

### Associate Professor Jack Greenwood

Jack Greenwood was born in Te Kuiti New Zealand in 1937, and attended schools in Gate Pa, Tauranga, Mt Maunganui and Hamilton before undertaking tertiary studies at what was then the Auckland campus of the University of New Zealand, from which he graduated with MSc(Hons) based on research hermit crab biology. In 1961 he, with his new wife (Joan), moved to Brisbane to take up a one-year appointment as Senior Demonstrator in Zoology at the University of Queensland. At the end of that year he accepted the offer of a lectureship in the Zoology Department, where he completed a PhD study on zooplankton, and where he has remained throughout his career. His promotion of marine sciences at the University of Queensland resulted in the 1991 formation of a School of Marine Sciences, of which he became founding Director and remained so until its evolution to a Centre for Marine Studies in 1999. He has published 120+ scientific papers on crustacean biology, zooplankton and estuarine ecology, with collaborators in Australia, New Zealand, USA, UK and South Africa.



### **AMSA 2000 Jubilee Address**

Jack opened his address by saying he wished to comment on his experiences in the three areas of being a university academic: research, administration and teaching. His address commenced with a brief overview of the types of research he has undertaken, then focused on the importance of an often overlooked group of zooplankters, the demersal zooplankton. These organisms typically spend daylight hours on, in, or associated with the substratum, and move into the water-column during darkness. Because many plankton studies in coastal waters are based on daytime sampling, this diverse and abundant demersal component is often ignored. Drawing upon studies made with several co-authors Jack demonstrated the abundance and behavioural patterns of demersal zooplankters, their importance in mediating nutrient flux across the sediment/ water interface, the almost exclusive reliance of juveniles of many estuarine fish upon these organisms for food, and the threats posed to the demersal zooplankton, and hence estuarine ecology generally, through anthropogenic impacts such as the secondary effects of spraying estuarine margins with various agents for mosquito control.

**Time constraints allowed Jack to make only brief comment on trends in biological education in Australian Universities. The text prepared for that portion of his address is presented here in full:**

During my 40+ years in the University system there have been many changes in biological education, most of them being for the good, and including the growth of whole new areas of biology. There are however some areas which are of concern, and which impact on marine ecology.

When I was a student in the late 1950's, knowledge of cells had not progressed far beyond that known to Antoni van Leeuwenhoek in the 17th C, who was the first person to describe living cells, or Rudolph Virchow who, in the mid 18th C, established that cells are the basic units of structure, growth and reproduction. Genetics had scarcely proceeded beyond the Mendelian stage, and although there was knowledge of the chemistry of DNA, the Watson and Crick model of DNA

architecture and replication was not yet into the textbooks. Subsequently of course, developments in both these fields have burgeoned, and revolutionized approaches to biology, medicine, and many old and new technologies. Similarly there have been major advances in our understanding of the physiology of organisms and its impact on their ecology, and in the development of quantitative approaches to ecology.

A consequence of such knowledge-growth is the major dilemma, faced by students, their teachers, and the University system in general, of how to pass on all this new knowledge and understanding, together with the old, within the framework of our degree structures. It basically comes down to the old questions we all face at varying levels in life, of whether to specialize or not, and if so, in which direction(s) and when?

For Universities, this has contributed to a painful set of processes which may not be familiar to you all.

Up until the mid 1970's, situations were relatively stable in the 15 or so Universities that then existed in Australia. Extensions of knowledge and understanding were progressively incorporated into the same set of slowly evolving, big, undergraduate subjects. But in the mid 1970's events happening elsewhere in the world reached Australia, and students protested not only about their lack of say in University affairs, but also about their need for freedom of choice within study fields.

Large inclusive subjects (e.g. 3rd Year Zoology) became split into component parts, and a wide range of specialized subjects was offered both to allow student choice, and to cater for the knowledge explosion. Individually tailored degree structures were possible, and final-year subjects kept up with advances in knowledge and were usually taught by specialists. Similarly, the various Universities developed their own specialties, and research emphases and recruitment to postgraduate studies reflected this through what could be called academic 'genetic' drift, diversity and natural selection. A healthy situation for the fostering of advances.

But the situation changed radically through the 1990's and, paradoxically, we now function within what to me is a system that in the face of continued rapid growth in knowledge, has decided to produce generations of generalists.

The prevailing current philosophy is that if a subject is worth teaching, all students should be able to include it within their degree program, whatever their interests, and that there have been too many small specialist subjects for this to be possible. The pendulum has swung, or the Watson-Crick spiral turned. At the same time there has been the controversial rapid expansion in the number of universities to approx 40, beyond the capacity of governments and taxpayers to support, with consequent financial strictures and the conversion of universities into commercial businesses in which students are now known as 'clients'. Universities now scarcely make even a pretence of democracy in their planning and management, and the essential drive for financial stability.

The result has been management based primarily on the economic necessities of saving costs and maximizing income. In the process academic considerations, including those concerned with undergraduate curriculum matters, have suffered, with most decisions ultimately being financially driven. In the undergraduate curriculum area the drive has been for re-amalgamation back to fewer composite subjects, with a necessarily great reduction in content of the component parts. Gone are the unique specialist subjects, and in many cases the specialists too! In are the homogenate 'lowest-common-denominator' offerings, taught by one person to a class of hundreds, and necessarily the content of these is generally similar across institutions. In many areas, what we now teach in third-year of a degree has less content than was previously taught in the 1st year. Gone is the flexibility and diversity, both within and between universities, which evolutionary theory would tell us is vital for continued health of the national tertiary educational system. And, most of us have accepted this with scarcely a whimper.

Why am I mentioning all this? Because at least in the system with which I am most familiar, and I believe it is more universal, amongst the areas in biology which have suffered or are suffering the

most, are the traditional areas of animal biology and ecology. So long as the option for students and their teachers to specialize in undergraduate areas is denied, this will remain so. I believe the pendulum has swung too far.

But does it matter? Is this just an old-fashioned view? I don't think so. My concerns are that on a planet where our clever technology is (thankfully at the individual level!) helping to prolong the quality and duration of life, we are producing at least one and perhaps several generations of graduates who will be skilled in the use of the new technologies tools, but ill-equipped to recognize when and where to apply them to solve problems related to, for example, changes in biodiversity, ecosystem dynamics and ecological balance. In ecological terms, is there much point in increasing human survival through medical advances and the growing of 'clever' crops, if we lack the expertise to recognize changes in the health of the planet? There are signs the educational spiral has started to turn again in at least some European universities, with the recognition of the ultimate importance of, and reintroduction to the syllabus of, enhanced studies in taxonomy, biodiversity and ecology. There is now a need to reappraise the directions both educational and management practices are taking in Australian universities.

I feel privileged to have been a part of the university system through what were relatively stable and balanced times when, although there were pressures and stresses they were more academically focused than financially based, as is now the case. It will be up to clever and concerned people, like especially the younger ones assembled here today, to ensure appropriate academic balances are developed and kept into the future.

*Jack Greenwood*