

New Zealand Association of Scientists 2001 Awards

This year, the Association's awards ceremony was held in Wellington on 18th October. In conjunction with the Foundation for Research, Science and Technology and the Association of Crown Research Institutes, the Association presented awards to scientists and science communicators for outstanding contributions to science, and excellence in promoting an understanding of science among the general public.

Three medals were awarded to scientists: The Marsden Medal for service to science, the Shorland Medal in recognition of a lifetime contribution to research, and the Research Medal for outstanding research work by a young scientist.

A Science Journalism Prize of \$1500, sponsored by the Association of Crown Research Institutes, was given for outstanding science journalism, together with two Merit Prizes of \$350.

Three Science Communicator Awards of \$1200, sponsored by the Foundation for Research, Science and Technology were given. Two are offered to working scientists for communications concerning scientific issues of public interest, and for communications that encourage an appreciation of the principles of science among the public. The third award is offered, for excellence and commitment in promoting science, to freelance writers, science communicators and public relations practitioners.

Marsden Medal

The Marsden Medal is given to recognise outstanding services to science and the cause or profession of science. Dr Ian Speden, of the Institute of Geological and Nuclear Sciences, was awarded the 2001 Marsden Medal for his service both to earth sciences, and science in general.



Dr Speden has made a specialist contribution to knowledge of New Zealand fossils of age 65-250 million years and interpretation of the sedimentary strata in which they are found. His work on the East Coast led to a better understanding of the regional geology and of continental drift during the Cretaceous period. This was recognised by the award of the prestigious McKay Hammer for 1975-76, and subsequent Fellowship of the Royal Society of New Zealand.

His long-term interest in applying geology to practical problems led to many interdisciplinary studies of erosion, land-use planning and sustainability as well as natural hazard identification. This resulted in 110 published papers and

maps. Publications such as "Land Alone Endures" and "Natural Hazards of New Zealand" were seminal in developing ideas ultimately expressed in the Resource Management Act. Dr Speden's interests extend to other areas, and his direct, well-reasoned opinions shaped the course of work in areas removed from his primary expertise - for example in petroleum exploration and coal geology.

His growing reputation attracted a number of students, and he was a mentor and de facto supervisor to a number of Auckland University MSc and PhD students. There could have been no better model for and aspiring geologist to follow: Dr Speden has always preferred a team approach to that of an isolated scientist.

He was appointed Director of the New Zealand Geological Survey in late 1984 to which later was added the Geophysics Division. His style was vigorous and enthusiastic and led to many innovations. The last days of DSIR were a trying environment with reduced funding and redundancy rounds but his skilled handling ensured the survival of most of the vital core capability.

Dr Speden has been involved in a number of external organisations and interdisciplinary working groups both nationally and internationally. He has been president of the Geological Society of New Zealand, served on the Ross Dependency Research Committee, contributed to the work of the Royal Society both as a councillor and Honorary Treasurer. He is still vice president of the International Union of Geological Sciences.

After graduating MSc from the University of Otago with first class honours, Dr Speden joined the New Zealand Geological Survey, D.S.I.R. He went on to obtain a PhD from Yale University in 1965, later returning to the New Zealand Geological Survey. He retired in 1994 from the Institute of Geological and Nuclear Sciences but is continuing his work there as a research associate and mentor.

Shorland Medal

Professor Brian Halton, of the School of Chemical and Physical Sciences, Victoria University of Wellington, was awarded the 2001 Shorland Medal in recognition of an outstanding personal lifetime contribution to research in chemistry. The studies are on man made molecules, in particular 'strained' organic compounds — fascinating and potentially valuable materials that do not exist in nature.



Normal rules of chemical bonding and geometry can be pushed to the limit by strain as the chemist tries to make

compounds with interesting and often unpredictable properties.

Most stable molecules have geometries that optimise bond angles and lengths to minimise the total energy. But in a strained organic molecule the bond lengths and/or angles are very different from the norm and this gives high internal energy.

Such molecules can be likened to coiled springs as ready to be released as a 'Jack-in-a-Box'. Since strained molecules have 'high-energy properties' they are generally very reactive and their synthesis is often extremely challenging. Such compounds are of major scientific interest because they help us understand the ultimate possibilities in organic chemistry. Some compounds are, however, of economic importance.

Professor Halton has directed his efforts at what was a poorly understood class of compounds. This combines the stability and symmetry of benzene with the reactivity and distortion of the smallest and most highly strained three-membered ring compound, cyclopropene, to form the cycloproparenes. This work has led to some 110 of his 140 published works in the international peer-reviewed chemistry literature.

Many of the molecules are beautifully coloured, crystalline solids with a stability unusual for such highly strained molecules. Serendipity led Professor Halton to an exceptionally fluorescent derivative with possible uses as a laser dye or in the "new materials" area of organic chemistry. Such was the importance of his discovery that much recent international effort has been directed at the development of new organic materials of this type and a new class of dyes has already resulted.

Professor Halton's elegant work is often carried out in collaboration with leading international research groups using equipment and instrumentation not available locally. Joint publications with groups from Australia, Canada, Germany, Israel, the UK, the USA and (the former) Yugoslavia, is providing further international recognition of New Zealand science.

He was appointed lecturer in organic chemistry in 1968. In 1991 he was awarded a personal chair, and the following year was elected to the fellowship of the Royal Society of New Zealand.

Research Medal

The Association's Research Medal for 2001 was awarded to Dr Robert Poulin of the Zoology Department, University of Otago, for his outstanding contribution to understanding in the area of evolutionary ecology of parasites.



The medal is awarded each year to a scientist aged under 40 for outstanding research work, principally undertaken in New Zealand during the three preceding years.

Close to half of the known species of living organisms on the planet can be classified as parasites, and yet we know little about the evolution of parasites and other disease-causing organisms. Dr Poulin's work has helped to answer questions such as why certain animal species are host to more parasite species than others, or what produces geographic variation in the number of species of parasites.

Because this work identifies features of hosts or their environments that promote their transmission and persistence of disease, it has important implication for understanding the incidence and transmission of parasitic diseases.

Dr Poulin's research has highlighted the intriguing ways in which parasites manipulate the behaviour of their hosts. Many parasitic species take control of their host's actions in ways that ensure their own transmission to other hosts. He has provided the first theoretical analysis of the evolution of this phenomenon, as well as some of the best evidence.

His work has also shown how these manipulative parasites attract other opportunistic parasite species, resulting in multiple infections for the host. Furthermore he has shown how manipulative parasites can influence the ecology and evolution of their hosts, with major repercussions for ecosystems.

A good example of the work done by Dr Poulin and his colleagues involved cockles. It showed that a parasitic worm in New Zealand cockles stunts the growth of the cockle's foot - the large muscular organ that cockles use to burrow under sediments. Heavily infected cockles are incapable of burrowing with their ridiculously small foot and become more vulnerable to oystercatchers. This benefits the parasitic worms inside the cockles, because they must reach the intestine of the birds to complete their development.

An important consequence of parasitism in this case, however, is that cockles lying at the surface of the sediments provide the only hard surface on which limpets and sea anemones can attach on mudflats. Without the presence of parasites in cockles, the co-existence of limpets and sea anemones in these habitats would be impossible. This pioneering work was the first to demonstrate the positive effects of parasitism at the ecosystem level. It is currently the basis of a Marsden-funded research programme.

Dr Poulin has made important contributions to several areas of ecological parasitology that have resulted in numerous publications in respected international journals. He was educated in Canada where he completed a PhD at the Université Laval, Quebec City. He joined the Zoology Department at the University of Otago in 1992. He is the sole author of a book, *Evolutionary Ecology of Parasites*, published in 1998.

Science Journalism Award



The Science Journalism Prize was awarded to Radio NZ personality Kim Hill. Her interviews with New Zealand's Nobel Prize Winner Alan McDiarmid, Nobel Laureate Maurice Wilkins, and her fascinating interview with Professor Brian Wynne covering "science in society", have been characterised as worthy of placement in historical archives. The person, the issues and the science were drawn out through the interviews, and the contributions displayed radio feature presentation at its best.

Merit award winners were Lisa Glass of TVNZ and Anne Beston of the New Zealand Herald. TVNZ's Assignment programme contributed excellent features involving interviews at home and abroad that sought to portray a field of health science in everyday terms. It succeeded admirably. Lisa Glass brought flair, imagination and almost "new life" to science reporting on news programmes when given the opportunity. Anne Beston of the New Zealand Herald deserves commendation for her high quality, consistent presentation of science that matched the needs of a daily newspaper.



Science Communicator Awards

The award to a practising scientist for communications concerning scientific issues of public interest was won by Chris De Freitas of the Department of Geography at the University of Auckland, Tamaki Campus. His contribution covered a variety of

topical issues relating to global warming, and showed outstanding skill in expressing large concepts in an easily understood format, which he presented in a range of media – print, radio, TV, and presentations. Dr. de Freitas takes large and complex issues of concern to the public and provides a scientifically sound and an understandable discussion.

The award for communications concerning principles, achievements and methods of science was won by Graham Shepherd of Landcare Research, Palmerston North for his work in communicating the methods of soil management, and in particular, visual soil assessment. Mr. Shepherd has put together a comprehensive portfolio, and presented to a wide range of audiences with an interest in soil management. His work offers a new approach to the subject, and he has converted a technically complex subject into a workable tool for 'hands-on' practitioners.



The Freelance Writers and Professional Science Communicators Award was won again this year by Caroline Cook of Dunedin, for her work as Director of the International Festival of Environmental Science and Technology and The Auckland Regional Science Festival. Her commitment, in communicating and promoting science and technology to the general public in both of these events, made a wide variety of science accessible and

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