

tion, as has happened with many other laboratories such as the Marine Biological Laboratory at Woods Hole where either lack of funds or lack of vision prevented acquiring such field areas when it was possible to do so.

Furthermore, it is recommended that foundations give serious consideration to proposals submitted by well staffed field stations and ecological institutes for regional inventories, which include functional as well as descriptive and taxonomic measurements and which consider the "biological basis for human welfare" as emphasized in the proposed International Biological Program (IBP).

5. Theoretical research in ecology should be increased in the future and more theoretical papers should be solicited and published in ecological journals. At present, many theoretical papers of great importance to ecologists are published in non-ecology journals, partly due to a mistaken widespread impression that *Ecology* and *Ecological Monographs* consider only "data" papers, and partly due to lack of space in these existing journals. While one hesitates to suggest increasing the number of biological journals, there is no question that the field of ecology is not represented by a reasonable share of journals in the USA.

6. Since manpower is perhaps the most critical shortage in the ecological area the following recommendations are considered especially important.

a. An immediate inventory of existing manpower in ecology, and a forecast of manpower available four years hence is essential. The existing Scientific Rosters are not adequate of such inventories because (1) many persons who list themselves as ecologists are, in reality, primarily interested in taxonomy, evolution or other areas, and (2) many scientists (for example, soil scientists or entomologists) who are doing important work in ecology do not always list themselves as ecologists.

b. An increasing number of training type grants for coordinated ecology programs (see item 2 above) should be strongly recommended to NSF, NIH and other granting agencies.

c. The number of senior fellowships should likewise be increased to enable ecologists who lack experience with recent technics and ideas (as for example radioisotope procedures or ecosystem theory) to spend sabbatical, etc., at centers where modern experimental facilities are developed (see item 3 above).

d. Financial support for a series of "in depth" symposia and special "institutes" (patterned after the summer training institutes which have done much to upgrade many fields of biology) should be sought so that much needed exchange of ideas can be facilitated. Such symposia and institutes should deal with both basic and applied aspects in balance as suggested by the following titles: "systems ecology", "population biology", "environmental biology for civil engineers", "environmental biology for urban planners", etc.

e. The National Academy of Science should be encouraged to develop some kind of effective interagency environmental committee in Washington to aid in the coordination of the many environmental science groups. At present there is much duplication of effort by these groups and all too frequently an unintentional development of contradictory policies.

7. It is recommended that the establishment of a national center for environmental sciences be seriously considered.

FROM THE FIRST DRAFT OF A REPORT ON ECOLOGY (CHAIRMAN OF PANEL, A. H. HASLER) TO BE A CHAPTER IN THE SUMMARY OF RESEARCH IN THE LIFE SCIENCES, SPONSORED BY THE NATIONAL ACADEMY OF SCIENCES

IV. FUTURE TRENDS

Ecology is already a rapidly growing discipline. Since it does not yet show the effects of the added stimuli that come from a new ability to cope with complexity, and from the new national emphasis on environmental problems, it will grow even faster in the future. The additional impact of the International Biological Program, which will relate ecology to the problems of man on a worldwide basis, produces an immediate need for at least doubling the number of ecologists in this country.

There is an increasing awareness among scientists and non-scientists alike that the most difficult problems facing mankind in the question of his continued, harmonious existence on this planet are at a level of biological organization and complexity that also provide the greatest, and perhaps the ultimate, challenge in biological research. All biological events occur in an ecological context, and it is at this level of organization that such events have their ultimate meaning.