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Perspectives in Tropical Botany: Introduction

Author(s): P. B. Tomlinson and Peter H. Raven

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## MISSOURI BOTANICAL GARDEN

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### PERSPECTIVES IN TROPICAL BOTANY: INTRODUCTION

P. B. TOMLINSON<sup>1</sup> AND PETER H. RAVEN<sup>2</sup>

The following papers were presented at the Symposium entitled "Perspectives in Tropical Botany," held 22 August 1977 during the 28th Annual Meeting of the American Institute of Biological Sciences, Michigan State University, East Lansing. It was cosponsored by the Botanical Society of America, Ecological Society of America, American Society of Naturalists, and American Society of Plant Taxonomists.

Intensified studies of the plants, vegetation, and ecosystems of the tropics is not some esoteric or arcane aspect of pure science but essentially an area of applied biology which is much neglected. A number of familiar factors contribute to a feeling of urgency among tropical plant biologists which lead to this small symposium:

- (a). The greatest concentration of floristic and functional diversity occurs in the tropics.
- (b). There is a relative dearth of active research scientists in the field of tropical botany.
- (c). Tropical ecosystems are being destroyed at a rapid rate without adequate compensation in terms of conservation of representative vegetation types and of genetic resources.

The total effect is one of an overall deficiency in our understanding of biological processes in plants, which is unfortunate since it occurs within countries which have predominantly agriculturally based economies with plants as a major natural resource. This message is stated to the point of tedium, but it needs constant attention by professional biologists.

This symposium emphasized that this imbalance presents a problem of universal concern. Tropical botany is not a discipline set apart from the rest of

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<sup>1</sup> Harvard University, Harvard Forest, Petersham, Massachusetts 01366.

<sup>2</sup> Missouri Botanical Garden, 2345 Tower Grove Avenue, St. Louis, Missouri 63110.

plant science—it is an essential aspect of the whole subject, and for this reason any deficiency in our understanding of tropical vegetation is detrimental to our total understanding of the biology of plants. Any comparative study of plant form or structure is based on incomplete premises if it does not take into consideration the total range of natural variability in plants, i.e., including the enormous diversity of plant life in the tropics. Any physiological mechanism or ecological response has been analyzed insufficiently if it does not consider how these mechanisms or responses are mediated in tropical climates and especially in the nonseasonal climates of the lowland tropics. Any evolutionary idea has been incompletely scrutinized if it has not been tested against tropical examples. Any generalizations of plant population biology must apply to the frequently distinctive composition of tropical forests.

And yet this cosmopolitan consideration is frequently lacking because of the enormous geographical paradox that besets biology—namely, it is temperate based, with its practitioners trained and deployed within relatively depauperate temperate ecosystems. The paradox is heightened by the fact that the greatest repository of known information about tropical plants resides in the herbaria and libraries of temperate countries.

The object of the Symposium was to call upon a group of contributors, chosen because of their wide research experience in the tropics, and ask them to comment upon the present status of an aspect of tropical plant science wherein they are acknowledged experts. The further suggestion was made that they assess future needs in tropical research, although this was not a prime requirement.

Tropical biology has developed enormously in the United States since World War II partly by the efforts of a number of institutions which have emphasized the discipline and particularly by the concerted action of a group of Universities that led to the formation of the Organization for Tropical Studies which has provided a mechanism whereby a generation of biology students have been introduced to the tropics. An overview of an important aspect of tropical science is therefore appropriate at this stage, and we hope that the limited opportunity for presentation which this Symposium permits will generate further interest and action in the field of tropical botany. Whether we look back over what has been achieved or forward to what has still to be done, the opportunity for a brief appraisal is a welcome one.

The twentieth century draws rapidly to its end—a century in which scientific advance has wrought endless miracles, culminating in the technological expertise which allows us to explore the universe directly. How unbalanced might our perception become before we discover that too little has been done too late to allow us to understand our more immediate environment, which after all provides us with food, energy, shelter, and an abundance of natural, renewable resources—the environment provided by the plant kingdom.