

Fifty Years of Invasion Ecology: The Legacy of Charles Elton

Between 12 and 14 November 2008, The Centre for Invasion Biology hosted some of the World's top invasion scientists at its international symposium entitled '*Fifty Years of Invasion Ecology – The Legacy of Charles Elton*'. British ecologist Charles Elton (1900-1991) was by no means the first author to write about non-indigenous species displaying invasive tendencies. Several pioneering naturalists of the 19th century, notably Charles Darwin, Alphonse de Candolle, Joseph Hooker and Charles Lyell, mentioned invasive species in their writings. In the first half of the 20th century, Joseph Grinnell, Frank Egler, Herbert Baker, Carl Huffaker and other ecologists also published important contributions on introduced species. However, Charles Elton's 1958 book "*The Ecology of Invasions by Animals and Plants*" is widely recognized as the starting point for focused scientific attention on biological invasions. Hence, 2008 has seen much activity celebrating the 50th anniversary of the book's publication.



Keynote speakers at the symposium were (back row): Dan Simberloff, Tim Blackburn, David Richardson, Peter Vitousek, Philip Hulme, Mark Davis, Mike Wingfield, Steven Chown; (front row): Anthony Ricciardi, Andrew Lowe, Petr Pyšek, James Carlton, Matthew Chew. Absent: Guy Preston

The meeting provided plenty of opportunity for discussion between local and international researchers, managers and students by pairing keynote addresses with question and answer sessions, and by including extended poster discussions and focused discussion groups. Keynote speakers covered a wide range of ground, from the history of the field and the

extent to which Charles Elton set the scene for the work (talks by Dan Simberloff, Matthew Chew, David Richardson), to the difficulty that many fields have with laying to rest hypotheses that have been repeatedly rejected (Mark Davis), and to large scale regularities in patterns of introduction and invasion (James Carlton, Tim Blackburn). The importance of including both ecological and evolutionary perspectives in the field was also highlighted (Andrew Lowe, Steven Chown), as were novel approaches to invasions in different systems (Hugh MacIsaac, Anthony Ricciardi), and the importance of microorganisms as invasive species (Mike Wingfield).



Invasive alien species management discussion group at the Symposium (back row): Steven Chown (CIB), Michael Kawa (WfW), Brendan Mashabane (WfW), Vusi Lubisi (WfW), Michael Wingfield (FABI); (front row): Carlo de Kock (SANParks), Cedric Singo (WfW), Mase Moshotlwa (WfW), Concience Sambo (WfW), Linda Mabuzza (WfW)

New technologies for understanding the ecosystem consequences of invasions, and how nutrient dynamics in particular can be investigated at spatial scales much larger than previously manageable were highlighted by Peter Vitousek. The benefits of collaborative approaches for assembling spatially and temporally explicit, high resolution information on introduced species and those that become invasive were highlighted by Petr Pyšek, who used the outcomes of the amazing European DAISIE and ALARM collaborative programmes to illustrate how much additional understanding can be gained from such coordinated, joint work. The significance of the research being undertaken for biosecurity, and the extent to which biosecurity matters are being addressed by research were explored in a discussion session led by Philip Hulme.

A second management-orientated discussion explored the major challenges being faced in South Africa by managers from the Working for Water Programme, CapeNature and SANParks, who also participated in additional capacity building sessions associated with the symposium. These sessions complemented the excellent overview of the aims, challenges and success of the Working for Water Programme presented by Guy Preston.

The meeting was attended by 136 delegates from 12 countries and provided a forum for scientists and managers to interact. Enthusiastic and thoughtful participation from all involved means that several additional products will emerge from the meeting as fitting testimony to the legacy of Charles Elton. Generous support was provided by Stellenbosch University, the National Research Foundation, The Oppenheimer Memorial Trust, Durbanville Hills Winery, Delheim Estate, Paul Cluver Wines, Cloof Wines, Wiley-Blackwell, Oxford University Press and Springer.



The image above depicts artist Lorraine Blumer's impression of what Elton envisaged as he wrote: "If we were to build six great tanks, fill them with water and connect them all to each other by narrow tubing blocked by taps; then fill these tanks with different mixtures of a hundred thousand different chemical substances in solution; then turn on each tap for a minute each day; the substances would slowly diffuse from one tank to another. If the tubes were narrow and thousands of miles long, the process would be very slow. It might take quite a long time before the system came into final equilibrium, and when this happened a great many of the substances would have been recombined and, as specific compounds, disappeared from the mixture, with new ones from other tanks taking their places. The tanks are the continents, the tubes represent human transport along lines of commerce....". (Artwork © Centre for Invasion Biology)