

and there has been a resurgence of interest in these snails. This makes it all the more regrettable that we are now witnessing the rapid decline and disappearance of these organisms as a result of disease, dilution of the native forests, rats, and other factors. Detailed biological investigations should be made now, and perhaps ways and means should be formulated to save the most adaptable species for posterity. Of all bird families, the Hawaiian honeycreepers (*Drepaniidae*) provide the most striking examples of adaptive radiation with all its implications for the understanding of evolutionary processes. We know virtually nothing about the ecology and breeding biology of any species of this strictly endemic family. Some of the species are already very rare, and a few may, in fact, be extinct.

Among plant groups the study of which is urgent, attention was called to such genera as *Gouldia* (Rubiaceae), *Euphorbia* (Euphorbiaceae), *Cyanea* (Campanulaceae, subfamily Lobelioideae), *Adenophorus* (Filicineae, Grammitidaceae), and *Metrosideros* (Myrtaceae). The endemic genus *Gouldia*, although considered in the most recent monograph as comprising only three species, has generated an almost unbelievable number of varieties and forms, which all seem to hybridize wherever their ranges overlap. *Gouldia* provides ideal material for studying the evolution of plant groups on volcanic islands, but many of its form have already disappeared or are in present danger of extinction.

4. *Studies of the Spread and Effects of Invasive Species*.—Over the past century one of the most spectacular phenomena in the terrestrial biology of Hawaii has been the more or less explosive invasion by introduced species of environments formerly occupied by native organisms, with resultant change or elimination of the native communities and ecosystems. Among the exotic invaders which were discussed are mites, ants, axis deer, mongoose, pigs, goats, blackberry, lantana, pamekane, Christmasberry, and gorse. Two species of guava have established themselves and taken over great areas of formerly native forest.

The "ilima" (Malvaceae: *Sida fallax* group) is a plant of central Pacific origin which is native to Hawaii and has there undergone great diversification and evolution. Professor St. John has been gathering material toward a revision of the group, which in the Hawaiian Islands has developed variations with weedy tendencies which become abundant where there has been grazing and trampling. Thus invasive organisms, although usually naturalized from other lands, are not necessarily always introductions. In the Planning Committee discussions it was recognized that those few instances of native organisms which have "profited" by the upsets in the biota caused by man should also be considered worthy of study in this project.

5. *Native Communities and Ecosystems Which Should Be Studied*.—During the conferences there was surprising agreement among the participants as to the areas which should be given special attention. In all cases these are localities in which the effects of modern destruction are minimal. The general categories include rainforest, bog, dry forest, and sand dunes, of which the last two are the most threatened. Of the dry forests, those which still remain in the most primitive condition are on the island of Hawaii, and a number of specific localities on that island were recommended for intensive study. Of the rainforests, the Waikamoi Forest area of East Maui stands out for a number of reasons, but especially for its relatively undamaged condition, its altitudinal range, and its great size. In fact, the Planning Committee felt that if it proves desirable to set aside a single area for intensive ecosystem investigations by other subcommittees of the US/IBP, the Waikamoi Forest would be especially suitable. However, the consensus was that because of the urgency of the situation, priority should be given by this project to descriptive ecological studies, and that highly detailed and expensive "in-depth" investigations of one or more selected ecosystems should be the responsibility of other subcommittees of the USNC/IBP. If such an ecosystem study should be approved for Hawaii the Hawaii Terrestrial Biology Project could provide more extensive and complete cooperation on its systematic and geographic aspects than would be available for almost any other site.

6. *Development of Lists, Manuals, and Bibliographies*.—The Planning Committee recognized that most efficient progress on the Hawaii Project will require developing proper source materials. It was discovered, in fact, that a considerable amount of work has already been accomplished in this direction, e.g., by the Pacific Information Center. What is now needed is to collate what has been done and to publish it. As for checklists, various authorities have made lists of particular groups for their own use, which are not known or available to others; it is necessary now to bring these together and revise them (indicating the names of the revisers). Manuals are greatly needed; this is especially true for the local flora, as Hillebrand's great "Flora of Hawaii" is now over eighty