onstration plants, exploring the matter of funding for oil shale development, seeking a balanced R & D program for coal mining, and encouraging of techniques for secondary and tertiary recovery of oil and natural gas.

McCormack, a former staff scientist at the Atomic Energy Commission's Hanford Washington facility and now a third termer in the House, was an early and articulate exponent of action on energy problems. He is also a member of the Joint Committee on Atomic Energy, which has jurisdiction over nuclear R & D, and is identified with the view that further development of nuclear power is necessary and can be accomplished safely. With the retirement from Congress last year of Representatives Chet Holifield and Craig Hosmer, both aggressive advocates of nuclear power, McCormack is seen as having the expertise to take over the role of chief congressional nuclear protagonist if he is so inclined.

McCormack's subcommittee handles the ERDA authorization minus fossil

NAS Reports on International Biological Program

A comprehensive report on the International Biological Program (IBP), the first large-scale attempt to apply systems analysis to the workings of ecosystems, has finally been issued by the National Academy of Sciences (NAS).* The U.S. component of the IBP, begun in the late 1960's and concluded in mid-1974, has been overseen by a national committee under the aegis of NAS. The report was actually completed in mid-1973, but in keeping with the cautious workings of the academy it was not released until this January, at the annual meeting of the AAAS.

While the methodology and contributions of the IBP have been a matter of considerable controversy among ecologists, those who participated in the program consider it to have been a success. They believe it has validated the interdisciplinary team approach to the study of ecosystems as well as the use of systems analysis and mathematical modeling, which, they say, has turned ecology from a descriptive science into one with predictive capabilities that will aid policy-makers in making sophisticated decisions on resource management.

The U.S. component of IBP absorbed about $50 million, mostly from the National Science Foundation (NSF), over a 7-year period. Most of this went into studies of five biomes—grasslands, tundra, desert, coniferous forest, and eastern deciduous forest. Smaller projects within the "environmental management" part of IBP included studies of biological pest control in five major agricultural ecosystems, aerobiology (long-distance dispersal of airborne materials), and marine mammal ecosystems. The other major component of the U.S. portion of IBP involved the study of "human adaptability." Here, select populations (Eskimos, Andean Indians) were studied to determine the limits of physiological adaptation to one's environment and to get baseline data on health of peoples as yet relatively untouched by "civilization." The human adaptability studies involved active cooperation with foreign scientists and organizations; the biome studies were U.S.-based, although researchers have kept in touch with similar efforts in other countries via international conferences.

The NAS report claims that IBP findings have already found numerous applications in forest and water management, control of toxic materials, regional planning, preparation of environmental impact statements, and improvements in health sciences.

A number of scientists—perhaps the most outspoken being Nelson G. Hairston of the University of Michigan Museum of Zoology—have expressed skepticism about whether IBP did anything that wouldn't have been done anyway, and for less money. Critics suggest that the program has provided research funds to second-rate researchers who wouldn't have qualified for grants under the regular NSF grant programs; they suspect that money that might have gone to outstanding individual researchers has been funneled instead to IBP; and they opine that the biome studies have accumulated masses of data while failing to establish chains of cause and effect that could lead to deeper understanding of how ecosystems work. (Hairston quotes one scientist as complaining that the researchers were "getting all the nouns and none of the verbs.") Hairston calls IBP, the concept of which was modeled on the International Geophysical Year, a perfect example of "ecopolitics"—getting up a sexy-sounding program to squeeze money out of Congress.

The other side of that coin is: What's wrong with playing politics if it means more money for a fledgling but vitally important field, ecosystem science? Stanley I. Auerbach of Oak Ridge National Laboratory, who ran the deciduous forest biome study, says the critics don't take into account the fact that if more money had been requested for routine research grants in ecology, Congress, in those pre-environmental crisis days, probably would not have been sympathetic. Orie L. Loucks of the University of Wisconsin, who coordinated the environmental management programs, adds that critics don't understand the NSF criteria for issuing the block grants that went to IBP participants. He says the proposals had to show that a study would reach a level of multidisciplinary integration that could not be achieved if the parties involved worked separately. Interdisciplinary teams wouldn't have gotten funded through normal channels, he says.

It will be some years before the contributions of the U.S. segment of IBP can be evaluated. Two follow-up efforts are already in the works. One is an independent review by Battelle Memorial Institute of the quality of the scientific work sponsored by the IBP. The other assessment, by the NAS, will seek to determine how the IBP approach—multinational, multi-institutional, and multidisciplinary—can be applied to future ecosystem studies. Meanwhile, the actual findings of the IBP will be coming out over the next few years in a steady stream of books and scientific reports.—C.H.

* A limited number of free copies of the 165-page report, *U.S. Participation in the International Biological Program*, are available from Russell Stevens, Division of Biological Sciences, NAS, 2101 Constitution Avenue, NW, Washington, D.C. 20418.