

O P I N I O N O P I O N

Opinion is intended to facilitate communication between reader and author and reader and reader. Comments, viewpoints or suggestions arising from published papers are welcome. Discussion and debate about important issues in ecology, e.g. theory or terminology, may also be included. Contributions should be as precise as possible and references should be kept to a minimum. A summary is not required.

On self-criticism in ecology

Jacob Weiner, Dept of Ecology, Royal Veterinary and Agricultural Univ., Rolighedsvej 21, DK-1958 Frederiksberg, Denmark (jawej5@staff.kvl.dk).

Lonnie Aarssen (1997) is troubled by ecology's tendency for self-criticism (e.g. Pielou 1981, Simberloff 1981, Woodward 1987, Hall 1988, Peters 1991), especially my own critique of much ecological research (Weiner 1995). Aarssen thinks that there is too much self-doubt in ecology, that we should just "let ecology loose", stop worrying about whether we are making progress, and "just do it". The large number of papers being published is evidence of ecology's progress, he argues. Aarssen's "don't worry, be happy" approach may make some ecologists feel good, but it is a bad prescription for ecological research.

The history of ecology does not support Aarssen's attitude. On the contrary, most of the major advances in ecology, whether Lindemann's "trophic-dynamic" studies, MacArthur's models, not to mention Darwin's theory of evolution itself, have been driven in part by strong dissatisfaction with the current state of the science at the time, not by the sort of complacency Aarssen espouses. The best science comes from a dissatisfaction with current understanding, leading to a strong desire to do better. Ecology will not be well served by a feeling of satisfaction with its achievements to date. That will keep us doing the same things we have been doing, rather than looking for the new ideas and methods that will advance ecological science. Indeed, the idea that "ecology is what ecologists do" may be a comfortable one for established ecologists. But comfort does not usually encourage progress in any endeavor. It is, rather, a prescription for mediocrity and stagnation.

In defense of his optimistic view of progress in ecological research, Aarssen argues that we don't need to restrict ourselves to a scientific definition of progress in ecology, because ecology, to paraphrase Aarssen, is more than a science. Unfortunately, this implies that ecology is also less than a science. Many of us are not

so willing as Aarssen (1997) and Fagerström (1987) to consign ecology to the humanities, alongside literary criticism, or even to the social sciences, with economics (which is a good example of what it means to be more than, and therefore less than, a science). Most ecologists want ecology to become more of a science, and this has been the goal of the criticisms of ecology by ecologists. Aarssen's and Fagerström's epistemology that puts aesthetics and beauty on a par with testability in evaluating theories inevitably leads to what I have called a "post-modern" view of ecology, where there is no truth, only "stories", and the choice of stories is a reflection of aesthetics and, ultimately, power. Influential, established researchers have no career interest in questioning the state of the science that they represent. They wouldn't want politicians or granting agencies to think that ecology is not a strong advanced science. But most researchers know that ecology is not yet a strong science, and I believe that Aarssen's philosophy will not help it to become stronger.

Aarssen likens ecology to a "curious and obstinate child, determined to sample and explore life on her own unconventional terms". The question he thus poses is how we are to raise our child. Aarssen's suggestion is that we just let her run wild. Most parents would say that some discipline is desirable in raising a child, as opposed to indulging every one of the child's desires. Follies of youth may be inevitable, but that does not mean they are to be encouraged. Among such scientifically youthful follies in ecology, I referred to the tendency, at one extreme of ecology, to collect huge amounts of descriptive data without a clear purpose, and, at the other extreme, to build abstract mathematical models that are untestable and irrelevant to ecological questions. To encourage the development of ecological, rather than mathematical, theory, I urged theoreticians themselves to consider whether a certain

line of work has the possibility of contributing to the generation of testable theories. (I did not advocate censorship by editors, as Aarssen implies.) If ecology is a curious and obstinate child, I would say that asking the child to consider the implications of her behavior is certainly not being too strict a parent. But saying "whatever you want to do is fine, sweetie" is rather too permissive.

The great Italian socialist Antonio Gramsci called for "pessimism of the mind, optimism of the spirit" in our efforts to improve the world through political action (Hoare and Nowell-Smith 1971). I think this is also a good prescription for ecological research. I applaud Aarssen's positive tone, but I do not think his "feel good" philosophy will benefit ecological research, or encourage much-needed innovation from our best researchers, among them Lonnie Aarssen himself. Self-criticism, the urge to do better, is one of the young science of ecology's greatest strengths. If this self-criticism makes us depressed and demoralized, then perhaps it could do more harm than good. But I believe that nature is so inspiring, and the desire to understand it so compelling, that we do not need to worry that the

dissatisfaction that can help motivate new ideas and approaches will somehow demoralize us. Ecology's tradition of skepticism and self-criticism is essential to its development as a science.

References

- Aarssen, L. W. 1997. On the progress of ecology. – *Oikos* 80: 177–178.
- Fagerström, T. 1987. On theory, data and mathematics in ecology. – *Oikos* 50: 258–261.
- Hall, C. A. S. 1988. An assessment of the historically most influential theoretical models used in ecology and the data provided in their support. – *Ecol. Model.* 43: 5–31.
- Hoare, Q. and Nowell-Smith, G. (eds) 1971. Selections from the prison notebooks of Antonio Gramsci. – Lawrence and Wishart, London.
- Peters, R. H. 1991. A critique for ecology. – Cambridge Univ. Press, Cambridge.
- Pielou, E. C. 1981. The usefulness of ecological models: a stock-taking. – *Q. Rev. Biol.* 56: 17–31.
- Simberloff, D. 1981. The sick science of ecology: symptoms, diagnosis and prescription. – *Eidema* 1: 49–54.
- Weiner, J. 1995. On the practice of ecology. – *J. Ecol.* 83: 153–158.
- Woodward, F. I. 1987. Plant ecology – trends and traits. – *Trends Ecol. Evol.* 2: 252–254.