ECOLOGY OF CULTURE

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Summary

Any organism lives in a particular environment. It is not only adapted to, but also interacts in different ways with its outer world. Ecology is the study of the rather complex interactions between living systems and their environment(s). Ecologists have to take into account that organisms are not simply ‘shaped’ by, but - as active systems - also influence their surroundings. This is especially true of the human species. Due to their cultural activities (particularly technology), humans have had an enormous impact on nature and have dramatically changed their (natural) environment. However, human cultural evolution cannot be separated from ecological factors, i. e. climate, natural resources, etc. There is evidence that cultural activities have been constrained by these factors and that the differences between cultures are to a certain extent results of environmental forces. Natural conditions have strongly acted upon the lifestyle of people and have formed their particular attitude toward different kinds of plants and animals, which also includes myths about many species. For survival’s sake, humans have developed various sophisticated strategies of using the natural resources. In this context, the new field of ethnoecology is of special interest. It gives us some ideas about what people have in fact learned from nature and how they have managed to cope with

their natural environment(s). Any attempt at a broad understanding of culture and cultural evolution has therefore to consider the 'ecological knowledge' acquired, stored, and transmitted in different societies. These issues are not only relevant to applied ecology but are also important aspects of the recently flourishing discipline of bioethics.

1. Organism and Environment

It is trivial that an organism cannot exist independent of an environment and live in a vacuum. Every species is, some way or other, adapted to its specific environment. Adaptations manifest themselves in various traits of any species and can be seen, e. g., in its body size, locomotory apparatus, nutrition, reproductive capacity, etc. However, adaptation does not tell us the complete story about a species, and no organism can be regarded simply as a complex of adapted characters. Rather, an organism *interacts* in many different ways with its environment: its life is indeed constrained by its surroundings, but at the same time it acts upon its outer world. Ecology is the study of these relationships between living systems and all factors that make up their environment. Ecological research considers the interactions between single organisms and their environment as well as the relationships between supra-individual entities (populations, communities, and species) and environmental factors. These factors include both physical and abiotic (e. g., climate, water, light) and biotic components. In the life of any organism, other organisms play a decisive role. This is particularly obvious, if one considers prey-predator relationships and competition between individuals of one and the same species as well as individuals of different species that depend on the same resources. Generally, biotic factors can significantly affect the abundance and distribution of a species and its populations.

1.1 Man-environment interactions

Homo sapiens is one of millions of recent species on our planet and incorporated into the *biosphere*, i. e. the part of the earth and the atmosphere that is inhabited by living beings. As is the case with all organisms, the basic problem of *Homo sapiens* is survival. Thus, like any other living system, humans struggle for natural resources and utilize, for survival's sake, many plant and animal species. However, there are two distinct, and closely interrelated, features that characterize the human way to meet the requirements of life and to master the challenges of the environment. First, humans are *producers*. This is at least true of the vast majority of their present-day populations. While other animals completely depend on the natural distribution and availability of resources, humans have the remarkable and unique ability to domesticate plants and animals and to develop more productive, more adaptable, and more resistant varieties of domesticated species. Second, to get their food, modern humans are no longer forced to use biological organs. While other species struggle for their existence by means of teeth, claws or horns and risk their lives to survive, humans have developed weapons and other instruments that help them to manage the fundamental problems of life in a most effective way.

Consequently, the world population of *Homo sapiens* has increased - and is still increasing - relentlessly. In the early 1950s, Julian Huxley - eminent biologist and Director General of the UNESCO in 1947-1948 - commented the situation as follows:

„The growth of human population on our planet has accelerated from a very slow beginning until it has now become an explosive process. It did not reach 500 million until the latter part of the 17th century. By the mid-18th century it passed the billion mark, and in the 1920s it rose above two billion. That is to say, it doubled itself twice over in the period between 1650 and 1920. The first doubling took nearly two centuries, the second considerably less than one century. Now, at the present rate of acceleration, the population will have doubled itself again by the early 1980s - i. e., in the amazingly short space of 60 years." This prognosis was quite correct - now, at the beginning of the third millenium, there are about 6 billion individuals of our species around. This is absolutely unique among primates and, generally, mammals with a body size and weight comparable to that of our species. A population of 6 billion gorillas, for example, is simply unimaginable.

It is obvious that the human species has become ecologically dominant. There are different approaches to explain this dominance. They include, e. g., the assumption that the use of *fire* gave rise to most decisive innovations in hominid evolution, the speculation that the extinction of predators specialized in killing primates (including hominids) made the spread of humans possible, and the assertion that forming *bigger groups* and more *hierarchical social structures* led to new evolutionary routines and thus triggered the final sprint in hominid evolution toward *Homo sapiens*. In this context, one can of course speculate about many factors, but it is most probable that the status of modern humans is not the result of one particular evolutionary event but a consequence of complex interactions between environmental components and the remarkable capacity of hominids to cope with their surroundings. (see ***Culture as a manifestation of human activity***)

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Biographical Sketch

Franz M. Wuketits, born January 5, 1955 in Parndorf (Austria). He studied zoology, palaeontoloy, philosophy, and philosophy of science at the University of Vienna and received his Ph.D. in 1978. He has been teaching philosophy of science with special regard to philosophy of biology at the university of Vienna (Austria) since 1980, and, besides, at the University of Graz (Austria) since 1987. From 1999 to 2001 he was Visiting professor at the Institut fr Technik und Gesellschaft at the Technical University of Vienna (Austria). His main fields of research are philosophy and history of biology and evolutionary theory including evolutionary epistemology and ethics. He is author of 25 books and published 280 articles in journals and edited volumes. He is currently co-editing a three-volume "Handbook of Evolution".