VII. WHAT A BOTANIST CAN CONTRIBUTE TO CONSERVATION IN MALESIA

Reviewing the conservation situation in Indonesia, we see that concern for animals outweighs that for plants. Sumatra with its richer fauna of large mammals, is better cared for than Borneo with its richer flora*. Too often in the reports, a forest is called a forest, to the neglect of the amazing diversity among the lowland primary rain forests. The absence of botanical expertise beyond the surface is evident throughout, and but occasionally regretted. In view of the great species diversity, and of the fact that this is located in primary vegetations, for animals of nearly all groups as well as for plants, plant conservation clearly comprises at least half the conservationist's job, in a humid tropical forest region like Malesia. A botanist's contribution can be summarized in the following areas:

1) State of the vegetation. Most instructive is the table in R.F.DASMANN e.a., 'Ecological Principles for Economic Development' (1973) p. 60-61, where an elementary comparison is given between Pioneer, Early secondary, Late secondary, and Climax forest, on 21 points, and the table by VAN STEENIS in UNESCO, 'Natural resources of humid tropical Asia' (1974), p. 274-275 (in the 'Botanical Panorama') reviewing all the many factors that exert an influence on vegetations. This is all done in the field; air and ERTS photographs can help.

2) Floristic composition and wealth. These, of course, determine much of the conservation potential of an area, and its position among other reserves as a complete representation of botanical diversity. This diversity is reflected in its value as a gene pool and as a silvicultural resource. This work is done during quick field surveys (or long ones if collections are made for taxonomic purposes) but much can be accomplished in the Herbarium as well.

3) Identifying the useful plants, sources of minor forest products (like rattans, fibre plants, medicinal or toxic plants, wild fruit trees, etc.). A quick survey of I.H.BURKILL's 'Dictionary of the Economic Products of the Malay Peninsula' (1966), native plants only, revealed that no less

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* P.S.ASHTON's Flora Malesiana MS. gives 380 species of Dipterocarpaceae for Malesia; Borneo has 263 sp. of which 62% endemics, Malaya has 161 sp. of which 21% endemics, Sumatra has 83 sp. of which 14% endemics, the Philippines have 44 sp. of which 50% endemics.

The same author's 'Factors affecting the development and conservation of tree genetic resources in South-east Asia', p. 189-198 in Burley & Styles, Tropical Trees (1976), makes a fine illustration of a botanist's contribution to conservation opinion; see Bibliography for summary. See also Dr. Kuswata Kartawinata's 'State of Knowledge' in the Reviews.

than about one third of the flowering plant species in Malaya are useful in some way.

4) Assessment of research potential, on account of important plant families which occur, in view of the state of taxonomic, ecological, phytochemical knowledge about them. This work must be done in the field.

5) Setting up an infra-structure for biological research. The diversity in a reserve is roughly to be mapped, trails laid out, common plant species marked, identified, labelled, voucher specimens collected and made available.

6) Scanning of literature, in order to support other workers. Only a botanist can be expected to have access to the many publications on reserves, vegetations, landscapes, plant families and genera, and to have an idea about their very unequal value.

7) Interpreting vegetation maps, which are a many-purpose instrument to land assessment and integrated planning, as well explained by A.W.KÜCHLER in his book "Vegetation mapping' (1967). The 'International bibliography of vegetation maps' vol. 3 (1968) by the same author lists the maps of Malesia and parts of it.

8) Decision-making, based on all foregoing points. Which areas are worth keeping, what gaps are there to be filled, what measures are to be taken or not to be taken to enhance their conservation value.

9) Advising and contributing to integrated development, with regard to land use planning, reforestation, watershed management, and other activities in which conservation must play a part.

10) Algologists are indispensable with regard to fisheries, and in general, management of open water resources and coasts.

If we are to specify the qualifications of a conservation botanist for Malesia, it is evident that he must have a wide knowledge of plant families, and be at home in taxonomic reference works. It should also be emphasized, that there are considerable botanical differences between on the one hand Sumatra Malaya Java Lesser Sunda Islands Borneo Philippines, and on the other Celebes Moluccas New Guinea Solomons. Particularly New Guinea holds a place of its own, also because of the fauna, and of the characteristic patterns of landownership which reflects upon conservation policy.

Persons who satisfy all these criteria are rarer than the most threatened species, of course. But young biologists who want to be educated in this direction may remember that at the Rijksherbarium a fair amount of relevant knowledge is available on which they later can fruitfully build their field experience.

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