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APPROACHES TO ENVIRONMENTAL HISTORY:  
A FIELD GUIDE TO ITS CONCEPTS

*Lorena Winiwarter*

FROM THE GROUND UP: A BIOGRAPHICAL ENTRÉE

The events of history unfold in time and space. Everything that happens not only has a "when" but also a "where" determining its quality and significance. That might sound like a truism, yet, places do not figure as prominently in history as people. Environmental history, concerned with the interactions between nature and human societies in the past, gives agency to place and tries to link human history with natural systems.

In this quest, historians encounter several problems, at least if they want to transcend the boundaries of their own discipline. The problem of finding a consistent theoretical framework encompassing natural sciences, in particular biology, and the humanities has troubled many of us, and several attempts have been made to overcome it.

While this essay cannot provide a comprehensive bibliography, I will provide some reading suggestions. There are several excellent bibliographical tools for environmental history available over the internet, which can be consulted.<sup>1</sup>

Theories useful for writing environmental histories will be discussed below, but a note on my personal involvement will precede this section. While ethnographers have established self-reflection as part of the validation of their findings, historians often still do not.<sup>2</sup> For many environmental historians, their work is as much an inquiry and a political agenda as a scholarly field, and many have been in close contact with nature throughout their lives and not just as passers-by. Colleagues of mine have worked as foresters and been political activists. Many of them, besides being historians, have received training in sciences while some are or have been passionate hikers, fishers or mountain bikers. They all have their personal relationship with nature, and many write about places they have come to know intimately.

My personal relation to the field has been shaped by the fact that besides being a historian, I am a chemical engineer, in fact, I was a technical laboratory assistant before I ever started to study history. I have had the good fortune to work in a research laboratory and study air pollution right after I finished school. Everyone around me was as concerned about the state of the

environment as I was, and we all knew about the relevance of our studies. When I started working there in 1981, being "green at heart" was something we never questioned, so crystal clear was it to us that there, in the earth's atmosphere, was an ever so fragile and intricately woven system with which humans were tampering quite irresponsibly. Much later, when I studied history, environmental history without hesitation seemed the most relevant field of specialization one could pursue, because it dealt with the web of nature and did not see humans as exempt from it, a view put forward by some of the historians I encountered, which I had every reason to question.

I was working on the analytical side of chemistry. Analytical thinking is not confined to chemistry, but also an important part of historical research. But there is an even stronger link between the two. Atmospheric chemistry proved to have lasting influence on my thinking in yet another way: it is very difficult to sample air for analysis. If you take a balloon full of it – what seems the most obvious way of sampling to laymen – concentrations are very low, and most of the reactive components in the sample will react with the balloon's inner surface. Air is fugitive not just metaphorically, but also in terms of chemistry. Storing air for the purpose of trace analysis is impossible, because it is a dynamic system. Reactions take place between its constituents all the time. So every experiment is a once-and-for-all thing, you cannot come back to do it again the next day, because the air has long changed. Therefore, atmospheric chemists produce data which resemble historical records in many aspects. After seven years in laboratories, I have great respect for the methods of natural scientists, but I also have intimate knowledge of the principal constraints that scientific experiments are subject to. However, I also would like to see scientific research appreciated in its substance by scholars from other disciplines. Unreflected use of ecological or other natural scientific concepts by historians (or, for that matter, social scientists at large) yields anecdotal evidence at best. If used in analogy to culture, natural systems are not appreciated for what they actually are. Concepts are used metaphorically thus losing their theoretical and analytical quality.

The years of practical experience in a laboratory specialized in trace analysis allowed me to experience nature through work, as Richard White has described it.<sup>3</sup> I know about the tacit knowledge involved in data production and in the handicraft skills one has to cultivate in order to be a good analytical chemist.

My work as an environmental historian is done with great respect for nature's intricacy. It is based on an understanding of the dangers of human impacts on natural systems and ultimately on the presupposition that humans are part of nature as much as they are apart from it. I am sure that the elucidation of their interaction over time produces necessary and relevant infor-

mation for modern society attempts to develop a less unsustainable livelihood. As two colleagues have put it, environmental history is about the interactions between "humans and the rest of nature", a definition I subscribe to.<sup>4</sup>

What I will develop in the next pages owes much to this understanding and bears the imprint of my experiences with nature and history. The paper aims to give an overview of tendencies and thematic clusters in the field, discussing the role of socio-ecological theories for environmental historians and, thus, allowing some orientation. Many of the observations I have made pertain not only to environmental history, but to historical writing at large. However, for an interdisciplinary endeavor like environmental history, they seem particularly pressing. What I offer is a personal view, shaped by my favorite readings and aimed not at convincing but at discussion.

#### NARRATIVES, METHODS AND THE PERCEPTION OF ENVIRONMENTAL HAZARDS

Historians are concerned with the way their narratives are constructed and about their ability to weave convincing narratives out of the chaos of events. Writing environmental histories often means writing cautionary tales, stories about unexpected consequences, about destruction, about decline. Narratives of progress are less abundant, and there are, of course, writings that openly or implicitly deny the possibility or desirability of either a progressive or anti-progressive narrative, and try to write (hi-)stories of yet another kind.<sup>5</sup> Environmental history is concerned with two different endeavors, and it works best if they are interwoven: The one concern is the study of past perceptions of nature, of attitudes, traditions, etc. It can be done through hermeneutic methods, although one needs an understanding of the described phenomena to be able to judge past perceptions. The other concern is the reconstruction of past environments, of their biological, geological, hydrological, pedological and atmospheric status. As can already be inferred from the description, scientific, and in particular paleo-scientific methods are needed to pursue this goal in addition to the traditional sources historians are used to. As it is necessary to know something of both the perception and status of the environmental conditions at a given time and place, the task of environmental historians is generally interdisciplinary.<sup>6</sup>

What environmental historians all have in common is their appreciation of the interaction of nature-society relations, although some also work implicitly or explicitly with a concept that implies a notion of humans challenging natural systems. To orient oneself, it is useful to pinpoint the cognitive interests of the works one uses. Apart from the general concept of

change underlying the narrative and apart from the methods, the perception of environmental hazards upon which the empirical research is based is a main element in structuring narratives and themes. In determining what constitutes an environmental hazard, historians use present day concepts. What causes the most dangerous damage to the environment? Is the increase in human population the biggest problem or the pollution of our rivers, seas and air? Is waste and the wastefulness of society a prime issue to tackle, or rather the underlying assumption that the earth has been given to humanity as theirs? It is not possible to rank these problems on a scale, because the underlying assumptions of damage are different.

Four such underlying concepts or paradigms can be distinguished.<sup>7</sup> Most works by environmental historians belong predominantly to one (or two) of them, either because they follow conceptual history in their empirical work (e.g. a history of environmental politics necessarily reproduces the dominant paradigms of environmental hazards of their time), or because they have decided to organize their narrative around one or more of them. While certainly not all works can be allotted to one of these, they can help make conceptual differences visible. The four concepts differ in their perceptions of the kinds of human impact.

1. The toxicological or pollution paradigm. This concept is very common in environmental sciences among physicians and chemists and is probably still "the" environmental paradigm. The main question that has to be asked and answered is, which substances are toxic (for humans, animals, plants) and how and where they are released into the environment. The main political action that follows is the definition of thresholds and critical values which must not be exceeded. In effect, such definitions represent decisions about acceptable versus unacceptable risks, which depend not only on the quality of the substance in question but also on the social perception of the benefits of the same substance. To assess a given situation, values of concentrations are compared with standards. Environmental historians working within this paradigm are close to historians of technology and/or science. They look for the history of pollution, and try to reconstruct its development. Pollution can be caused by anorganic, organic, or biotic pollutants, so that epidemiological histories concerned with germs, sanitation and hygiene also fall within this paradigm. While its merits are undisputed, it prevents researchers to see the environmental damage that is e.g. caused by erosion. To perceive such environmental hazards, a different way of looking at the environment is helpful:
2. The paradigm of endangered ecological equilibrium, or endangered "balance of nature".

This paradigm is mainly used by ecologists, in particular restoration ecologists. It is the basis of conservationist thinking and also used by climatologists and agricultural scientists. The main question to be asked and answered is, what causes disturbances in natural systems. Where and how do such disturbances happen and by whom or through whose agency are they exercised? Assessments are conducted by judging the survival, the integrity and thus more general, the ecological state of natural systems. The air, like the seas, is a global commons. Imbalances in climate, such as the greenhouse effect, require trans-boundary coping efforts. Many debates about the management of common property resources are conducted within the equilibrium paradigm. Histories of erosion, salinization, or to put it in more general terms, of soil degradation, as well as those investigating land-use changes due to agriculture, construction and melioration, or histories of dammed rivers and irrigated lands are concerned with dangers to the natural equilibrium and describe both short- and long-term degradation.<sup>8</sup> As long as the conservation of terrestrial ecosystems is the main issue, measures are regulations of land-use. The idea of natural equilibrium or its newer and more dynamic descendant, the theories of punctuated equilibrium and resilience of systems provide the basis for several ecological concepts, which are used by environmental historians. It has been a question of much debate among biologists whether nature works by equilibrium, or rather by something much less stable, by punctuated equilibrium, or even by (mathematically) chaotic processes which converge towards attractors at times, but are essentially non-predictable. If historians use an equilibrium concept, they should be aware of its questionable status.<sup>9</sup> The equilibrium paradigm is just as useful and necessary as the first one, but it is limited to concerns about the impact and designation of such systems to be protected, and does not permit discussion about the danger of the production of entropy as such.

3. The paradigm of resource economy or entropy. Physicists, economists and forest scientists typically look through the lens of this paradigm. Within this concept of potential damage, the main task is to determine whether and where human societies use more material and energy than the sun provides, and the solution, accordingly, is to minimize the use of materials and energy by means of increased efficiency and sufficiency. Assessments work with the question of whether a society simply taps flows or depletes the capital stock of nature. Historians of forestry have told the story of forestry as a battle for sustainable, i.e. non-stock-depleting use of forest resources, using this paradigm, and those who

measure and research the history of energy use, of non-renewable resources and of waste use it, too.<sup>10</sup> It offers no possibility to discuss single species or minute amounts of pollutants, but is certainly a very useful way of looking at the environmental impacts of human society. Likewise, the question of dominance cannot be asked from this point of departure. But the connection between dominance and the state of natural systems is certainly worth asking, which the fourth paradigm permits us:

4. The paradigm of conviviality. Environmental philosophers (e.g. in "deep ecology"), feminist theoreticians and some theologians advocate this paradigm. The guiding question is where and when humans impair, destroy or dominate other living beings (unnecessarily). The solution is to abstain from the viewpoint of dominance and to minimize the toll one's life levies on other beings. For an assessment based on this paradigm it is necessary to determine whether human dominance is increasing or decreasing. It is quite clear that this paradigm is open for an expansion on questions of dominance between people. The strongest link between nature and dominance has been made by feminist ecology. Environmental historians studying issues of environmental equity work with it, and also those with gender-environment questions in mind.

With the paradigm comes the kind of data one needs for an historical assessment, which determines the sources one will find most useful and also the most likely environmental sciences to draw basic ideas from. Toxicological and epidemiological theories, alongside the literature on risk are necessary underpinnings for historians working with the first paradigm. If one departs from the path of an intellectual history of concepts and their use, or from a model-oriented estimation of possible effects, sources for empirical work within the toxicological paradigm are rare prior to the nineteenth century. Accordingly, works based on the toxicological paradigm or reviewing it are quite abundant especially for industrial society.<sup>11</sup>

Those using the second paradigm will make use of ecological theories such as landscape ecology provides, they will talk about niches, about the resilience and regeneration of natural systems, about habitat destruction and the appropriation of net primary production by humans, about biological invasions and catastrophes. A wide variety of data is available for empirical research into such questions, and scholarship, beginning with the work of Crosby on the biological dimension of the conquest of the Americas by Europeans has yielded much fruit.<sup>12</sup> Arthur McEvoy's long-term study of California fisheries is a good example of the use of the ecological niche concept.<sup>13</sup> Carrying capacity as a starting point is also used frequently.<sup>14</sup> The carrying-capacity concept itself and its history have been investigated

thoroughly.<sup>15</sup> Rivers and dams figure prominently. Richard White wrote a particularly complex river narrative for the Columbia River and there is also the classic study of water in the Industrialization of New England by Steinberg.<sup>16</sup> The second edition of another of White's excellent studies, his work on islands in the Puget Sound, contains a very useful discussion of the use of ecological concepts in environmental history.<sup>17</sup> Islands are a particularly interesting locale for studies of disturbance or punctuated equilibrium and have also inspired a number of seminal studies.<sup>18</sup> Histories of climate change(s) are also indebted to the principal idea that there is a balance in nature that can be altered by humans and fall within this paradigm.<sup>19</sup> Interdisciplinary research is necessary for many, if not most of such works. In many cases, the available detail and quality of data in the end does not permit an ecological analysis and estimates will always be questionable.<sup>20</sup>

Landscape figures prominently in environmental history, and landscape histories are the point where environmental history is indebted to historical geography with which it shares concepts and methods. The 'landscape solution' to environmental history narratives offers an integrated approach which need not be situated within one of the paradigms.<sup>21</sup> In most cases, though, as human-induced landscape changes come into play, the ecological grounding will be related to an equilibrium concept. Several medievalists have organized their work along a landscape concept with an equilibrium twist.<sup>22</sup>

The third paradigm is also versatile and feasible for historical research, as a lot of data on the input (less so for the output) of social metabolism are available from all kinds of accounting records as well as data on land-use which can be inferred from old maps and surveys. Green accounting, ecological economics and sustainability research are the fields to draw concepts from. Ways of evaluating human impact such as the "ecological footprint" have successfully been applied to past societies.<sup>23</sup>

But to be able to talk in input/output terms, more than for any of the other paradigms, a distinction between nature and society has to be made on a physical, material level. This problem and a possible solution to it have been thoroughly discussed by Peter Siefertle and Marina Fischer-Kowalski in their work on social metabolism and the colonization of nature. Martin Schmid has used the colonization concept to discuss the principal problems historians face in assessing the impact of humans on nature through written sources.<sup>24</sup> While it is quite common to think of society as having input/output relations with nature that constitute its "metabolism", the idea of colonizing interventions of societies into nature needs a word of clarification. Colonization is used to denote the purposeful actions of societies towards natural systems, such as in agriculture, breeding of livestock or genetic engineering. These so-called "colonizing interventions" describe those relations between nature and

society that cannot properly be conceptualized using the idea of a metabolic interaction, but comprise the important changes societies undertake in natural systems. The usual example is agriculture: Natural processes are responsible for crops: photosynthesis and plant metabolism. But humans alter the framework conditions under which those natural processes work by tilling, draining, weeding and a bundle of interventions that are designed to keep the natural system (field) in the desired state, the one which renders it most useful for society. The development of such interventions offers a basic concept useful for long-term considerations.<sup>25</sup>

Looking at questions of dominance from the angle of resource allocation, or asking who bears the cost of modernization in ecological terms can be pursued from a wide variety of sources, many of which have already been used, albeit without taking much notice of the role nature plays in them. Environmental histories have focused on legal concepts, the role of natural sciences and quite openly, the connection between power and nature.<sup>26</sup>

Ecological concepts *per se* do not allow a valuation of the impact of humans on nature. Valuation, putting virtual price-tags on species or natural systems, is discussed within ecological and environmental economics with a multitude of concepts and in great detail. The basic question of intrinsic values versus present economic value, versus an economic value that might be attached to a good in the future is an economic and ethical problem, for which biological expertise often is sought, but ecology itself cannot provide an answer. Whether the value of a butterfly is higher than that of a moth, or that of a nematode, has to be decided on grounds other than ecology provides.<sup>27</sup>

#### HUMAN EXEMPTIONALISM AND THE NEW ENVIRONMENTAL PARADIGM

Besides the paradigm of environmental hazard applied in studying the interactions between society and nature, the principal role of humans in relation to the natural world is a question of great relevance to environmental historians. Fig. 1 gives an idea of the spectrum within which the concepts are situated.

Writings on the intellectual history of human attitudes towards nature precede the emergence of the field in environmental history. Clarence Glacken's classic study "Traces on the Rhodian Shore" still represents the most comprehensive overview.<sup>28</sup> However, the concept of nature as such is elusive, despite philosophers' attempts to define it: As nature serves as the 'other' of society, concepts of nature are always reflections of one's social constructions. A mere constructivist view, however, misses the point. Cultural constructions are important, but the material world cannot be reduced to a

construction. The model of Siefertle and Fischer-Kowalski is also of help in this respect, arguing for different and independent sets of rules governing nature and culture, but combined through the physical existence of the bearers of culture, that is, human beings. Siefertle has also written on the historical changes in constructions of nature.<sup>29</sup>

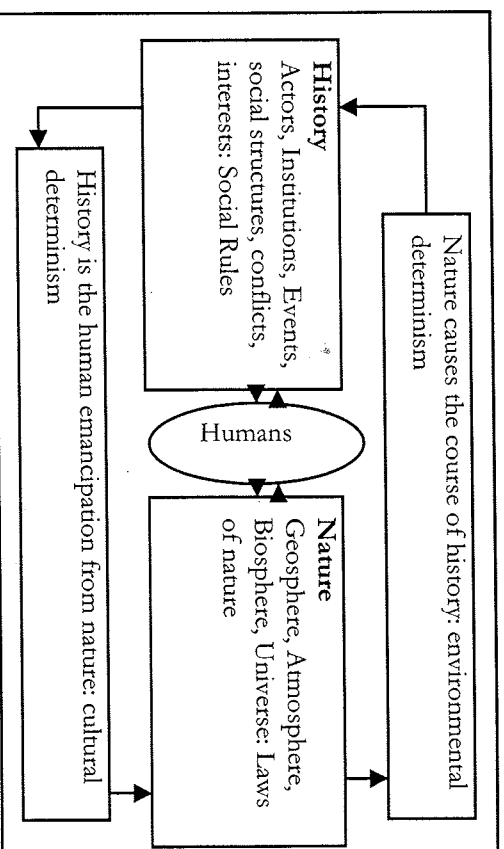


Fig. 1. Interactions of nature and history as viewed in deterministic concepts

Even if one accepts the non-reducible quality of nature and culture, the question remains, just how influential natural forces are for the development of human societies. The dominant paradigm of the twentieth century with respect to this question has been the idea of human exemptionalism. It advocates that because humans, and only they, have culture, they are exempt from many biogeophysical laws and constraints. Because culture allows humans to change faster than nature can change, culture (e.g. as applied in techniques) can fix almost anything. Differences between individuals, according to human exemptionalism, are a result of social differences, and thus, can change with social change. In contrast, the 'new environmental paradigm,' the one that environmental historians are at least partially subscribing to, has its starting point in the idea of conviviality. Humans are but one species in the biotic communities that shape our social life. Human actions are prone to have unintended consequences, and these might well be beyond the repair-capacities of humans, despite their technical advancements. In a finite world, there are constraints to all physical processes, and humans are physical, too, so constraints to economic growth and social progress are bound to exist.<sup>30</sup> Environmental history need not be Malthusian to subscribe

to this paradigm, there is certainly room for stories of successful adaptation,<sup>31</sup> but the cornucopian worldview with its exemptionalist background is generally not held by environmental historians.

#### ADAPTATION, CO-EVOLUTION AND THE BIOLOGICAL INTERPRETATION OF CULTURE

The paradigms, questions and methods of environmental historians are shaped by their subject matter, nature, in many ways. A theoretical link that goes even beyond this point becomes apparent when we move out of the (biologically speaking) short time periods of history towards the longer time span of evolutionary theory. Humans are a biological species (*Homo sapiens sapiens*). Biological anthropology investigates the evolution of bipedal movement or that of the neocortex as a means of adaptation of hominids to changing environmental circumstances or sees it as a by-product of evolutionary developments that have to do with the way hominids undertook action for survival (such as hunting). In essence, biology sees the evolution of modern humans as the product of adaptation. Evolution functions by means of two processes: one is random mutation, changes in the genes of individuals within a species. Some of these mutations are beneficial for the individual, enabling it to produce more offspring than other individuals of the same species. The latter process is called selection. Mutations that offer an adaptive advantage will likely be the ones that are passed on to the following generations. Changes in the makeup of a species, its evolution, are thus explainable as successful adaptations to environmental circumstances. Culture as such, necessarily a product of evolution, is seen by some biologists as an adaptation. Cultural products are seen as extrasomatic evolutionary advantages. Such a functional model of culture is rejected by many, if not most historians. Evolutionary psychology, a field of study that emerged from earlier research called "socio-biology" goes even further. It tries to determine the adaptive significance of all human behavior, explaining choices of mates, upbringing of children and even altruism in terms of their contribution to survival. The discussion within biology has centered around the question of whether the genotype (the DNA of an individual) or the phenotype (the actual organism, the individual itself) are the unit of evolution. Whether culture itself is subject to evolution, remains a question of dispute.<sup>32</sup>

One of the main questions of interest to historians is how the interplay of culture and nature should be understood. The idea of a co-evolutionary development of culture and nature has been advocated. It offers a sound basis for theoretical considerations, as long as the autopoietic character of both systems is undisputed and culture does not become a mere extrasomatic

device of biological evolution, which would deny its own systemic development. The above mentioned considerations of Sietferle and Fischer-Kowalski offer such a perspective.<sup>33</sup>

Even if an empirical environmental history project can be undertaken without any such considerations, one needs to know the points of departure for the literature one uses. Environmental history keeps close ties with fields such as ecological anthropology, which can be adaptationist or reflexive and culture-bound, cultural ecology, political ecology and historical geography, which all differ in their basic concepts but implicitly or explicitly have their own takes on the evolutionary nature of culture.<sup>34</sup>

#### ACTORS' PERCEPTIONS OF NATURE, RISK AND PRUDENCE

Social theories play an important part in the writing of history.<sup>35</sup> In particular, theories linking the social and the environmental, 'socio-ecological' theories can be useful for environmental historians. If one is to write an environmental history, not only one's conceptual framework but also the concepts of nature of the actors one studies have to be considered. Usually, several different concepts of the intrinsic properties of nature exist in societies and also within one society. Groups within a given society differ (also) in the way they deal with nature, and those differences account for differences in perceptions of interactive situations, of action and evaluation. We can safely assume that societies in the past were not completely uniform in this respect either and can use the conceptual framework developed for modern society to ask in which ways they differed from it.

Dealing with nature as the 'other' of society is central to the makeup of social relations in general, as it is part of the social quest for creating order.<sup>36</sup> Cultural theory, a framework developed by cultural anthropologists, suggests people differentiate (for current societies) between four different concepts and patterns of behavior, called *individualist*, *egalitarian*, *hierarchist* and *jahalist*.

The concepts can be visualized as shown in Fig. 2.

*Hierarchists* conceive of society as being isomorphic to nature, like an image and its mirror. Environmental problems are understood as a perturbations of social order mirrored in nature. Polluted natural objects have to be brought back to an orderly condition, and if this is not possible, nature has to be changed to match the new social order. This can be done, as nature is repairable within limits. The repair mentality trusts in cultural, i.e. technical fixes: If acid rain changes lakes into acid, one can add lime to repair the problem. To solve an environmental problem, a hierarchist will establish and assign criteria, e.g. write up taxonomic lists of hazardous chemicals, detailing the correct handling, legal procedures and licensing of use.



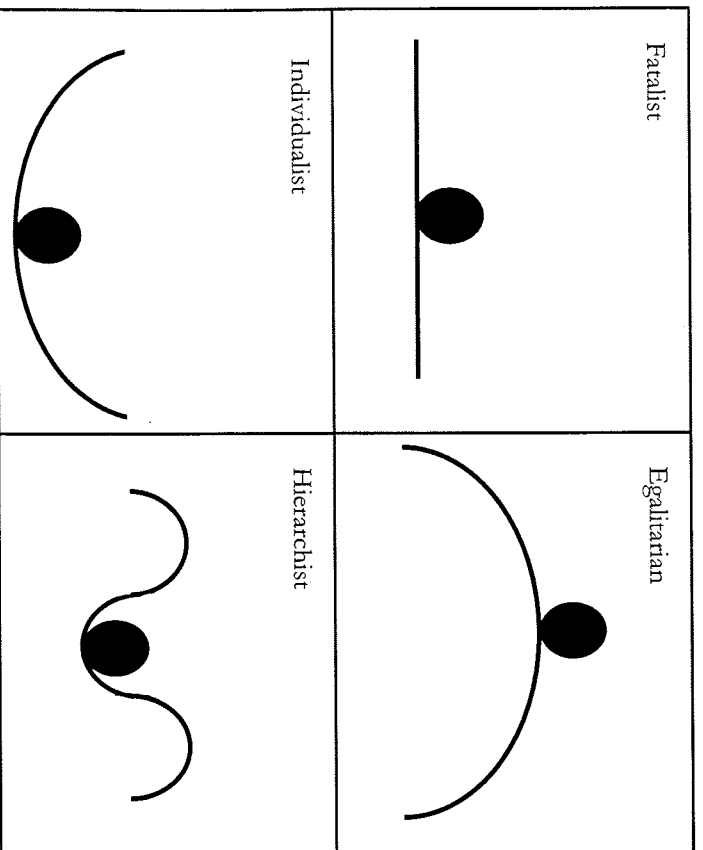


Fig. 2. Concepts of Nature: The black ball symbolizes nature. In the fatalist worldview, the state of nature is random. Egalitarians perceive of nature as being highly vulnerable, individualists perceive of nature as benign, rolling back to an equilibrium after disturbances. Hierarchists distinguish between a domain of benign and one of vulnerable nature, arguing for thresholds.

*Individualists* subscribe to the power of the invisible hand and hold that nature is benign and humans will, given the right incentives, co-operate with nature willingly. Costs involved in dealing with environmental problems will be dealt with by the market, an institution individualists conceive of as the most powerful force for order. Emission certificates and eco-labeling for those products that are safe are typical individualist solutions. Well-informed consumers will act as regulators in the market-driven system, which, if it is set free, will ultimately solve all problems.

*Egalitarians* believe that natural laws are rules which also apply to humans. Therefore, society needs to be changed in order to better adapt to nature. Sufficiency, abstinence from consumption, and minimizing interventions in nature are the rules that follow from the egalitarian world-view. Waste is a result of the social disorientation of consumer society and waste problems can only be solved by radically changing society.

#### APPROACHES TO ENVIRONMENTAL HISTORY

The three approaches, different as they may be, have something common, nevertheless. They all suppose that individuals have an ability to learn, and they fundamentally believe in the feasibility of change and order.

*Fatalists* are convinced that there is nothing to learn, but that there are many things one simply has to cope with, without being able to change them. *Fatalists* accept risks as inevitable. In environmental conflicts, they do not protest but comply, which means they are just as relevant for environmental policies as the other groups.<sup>37</sup>

How a society interacts with nature depends on four factors: Firstly or needs to know which of the above groups prevails at a given time, secondly which group(s) dominate in power relations, thirdly, how institutions deal with environmental issues, function, and fourthly the prevailing concept of risk and danger is of interest. In order to do research in environmental history, these four questions are of great help in defining structures.<sup>38</sup>

Peter Siefert and Ulrich Müller-Herold have developed a powerful model for the functioning of societies in terms of risk. They argue that each successful action undertaken in order to cope with a risk results in another type of risk. If one erects barns to cope with the vagaries of natural fluctuation of yields one ends up with the risk of mice and other vermin feasting on the stored goods, and in addition runs the risk of attracting other human groups which can profit from stealing the storage. This example is merely to highlight the principle and does not relate to a specific historic event. The overall effect is one of an accumulation of risk, a "spiral of risk" as the authors have termed it. The result of actions, however, will probably be interpreted by the group undertaking them in dealing with (and thus increasing risk, as a success.<sup>39</sup>

What kind of risk might there be involved in writing environmental history? Environmental historians willingly or implicitly draw conclusions from their research that inform environmental policy. 'Prudence' is the recommendation John McNeill gives at the end of his account of the twentieth century.<sup>40</sup> Prudence is certainly a very plausible conclusion to draw from the often paradoxical twists of history. As environmental historians we need to be aware of the potential political use of our results and conclusions (rather than of our research at large). Words like 'prudence' are unfortunately malleable and malleable enough to be used in political contexts as an argument against action. Environmental scientists over the years have had these kind of experiences all too often, and environmental historians are not in a better situation. The scholar and the activist parts of a person doing environmental history will not always easily come to terms.

## A ROOM WITH A VIEW: CONSTRUCTION AND CONSTRAINT

What do we see when we look at a tree? We see a material object, but also a cultural construction. Don Worster, eminent environmental historian and a man of great rhetorical skill, has voiced his anger with constructivist thinking: "If you think a tree is a cultural construction, hit your head against one." This quote can serve as a summary of the problems environmental historians have with constructivism. But we have to acknowledge that indeed, all we perceive is culturally influenced.

Cybernetics offers a solution. We need to formulate our histories from the viewpoint of an observer of second order, of someone who observes that she/he observes, and thus can acknowledge the limits of one's perception. We can know that we cannot see what we cannot see, and we also know that we will never see what we cannot see, in this case "nature as such". Therefore, we can acknowledge that a tree is culturally constructed and likewise an object beyond our imagination and control. We can devise experimental means to gather data about the tree (e.g. hit our head against it), and the results of those experiments will, although they are constructions made by us, deliver valuable knowledge for dealing with the tree.

If one reflects the constraints of one's own observation in writing, the reflective narrative offers a chance for the reader to re-evaluate it in the reader's own light, thus, enabling new constructions which are important because of their differences from the first one. As history always starts from the current set of paradigmatic knowledge available, it cannot ignore the concept of observation and in particular, observation of observers. The twentieth century has been called the 'century of the observer' by Dirk Baecker, a sociologist writing about Heinz von Foerster, one of the leading minds of cybernetics.<sup>41</sup> Now that the observer and his constraints<sup>42</sup> have become available as a conceptual tool, some historians have begun to consider historiography, the history of history, or, more generally the history of knowledge systems and knowledge production, as the only theoretically viable field of study. While research on the history of sciences has indeed deepened our understanding, and Foucault's considerations on the production of the idea of human complexity by means of the disciplines involved is especially fruitful for environmental historians,<sup>43</sup> empirical research other than on knowledge production should still be undertaken, bearing in mind that all we write is necessarily the subjective result of observations.

Cybernetics offers another valuable contribution to environmental history with the concept of self-organization or autopoiesis. Readers of this introduction have to be referred to the abundant literature on the subject. The main asset of the concept, however, can easily be explained: Narratives unfold as an interplay of causes and effects. In writing, one has to decide

whether something is a causal factor or an effect, and this can be quite impossible. In self-organized systems, effects can, and in fact will turn into causes changing the system along their way. Using these concepts, which is not yet common practice among environmental historians, non-linear, non-deterministic narratives can be written.<sup>44</sup> Incorporating cybernetics seems to be one of the most promising developments of the field.

But a lot is already there. If one wants to make sense of the things one sees when looking around, it is necessary to know where one stands. If one recognizes one's own assumptions and preconditions, the choice of a theme, a narrative and interpretations becomes less arbitrary and more reflexive. With environmental history maturing as a field of study and the literature, thus, becoming more and more abundant and sophisticated, the field becomes more attractive and more complex at the same time. This field guide aims at making knowledge accessible to newcomers by giving them what John McNeill once has called "a command of the obvious". The obvious in a field of study often is tacit knowledge, much as in a laboratory, and experience can only be accrued personally.

Writing history is one of the efforts societies undertake in order to observe themselves in all dimensions that seem relevant to them. Given the ecological challenges we face today, the environment has become a relevant dimension of historical thinking. Years of empirical work in all possible frameworks mentioned here will be needed to write a comprehensive environmental history of Europe. The field guide presented here offers an overview over conceptual frameworks that can be used for this empirical project.

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## NOTES

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## PEOPLE AND ANIMALS: THE ARCHAEOZOOLOGIST'S PERSPECTIVE

*László Bartosiewicz*

### INTRODUCTION

Perspective provides a way of regarding situations, facts, etc., and judging their relative importance. To the archaeozoologist, animals are of utmost significance, especially when viewed in connection with ourselves. This means that the specific aim of archaeozoology is studying the historical development of animal/human interactions on the basis of archaeological finds, predominantly animal remains.

In order to reconstruct medieval environments, archaeozoologists rely on bone finds as a primary source of information. From a technical point of view, *archaeozoology is the identification, analysis and interpretation of animal remains from archaeological sites*, that is, past cultural contexts.

In fact, the general definition of this field covers a complex discipline whose position varies depending on the definition of archaeology itself:

- in the Central European tradition (esp. German speaking territories), where archaeology was regarded a technical aspect of historical sciences, zoologists, paleontologists, veterinarians etc. have been trained in it as a form of applied zoology.
- in Western Europe and North America, where archaeology is usually regarded as a branch of cultural anthropology *late sensu*, it tends to be such anthropologists who are taught to analyze faunal remains as well.

Originally, archaeozoology was also aimed at reconstructing the fauna and natural environment from ancient settlements. In the study of *anthropogenic* deposits, however, human activity has always biased this picture. Therefore, regardless of the difference between these two scholarly dispositions, it would be very difficult to make viable statements concerning the historical development of animal/human interactions (and their scene, the human ecosystem) without a focused emphasis on the cultural element. In reality, the question of whether zoological or archaeological issues should be emphasized in archaeozoological research reflects the diverse functions of animals in human ecosystems, as well as the rich variability of information provided by animal remains from archaeological sites.<sup>1</sup> Archaeozoology, as practiced in Hungary (and, in fact, most of continental Europe) traditionally relies on a broad basis of empirical/scientific i.e. zoological data. It has been a widely accepted tool