odor cues. In chapters 5 and 6, the major histocompatibility complex is treated with respect to its olfactory role. This is a special case of discrimination between