spruce, is the oldest pollen recognized, and an analysis shows that the peat in the main northern and western parts of the swamp is entirely a product of freshwater plant growth. The peat formation was once surmised to have resulted from ponding due to beaver activity, but that view is now rejected. (In fact, the beaver does not now occur there.) Instead, sea-level changes, profoundly affecting the water table, may have been responsible.

Charles Handley prepared an annotated list of mammals after exploring past, sometimes anecdotal, reports and making necessary corrections of previous identifications. He believes that the cottontail rabbit is more numerous than previously, owing to drier terrain, related to drainage changes. The marsh rabbit, here in the extreme northeastern part of its range, is not abundant. The white-tailed deer and black bear, both hunted actively, are the largest wild animals of the swamp. It is recorded (p. 299) that between 1763 and 1768 George Washington visited the swamp at least five times and "found a glorious paradise abounding in wild fowl and game."

James Matta reports on aquatic insects; he, too, evaluated earlier records, and he personally made more than 100 individual collections from the swamp. In his paper 155 aquatic insect species are enumerated, with information on preferred habitat, distribution elsewhere, and seasonal appearance. They represent seven orders and 34 families. All records are carefully documented. An editorial note on p. 220 states that 27 species, including many Odonata, have been added by Matta since the manuscript was received for the volume; in view of the rich insect fauna, further collecting may yield additional species.

In addition to the several census-type papers on fauna and flora, several special papers deal with a simulated model involving a population of white-footed mice, the ecology of two dominant tick species that occur in the swamp, and two inadequately known species of ferns.

To summarize, this is a very substantial, useful book that will be valuable for several generations to come as a source of information. The editor and contributors merit hearty commendation. Biologists interested in further field studies should contact the office of the Dismal Swamp National Wildlife Refuge, Suffolk, Virginia 23508.

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Preservation Efforts

Survival or Extinction. The Practical Rôle of Botanic Gardens in the Conservation of Rare and Threatened Plants. Proceedings of a conference, Kew, England, Sept. 1978. HUGH SYNGE and HARRY TOWNSEND, Eds. Bentham-Moxon Trust, Royal Botanic Gardens, Kew, 1979. x, 250 pp., illus. Paper, $17.

The adoption of the Convention of International Trade in Endangered Species of Wild Fauna and Flora on 3 March 1973 and its later ratification provided the needed stimulus for many countries to take notice of the conservation problem and even adopt their own laws regarding threatened and endangered species. Initially, many of the signatories to this convention were unable to identify the endangered elements in their own floras so as to develop lists of species eligible for protection. Many workshops and conferences soon followed. The early conferences and the publications stemming from them were dominated by two themes: the rapid destruction of tropical rain forest and the lack of data regarding threatened and endangered species. Now, conference proceedings are citing examples of successful projects and progress along many fronts. Documented accounts of the disappearance of the rain forest continue, however, leaving little grounds for optimism. As a series, the conference proceedings published since 1973 constitute a valuable record of the mobilization and multifarious efforts under way to save or prolong the existence of some of the plant genetic resources, yet they are also a record of the continued extirpation of plant species.

The theme of the conference from which the present volume results was the role botanical gardens can play in the conservation effort. The 34 papers it contains deal mainly with projects and programs involving European flora, although papers concerning Mexico and portions of Asia, Africa, and South America are included. Noticeably absent are papers relating to projects in the United States and Canada, despite the large number of botanical gardens in the two countries. This may be due to the failure of North American botanical garden personnel to participate in the conference or it may reflect the low level of activity in North American gardens prior to 1978. I suspect both answers have some validity.

Thompson's paper on the preservation of plant resources in gene banks within botanical gardens should be compulsory reading for all botanical garden administrators. Too often such administrators refer to their gardens as living gene banks, but, as Thompson states, the gardens "fulfill virtually none of the functions of a gene bank, nor in their traditional form could they." Botanical gardens can serve important functions in the study and evaluation of species, in increasing the numbers of individuals, and in the reintroduction of stocks into the wild. The problems of maintaining whole plants in living collections are compared with the problems of maintaining the plants or populations in seed banks or in vitro cultures. Seed banks are considered the best means because the cost is lower and there are fewer problems in maintaining the materials.

The activities of the botanical gardens in the U.S.S.R. are summarized by Gogina. Especially interesting is information concerning the formation by the Council of Botanical Gardens of a special committee for threatened plants in 1974 and how the council and committee are coordinating the efforts of 115 gardens throughout the Soviet Union. Individual papers on the threatened flora of Kazakhstan and on the Tibilsi Botanical Garden in Soviet Georgia provide further insight into the direction and scope of their activities.

This collection of papers is superior to other such efforts. It represents an important stage in the documenting of the battle to preserve the world's botanical diversity. The editors have provided a set of consistently good papers, and *Survival or Extinction* is an important reference for anyone working with rare or threatened plant species.

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Books Received

American Sign Language and Sign Systems. Ronnie Bring Wilbur. University Park Press, Baltimore, 1979. xvi, 312 pp., illus. $24.50. Perspectives in Audiology Series.

Applied Medical Geography. Gerald F. Pyle. Winston, Washington, D.C., and Halsted (Wiley), New York, 1979. xiv, 282 pp., illus. $19.75. Scripta Series in Geography.

Behavioral Sex Differences in Nonhuman Primates. G. Mitchell. Van Nostrand Reinhold, New York, 1979. xviii, 516 pp. + plates. $27.50.

Carcinoembryonic Proteins. Recent Progress. Papers from a meeting, Copenhagen, Aug. 1977. Bent Nørgaard-Pedersen and Nils H. Axelsen, Eds. Published for the Scandinavian Society for Immunology by Blackwell,

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