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The Persistence of Positivism in Conservation Biology

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Introduction

Recent articles and comments in *Conservation Biology* have focused on theory and values in our discipline. We applaud the call by Barry and Oelschlaeger (1996) for the explicit acknowledgment and expression of values in the theory and practice of conservation biology, and we strongly concur with their call for the reversal of the trend toward a narrowly defined positivism in our discipline. In light of the commentary accompanying Barry and Oelschlaeger's article (*Conservation Biology* **10:** 904–920) and recent articles in *Conservation Biology* from Kay (1997) and With (1997), we wish to make two points.

First, values and valuations are an important part of conservation biology, affecting more than just the advocacy role conservation biologists play in public policy. Conservation biologists should explicitly acknowledge the importance of norms and values in their theoretical formulations, methods, and goals. Values form an integral part of our research, teaching, and community involvement; they can not be separated from our practice of science and relegated merely to shaping our advocacy responsibilities, such as lobbying.

Second, the trend toward positivism in conservation biology raises a number of difficulties beyond the dichotomy between facts and values. The positivist view of science has been substantially reworked by the philosophers who originally championed it. Every key tenet of this perspective has been either abandoned, liberalized to the point of triviality, or thoroughly undermined by positivism's own original practitioners. Conservation biology should employ a plurality of approaches in its studies to surmount these difficulties.

Facts, Values, and Advocacy

Conservation biology is *science in advocacy* for certain normative agendas. Most conservation biologists would agree that we are in the midst of an environmental crisis. In the wake of increasing human manipulation of nature, biodiversity is disappearing—nature is being reduced through human actions. Our perspectives toward our environment fuel an industrial civilization based on the exploitation and transformation of nature and society in the name of economic efficiency and higher production. Greater efficiency and production, whether planned or occurring haphazardly in the market, is used to justify and explain all kinds of change, including destruction of habitat and the reduction of local, regional, and global ecological complexity. We conservation biologists acknowledge that the means by which these detrimental changes take place are important, and we attend to the ways in which we can alter human practices or intercede in natural processes to foster certain improvements. Characterizing habitat loss and reduction of biodiversity as crises, asserting the intrinsic value of biodiversity, and acknowledging our responsibilities to effect positive change or prevent harm are normative judgments—reasoning about ends as well as means.

It is not possible to evaluate the problems facing us today through purely objective lenses. We cannot separate facts and values without sacrificing understanding and meaning. Ethics are a necessary component of these evaluations. Ethical inquiry does not involve a set of hard and fast rules or a list of social customs; rather, it is complex and contextual. When we think about ethics we focus on the values and norms by which people measure their lives and in which they find meaning. We ask how we (or others) should live, mindful of ends, means, and intentions (Midgley 1993). To approach problems in conservation biology we want practical knowledge that is ethically informed, something to help us solve disputes, take action, and change the world—not objective, valueless, uninterpreted facts.

Several of the commentators on Barry and Oelschlaeger's article attempted to maintain a fact-value distinction by claiming that values enter into science only when con-

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servation biology is engaged in advocacy (Maguire 1996; McCoy 1996; Meine & Meffe 1996). Relegating values in scientific pursuits to the domain of advocacy is consonant with Weber's discussion of values in science (Weber 1919, 1978). Weber distinguished between the disinterested scientist building empirically verifiable theory and the committed citizen using scientific knowledge to inform politics and policy. He maintained that while the internal affairs of science required value freedom, the external applications of science were value-relevant. Acknowledging that the scientist and the citizen are frequently one and the same, Weber noted that this produces some conflict between their respective roles but contended that the conflict is not insuperable (Weber 1919, 1978). Yet attempting to create two categories of actions, "fact finding" and "nonscientific advocacy," not only obscures the importance of the evaluative judgments that are unavoidably part of the entire scientific process but also limits the effectiveness of our advocacy. There can be no rigorous separation of facts and values, even in science. This separation is not possible for several reasons.

First, our understanding of the world differs according to our different philosophies of science. Positivism, empiricism, idealism, realism, hermeneutics—all have different takes on what constitutes theory, knowledge, truth, the contents of the universe, and what our values are or should be. Choosing one perspective shapes possible questions, appropriate methods, and acceptable answers and comes freighted with metaphysical assumptions about the world and interactions between people and nature (Worster 1977). We cannot authentically embrace any particular position without acknowledging our prejudices and adopting a particular perspective relative to others. Blind faith that quantitative methods will produce valid results in the absence of philosophical understanding is a kind of "methodism" (Gadamer 1993). Our choice of philosophy of science involves ethical dimensions concerning decisions about our sources of meaning and how we think the world is best understood.

Second, we embrace moral norms regarding professional conduct in how we perform research and communicate our findings. For example, we ought to treat our experimental subjects humanely and ought not falsify data or plagiarize one another. Generally, these norms include moral responsibility to ourselves, our colleagues, our professions, the public, the natural world, and our vision of the truth.

Third, based on both subjective and objective criteria, we make evaluative, ethical judgments concerning what is important, relevant, and urgent research. Our judgments take place in the context of academic tradition and geographical and historical settings. Science is shaped by public opinion, public policy, legal traditions, land and intellectual property rights, and funding availability.

Fourth, even the guiding metaphors we use in our model construction and scientific language—organic, mechanistic, economic, or systems theoretic—reflect assumptions we make about the nature of the world and reflect judgments on which we base our science.

Despite the important role that evaluative judgments play in scientific work, many choose to ignore or eschew the normative aspect of scientific practice. But, ignoring or eschewing ethics can lead to misunderstanding or mask ideologically motivated work. A good example of the latter is Kay's (1997) article. Citing arguments originally made by nineteenth-century social Darwinists, Kay claims, in an ideologically motivated and logically inconsistent manner, that ethics, politics, and religious beliefs are not important in problems of human population and disputes over resources because they are trumped by the "laws of evolution." He further asserts that ethical systems are defeated in guiding human action because some people cheat (i.e., do not abide by a single set of ethical norms). Kay consistently collapses important distinctions between human constructions and natural processes, subsuming all human actions, values, and beliefs under the constructs of evolution by natural selection. Indeed, he reduces economics, and by implication other disciplines, to "only a subdiscipline of human evolutionary ecology." Arguments that human social behavior is biologically determined or that humanity is "naturally" selfish are based on crude misinterpretations of the theories of evolution by natural selection and of sociobiology (Midgley 1995). These misinterpretations historically have often stemmed from a particular political agenda. Ultimately, Kay advances an ethical and political agenda reminiscent of social Darwinism while inconsistently claiming ethics and politics do not matter.

Prevalence of Positivism

Barry and Oelschlaeger (1996) define positivism as the belief that genuinely scientific discourse is value free. Positivism, however, is also a philosophy of science with a particular epistemology of verification, confirmation, and falsification; an objectivist foundation; and a commitment to realism and ethics. Defined either way, positivism creates problems in conservation biology when too narrowly applied, yet its traditions are so powerful that many are reluctant to embrace alternatives.

With's (1997) article concerning theory in conservation biology typifies the trend toward positivism. Implicit in the work of conservation biologists are shared normative agendas and overlapping ethical theories, yet these important elements are largely marginalized in With's article, relegated to a minor position of "values" and "attitudes" (e.g., in Table 1). Her categorizations restrict "rigorous" scientific activity to a narrow class of hypothetico-deductive, predictive models based on falsifiable hypotheses. With is, perhaps unintentionally, disciplining conservation biologists by limiting theory to a narrow

range of empiricist ecological theories and practices. Although much excellent work is based on this philosophy of science, it is only one way among many of conducting scientific study. Narrowing the range of our theoretical orientations limits insight and potential discoveries.

The problems with positivism have been elucidated in the last several decades through a reworking of positivism by positivists themselves. Manicas (1987) notes that all central elements of positivism have been substantially undermined, rejected, or reinterpreted to the point of irrelevancy by positivism's own philosophers. These changes include (1) abandoning the verifiability theory of truth that limited meaning to statements that could be empirically proved (Ayer 1936; Hempel 1950); (2) dissolution of the idea that verification, confirmation, and falsification are rule-determined and grounded in theory-neutral "basic sentences," thus opening the possibility of pluralism (Popper 1935; Feyerabend 1962; Kuhn 1962; Popper 1963; Lakatos & Musgrave 1970; Toulmin 1972); (3) liberalizing the covering law, deductive-nomological conceptions of explanation to include induction and more subjective meanings (Hempel & Oppenheim 1948; Hempel 1965); and, (4) admitting our inability to provide an adequate analysis of "laws of nature" (Chisholm 1946; Goodman 1954).

These rejections of the basic tenets of positivism by its own formulators are substantial and devastating. Manicas observes that no philosopher of science believes any longer in standard positivism in its entirety. Yet, because it is easy to pick and choose among its elements, it continues to be taken for granted as the basis of most popular and mainstream scientific discourse.

Whither Conservation Biology?

Conservation biologists form a unique discipline as we explicitly combine ecological and ethical theories; as scientists in advocacy of certain norms, we must make clear the positions we embrace. While positivism seeks to create a disjunction between fact and value, conservation biology creates its disciplinary territory by embodying a more holistic and interdisciplinary view of science and the role of the scientist. As conservationists and scientists we cannot separate our values from our research, nor should we try. Conservation biology is founded on ethical theories (Soulé 1985; Naess 1986; Barry & Oelschlaeger 1996). We do not do valueless, neutral science and then turn over facts to public policy makers who then make the moral decisions.

As Barry and Oelschlaeger (1996:906) cogently argue, "to deserve its title conservation biology must be ethically overt—that is, it must affirm its mission to be the protection of habitat and the preservation of biodiversity." But even with these clear statements on the primacy of values and the ethical foundations upon which our discipline stands, we conservation biologists hesitate to be advocates, to be true citizen scientists and publicly express our values in our science. We are so enmeshed in the beliefs of positivism and affected by the institutional structures of positivism that we often simply fail to notice its hold on our scholarship.

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