

A bizarre and threatening process: the by-passing of ecological research when tackling environmental issues

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ABSTRACT

The environment is the loser in the distribution of the massive funds of the Commonwealth government's Natural Heritage Trust (NHT) that are targeted at non-scientific groups that claim to know both our environmental problems and their solutions. The beneficiaries of the NHT are hundreds of separate community groups across the country, most of which have neither the research and investigation skills to undertake the work in a manner that can assess whether their efforts on local environmental issues have been successful, nor the infrastructure to extrapolate general conclusions from their findings and apply them to a wider geographical region. The tragedy is that what should be a partnership has become a source of conflict. The aim in this chapter is to be provocative so we can fruitfully suggest positive ways of tackling the major environmental issues facing us all. In order to make any satisfactory progress towards a more sustainable future, we need to acknowledge the clashes of paradigms that exist in society and among community conservation groups and research-based conservation endeavours, and attempt to resolve them. One of the tools that helps us see the world more clearly and offers testable solutions for a better future is a scientific research model. All members of the Australian community who aspire to see our native fauna and flora survive intact for future generations will recognise the need for a research component to that vision. Without research, we are merely stumbling around in ignorance rather than learning from our past endeavours and conquering the problems.

The worst experimental design possible

The profile of science in society is that of a regular but minor subject of public policy and media attention. This is particularly true in relation to environmental issues such as the loss of biodiversity and climate change. The response of governments to these issues is of pivotal importance, and it is those who have the ear of government who are designing, whether they realise it or not, the greatest experiment of all time – the management of the future of the planet. Lamentably, the task is being conducted using the worst experimental design possible, one where there is no possibility of

replication and no controls. There is only one planet, after all, and the experiment of global economic growth is so far underway that it must be taken into consideration. Nevertheless, there is much that research scientists, and particularly ecologists, can contribute to take a methodological approach to the crucial matter of conserving our zoological heritage and Earth's life-support systems.

Planet Earth is both benefiting and suffering from the bountiful outpourings of scientific discovery. By the application of modern science, everyone reading this

page is likely to be leading a life made safer and healthier than those of their great grandparents. However, the very air we breathe is more polluted, and it is now threatening to change the climate. Water courses are becoming degraded or are disappearing; soils are becoming salinised. Native wildlife is declining across the globe, whether molluscs on a harbour rockface or flying-foxes in a coastal rainforest. While these are issues for the entire community at large, a primary task for scientists is to both correctly identify the issues involved and to put forward properly designed solutions. In spite of this, we have detected a bizarre and threatening process. The lack of scientific input to environmental management in the community-driven paradigm to solving our environmental problems is perpetuating a flawed ad hoc, piecemeal approach. There are influential, non-scientific groups within society that claim to know both the environmental problems that we face and their solutions. Such groups have the ear of government, and as a consequence the funds available to manage the environment are distributed directly to “the community” or, more exactly, the community as they define it.

The tragedy

That universities are being conspicuously starved of funds is a regular front-page news item. The hidden dimension of the news is the lack of financial support for research into Australia’s manifold environmental problems. Most projects initiated by community groups will fail the test of good science because the outcomes will be applicable neither within their own patch, since it is impossible to evaluate the success of a project unless it is undertaken scientifically, nor beyond the particular paddock or creek edge where the work was conducted.

So, we have a major issue to be resolved by all parties. That issue is how to properly appraise our environmental problems, how to decide priorities, how to be effective in finding solutions, and how to communicate both the problems and solutions. At the moment there is a clash between those taking a research approach to the problems of biodiversity loss and those who see the community as being the primary, or even the only, relevant player. This issue matters because a diminishing pool of funds is being increasingly directed to “the community” rather than to research. The tragedy is that what should be a partnership has become a source of anxiety and conflict. If you doubt this contention, then read the papers in this volume and the plenary discussion at the end of the day.

New ways of seeing and thinking

There are too few entertaining thinkers on the matter of how to think. In the opening page of his innovative *Atlas of Management Thinking*, de Bono (1981) pointed to the “peculiarity and wastefulness of the Western habit of argument and clash”. We wholeheartedly agree. If the clash continues we all lose. However, to pretend that a clash does not exist does not help in the resolution of the conflicts. de Bono suggested that “provocation” offers a way of generating new concepts and perceptions through lateral thinking. The aim of the forum, and in turn its publication here, was to be provocative in our examination of positive ways of tackling the major environmental issues facing all of us.

In what E.O. Wilson has described as a “hugely entertaining book, certain to create controversy”, John Horgan’s (1996) *The End of Science* looks at scientists from the perspective of an English graduate who spent his training dealing in irony and criticism, the only truth in this discipline being that of the original text itself. Science, says Horgan, more than any other mode of knowledge – literary criticism, philosophy, art, religion – yields durable insights into the nature of things. He goes on to say that the greatest scientists want, above all, to discover truths about nature (in addition to acquiring glory, grants and tenure, not to mention improving the lot of humankind); they want to know. He adds that such scientists are often accused of being arrogant, and some are, but more importantly, he stresses that the scientific enterprise is being threatened by technophobes, animal-rights activists, religious fundamentalists and, most importantly, stingy politicians. We can only smile wryly when we recognise the applicability of his American conclusions to Australia, and their relevance to the debate at hand. Having read the arguments in this volume, do you consider that some community groups and their political supporters could be added to that list of threats to the scientific enterprise? Now let’s turn to the community.

What is a community?

The concept of “community” is straightforward at first glance, but for environmental issues, what does it mean? In the context of this chapter, and this publication, it means a local citizen group concerned with a local environmental matter, a single-issue environmental group, or a group with broader remit than environmental matters, such

as a local council or a catchment management board, yet one that seeks funds or other support to address an environmental problem within a contained geographical area. A key element of a community group is that the issues they tackle, or give priority to, are the ones that they identify. Arguably these are not the best approaches to the long-term management of even local species or their habitats, let alone the major environmental threatening processes.

Environment Australia has published a series of environmental indicator reports for Australian state of the environment reporting. One of these was *Environmental Indicators for National State of the Environment Reporting - Local and Community uses* (Alexandra *et al.* 1998). The term “community” was not defined, but in Table 10 the authors assess community environmental monitoring groups they call CEMs, listing three significant points: that “community monitoring is not systematic” and is “highly variable in terms of accuracy and duration”; that CEMs need “agency support” and “links to management”; and that the most successful groups have “coordinated offices and researched and agreed monitoring schemes”. When Birds Australia is listed as a CEM it becomes evident that it is a scientifically sophisticated group, which publishes a scientific journal with an international reputation, and not the more usual profile of a CEM.

Alexandra *et al.* (1998) pointed out that it is the larger, coordinated monitoring networks, such as Birds Australia and Waterwatch, that are closest to meeting the needs of resource managers for data consistency, coverage and communication. In Table 11, they identify some of the typical characteristics of CEM groups and networks. Under column 1, Individuals and single CEMs, the following points are made: “usually have a local focus of interest”, “communicate findings to limited circle”, and “have ad hoc technical support”. By contrast, as shown in column 2, State/Territory and national community environmental monitoring networks were found to “act locally, but are networked regionally and nationally”, “apply standard methods”, and “provide regular theory and practice sessions”. This clearly shows that those CEM groups that utilise a research model are making the best contribution to natural heritage restoration. How do you read it? Enter the discussion. Now let’s throw the spotlight back on the scientists.

What is scientific research?

You might fairly ask, “what is scientific research?” One can look for some time to find a text on the subject that is scholarly, yet not written by a scientist. One such text is by Bunge (1967) who, as a philosopher, produced a text for science and philosophy students. If problems can be worked out in the free and disinterested spirit of pure science, the solutions may be applied to practical ends. Thus practical problems are the source, along with intellectual curiosity, of scientific problems. Technology often follows in the wake of pure research, with a decreasing time lag between the two. Practical problems, such as the massive environmental problems identified in the first ever state of the environment report by the national government (Commonwealth of Australia 1996), have become a driver for moving into the scientific problem stage. Unfortunately, many politicians and community groups have by-passed the scientific research stage and gone directly to what they see as the solutions. Here, Bunge has some relevant observations.

Curiosity and freedom of research, the freedom to doubt received ideas and try new ones, are vital goals of science. If they are trampled on or by-passed, the immediate result is the languishing of pure science followed by the stagnation of technology. The practical policy, says Bunge, is to abstain from making practical demands on pure science. It is our view that only the most short-sighted community groups would argue that we have all the answers to our environmental problems. We need technological advances, we need applied solutions, thus we need pure research. Community groups have much to contribute but not, we contend, at the expense of scientific research or a downgrading of the role of research as currently appears to be happening in environmental matters. The question inevitably arises as to what are the essential elements of research.

The primary target of research, argues Bunge, is the advancement of knowledge, including applied problems such as the impact of an oil spill on the seashore or the effect of a bushfire on wildlife. The goal is the seeking of facts, but it is not just the mapping of facts. Recording facts about a particular thing is too exhausting and plain uninteresting; description itself will miss the essential elements of a system; it will have no predictive power nor explain how things happened. It is theories, not catalogues of fact, that underpin understanding. Factual science

aims to map patterns, and to give a conceptual reconstruction of the pattern. It can then interpret the past and predict the future. Scientific research then is the search for patterns and the processes that create them.

Science does not claim to be true, but it can legitimately claim to be truer than non-scientific speculation. It is also able to test a claim, discover any shortcomings and correct them. It achieves this goal by its method, in contrast to non-scientific speculations which are untestable and give rise to no new problems as their point is to end enquiry with a ready-made set of answers. Scientific research does not seek a single final complete truth; it is continuously engaged in the process of reconstructing the world with ideas and testing every partial reconstruction. The unity of science does not lie, says Bunge, in finding a single, all-embracing theory, nor in a unified language, but in its singleness of approach – the ceaseless testing of its theories and its techniques. Does that close the debate? Not at all. Let us consider another aspect not yet covered and in which both scientists and non-scientists play a major role.

The environmental debate is steeped in ideology

Writing from an aptly titled Department of Interdisciplinary Studies, Francis Sandbach (1980) delineated various schools of thought that influence environmental policy. Sandbach is of the opinion that many of the views expressed in the environmental debate appear to be based on scientific evidence, but closer inspection shows them to be steeped in ideology. The conclusion he draws is that it is not really possible to isolate environmental problems from the social, economic and political organisations of the societies in which they arise. From that general observation it is then possible to assess how different groups in Australia use science, how they respond to such social issues as jobs, their stand on development versus conservation, their opinion of a private landowner's development rights, and how political decisions about the environment are, and should be, made.

Exports of uranium and woodchips, the harvesting of kangaroos, the right to drive a 4-wheel vehicle on a public beach and the appropriate means of allocating and auditing of public money to community conservation groups are all areas which have a social, economic or political element that goes beyond the role of science in

environmental matters. However, because there is a scientific dimension we take the view that any claims to be scientific need to be examined. Most importantly, we assert that the definition of an environmental problem, its origins and the future state of the environment, need a research strand.

Charles Birch looks at the future and finds it confronting

Charles Birch's spiritual quest has freed him from a worldly pursuit of material wealth, and so he is not mesmerised by the wonders of economic growth. He spent the early part of his professional life as a practical zoologist carrying out research on pest insects. One of his major conclusions was that the weather has important effects on the distribution and abundance of animals. His ecological outlook, combined with a wonder about life, allowed him to examine our environmental future. What he saw shocked him, and his vision of the task ahead was one of confrontation. The real Horsemen of the Apocalypse he identified were the destruction of Earth's life-support systems, poverty, disease and ignorance. Birch did not use weather terms, but we can paraphrase him as forecasting violent political storms with the likely outcome being drought for most of the world and a lush but short-term future for a few. The social equity involved in the distribution of our biological wealth Birch identified as being so skewed as to produce abundance for some but misery for most. This is evident from the preface to the second edition to his book (Birch 1993).

What is most important is Birch's observation that since the first edition of his book in 1976 the world had changed dramatically such that environmental concerns have become central issues for government, and the global nature of pollution has become a reality for everyone. He notes that the Australian government has produced massive reports on ecologically sustainable development, but as yet nothing has been done to implement the many recommendations. Birch also notes that some things have not changed. The first of the two important matters to remain unchanged is the goal of every nation to increase its economic growth in material goods. Birch sees this as the road to collapse. The second matter is the rich-poor gap across the world, where the poverty of two-thirds of the world is as threatening as nuclear weapons were in previous decades. To Birch, confronting the future entails asking the questions of how to restore ecological sustainability and how to redress the

present injustice between the rich and poor worlds. To say that Birch had identified clashes in paradigms would not be overstating his case.

Conclusion

The forum, this book and this chapter have been directed to confronting the obstacles to facing the future. One obstacle has been the rejection of the vital contribution of scientific research in the assessment and resolution of our environmental problems. There are clashes of paradigms within Australian society as to how to see the future and what path to follow. Birch's rich-poor gap and the road to environmental ruin via economic growth are two that stare us in the face. That there are community groups reflecting these clashes is to be expected. What by-passing a research approach represents is sustaining one of the four horsemen of the apocalypse – ignorance. Arriving at solutions without involving a research component produces no lasting gains and as such is a gross waste of scarce resources.

Generating a vision of the world, and of Australia in particular, that has come to grips with our massive and growing environmental problems is a daunting task. One of the tools that will help us see the world more clearly and offer testable solutions for a better future is the application of the scientific research model. The world community cannot hope for a sustainable world without it. All members of the Australian community who aspire to see our native fauna and flora survive intact for future generations will recognise the need for a research component to that vision. To prevent us being deluded that we are making satisfactory progress towards a more sustainable future, we need to acknowledge the clashes of paradigms that exist in society, including that between community conservation groups and research-based conservation endeavours, and attempt to resolve them. If you share this vision then there is plenty of work ahead for all of us, community groups and research scientists alike.

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