

Guest editorial

A case for structured international research in Antarctic ecology

In Antarctica polar conditions of real cold, desiccation and salinity extremes lie away from the sea edge. Here, where there is sufficient moisture for life to be found at all it is invariably dominated by cyanobacteria, sometimes in a profusion unmatched elsewhere in the world. Now that much of the descriptive ecology and physiology is completed where should ecology be going? There are two possibilities: 1) an ecosystem approach to the functioning of Antarctic inland areas; 2) a molecular approach to the genetic controls on survival in cold, saline and desiccated conditions.

My comments below are largely directed to the first of these but they may equally apply to the second which is already an expanding realm of international science that needs to be fitted in to the Antarctic 'science structure'. What is this structure?

D.W.H. Walton (*Antarctic Science* Editorial, 6, 293, 1994) pointed out the political and practical constraints on sharing stations in the Antarctic. Each country has established very different systems for funding research, organizing logistics and choosing which science projects to support. Yet to progress to larger scale projects at an ecosystem level will require close international co-ordination at the science planning, execution and logistics levels. Two potential ecosystem studies spring to mind: the McMurdo Ice Shelf and the McMurdo Dry Valleys. In 1987, New Zealand began an ecosystem oriented programme on the McMurdo Ice Shelf, a 1500 km² area of ponds, lakes and streams on floating dirt-covered ice in what is Antarctica's largest 'wetland' and surely one of the most bizarre ecosystems on Earth. Although the research results, from scientists from several nations, have been published, this programme did not have a long-term perspective. In 1993 the US initiated the 'Dry Valleys Long Term Ecological Research Programme' centred on the Taylor Valley. The National Science Foundation wishes to foster international participation in this. The advantages of joining such a programme are considerable, especially for groups that do not have access to large resources. How can this be encouraged?

Our only international science forum encompassing all Antarctic nations is SCAR. Perhaps SCAR could be the vehicle for persuading national programmes to encourage international participation? For instance SCAR could request national programmes and funding agencies to:

- offer a certain number of places for foreign scientists on approved projects:
- stress that it would be easier to obtain funding for projects that are internationally based
- set aside a proportion of funds for international collaborative projects (the Italians have done this)
- advertise opportunities in programmes that could be filled by international scientists
- negotiate a system for payment where necessary to spread the costs.

Earth sciences, marine sciences and meteorology already have such collaborative projects. This I believe is the way forward in environmental science, and an important means to minimize duplication and poor quality science. It is also the only way in which the sticky problems of control, investment, responsibility and choice in Antarctic research which were raised by Walton (1994) can be resolved. Ecologists need to get their act together now. SCAR could help to ensure that for good ideas the climate is right and the opportunities are maximized.

Meanwhile—the cyanobacteria wait. After all they have been around for several hundred million years. A comprehensive in-depth study of their polar environment will require human collaboration. Let us hope it does not wait too long.

CLIVE HOWARD-WILLIAMS

National Institute of Water & Atmospheric Research Ltd.