The Importance of Biological Field Stations

Edward O. Wilson

I believe that in the not too distant future a much larger share of research on biology, from biochemistry to ecology, will be conducted at field stations. The reasons are inherent in the history of the science.

Karl von Frisch once observed that the honeybee is like a magic well: The more you draw from it, the more there is to draw. This is a truth with many facets. Sitting against a laboratory bench oblivious to nature outside, one could devote a lifetime to the antennae of the insect alone and still make great contributions to science. Antennal sensilla, pheromones, royal jelly, corpora allata, and color vision are in fact among the subjects of productive research that fill journals and textbooks concerned almost exclusively with *Apis mellifera*. But that is just a beginning, because when honeybees are examined out of doors, they also provide paradigms of orientation, communication, and adaptation to the environment. Even then the surface is only scratched. The genus *Apis* has a history of over twenty million years. What we study today is the product of countless interactions with other organisms and episodes of microevolution. Very little at the molecular and cellular level, and nothing particular to the honeybee, makes complete sense until it has been placed inside this broader framework.

As the horizon of biology expands we will come to appreciate more fully that every species is a magic well. Of the three to ten million estimated to exist, only about a million species have been given a Linnaean name. No more than twenty or thirty have received as much attention as *Apis mellifera*. When the most important remaining problems of cellular organization and development in these favored species are solved, biologists as a whole will certainly become more ecological and evolutionary in orientation. Their attention will shift—indeed it has already begun to shift—from *E. coli, Drosophila melanogaster*, and *Apis mellifera* to larger sets of species and the puzzles of phylogeny and adaptation. If it takes a generation to decipher *Euglena* at the molecular level, a hundred generations may be required to understand to a comparable degree the pond in which *Euglena* lives.

The greater time requirement is, of course, due to the many species that compose the ecosystem and the disproportionately steep rise in interaction effects, but it is also caused by the radically different time scales in which processes of interest occur: microseconds to hours for molecular and cellular change, hours to centuries for change in populations and ecosystems. The only places to pursue biology at this advanced and long-term level are the field stations, where free-living species are secure and data sets cumulative over generations. The biological field stations of the future will consist of both nature preserves and laboratories equipped to analyze and monitor processes at every level of biological organization, including the molecular. They will also serve as the key centers of education. Universities and other institutions wise enough to invest in such stations now, even in the face of limited present demand, will insure themselves of a much larger share in the future action.

The three articles that follow emphasize different aspects of the role biological field stations play in research, education, and conservation. Thomas Eisner demonstrates the importance of personal experiences in nature that lead to research pursuits and encourage a strong personal committment to the preservation of nature. Peter Brussard urges field stations to strengthen their conservation efforts by locating and identifying rare or endangered species and broadening their conservation education efforts. Biological field stations, as Brussard points out, often function as nature reserves. Paul Ehrlich underscores the importance of the preservation and expansion of nature reserves in order to preserve diversity, the living "capital" that we are wasting.

Organization of Biological Field Stations

The Organization of Biological Field Stations, an AIBS member society, was founded in 1966 to promote biological research and education in the field. Of the estimated 100 active field stations in the US and 30 in Canada, about three-fourths are members of the organization. OBFS has published a comprehensive list of the courses offered this summer by 30 stations, ranging from studies in marine to freshwater and desert to alpine environments. The organization also plans to publish a directory of field stations, which will be available in early 1983. For publications and information contact Richard Coles, secretary-treasurer, Tyson Research Center, Washington University, Eureka, MO 63025.

Other officers of OBFS are Richard T. Hartman, president, who is director of the Pymatuning Laboratory of Ecology, University of Pittsburgh, PA; Gordon W. Hodgson, vice president, of Kananaskis Centre, University of Calgary, Alberta, Canada; and Joseph F. Merritt, editor, of the Carnegie Museum's Powdermill Nature Reserve, Rector, PA. The 1982 meeting of OBFS will be held 17–19 September at the University of Michigan station at Douglas Lake near Pellston, MI. Future meetings held in September will be at Kananaskis Centre near Banff, Alberta, in 1983 and the Mountain Research Station, Nederland, CO in 1984.

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