

INTRODUCTION

A cooperative enterprise; how this book came to be written.

If you choose not to read this and move straight on to *In Homage to Darwin*, we will not be offended. The story, however, of how two scientific dinosaurs came to cooperate in writing about their shared world view, gleaned from a combined total of more than 150 years of independent study of biology, needs, we feel, some explanation.

Any two biologists can be relied on to arrive at different personal understandings of Charles Darwin's magnificent legacy. However, few were as far apart as the authors of this book when they first met in the 1970s. At that time, a split was appearing in the practice of science. Traditionalists were persevering with the reduction of whole systems into their constituent parts, an approach that had led to the triumphs of the decipherment of the genetic code and the new science of genomics. A different way of thinking was combining science and new social movements. Post-normal science was beginning to accept that, for complex issues such as planetary climate change and global food security, scientists needed to practise their art where facts were uncertain, values in dispute, stakes high and decisions urgent.

The authors met, 45 years ago, in the Department of Zoology at The Australian National University (ANU). Chris Bryant was then a reader, with a flourishing research group in parasite biochemistry. He had remained a reductionist, focusing his attention on the subcellular mechanisms of respiration in anaerobic organisms. Val Brown, having raised a family, was a mature-age PhD student working in the then-new field of holistic thinking as applied to the human sciences. She was already a fan of Lovelock's space-engendered view of the Earth as a self-maintaining and self-organising planetary system he named 'Gaia'.

They did not hit it off.

It is hardly surprising. They had begun at opposite ends, both of the world and of their discipline. Chris was born in North London in 1936. He was educated at an English public school. He first entered a biological laboratory in 1948 and instantly fell in love with the smell of solvents, the specimen cases and the microscopes. He came under the influence of Theodore Savory who, though a schoolmaster, was a major and well-published authority on spiders. He was also the author of a very reductionist, but well thought-of, book expressing these views (Savory 1936). After six years of exposure to his excellent teaching, Chris, like his mentor, was a confirmed reductionist. He felt that by studying the minutiae of organisms he would eventually come to understand the whole.

This view of life was not dispelled by his time as an undergraduate at London University. After completing a Master's degree and a PhD, in 1961, he met and married Anne, an Australian nurse. He decided to try his luck in Australia. He accepted a lectureship in zoology at ANU. Twenty-five years later he was appointed to its chair.

Val's first lesson in collective thinking occurred on leaving her conservative family and Anglican convent school for the University of Queensland. There, she found herself one of six women among 700 men and, despite distractions, obtained a combined zoology and botany degree. At this time, the influences on her thinking were the zoologist William Stephenson, well known for his work on the Great Barrier Reef, and the botanist Desmond Herbert, a biogeographer with a passionate interest in the subtropical rainforest. They were field biologists, and between them they cemented Val's love for interactive biological systems as they occurred in the 'real' world.

On graduating, she accepted a post of research officer, and so became the first woman scientist in the CSIRO in Brisbane. Sadly, it was then the rule for women in government employ to resign when they got married, and she had to leave. After raising three children, she returned to academia at The Australian National University's Department of Zoology to undertake a Master's degree that grew into a PhD on *Holism in the University Curriculum?* The question mark was important because she found that, while the curriculum professed to be holistic, it wasn't.

Neither followed the expected pathways in their original fields. Dissatisfied with the context-free subcellular reactions that he had been studying, Chris began to pay more attention to the host–parasite relationship in its entirety, moving much closer to a holistic view of life. He developed an interest in the adaptive relationship between the parasite and its host environment and the interdependence that existed between non-parasitic organisms. Moving even further from mainstream reductionism, he relinquished his chair in 1996 and then, as professor emeritus, moved on to help establish the National Centre for the Public Awareness of Science at ANU, of which he was the first director.

On a converging track, Val applied the findings of her PhD to practical ways of integrating social and physical sciences in health, education, environmental management and government. As a community service, she acted as consumer representative on major national decision-making bodies in these same fields. In time, this developed into a national research centre, the Local Sustainability Project at ANU. Val went on to become professor emerita in Environmental Health at Western Sydney University, and then took the Local Sustainability Project back to ANU in 2003.

After Chris and Val crossed swords in the 1970s, their paths did not merge again until 2014. Then they found themselves sitting next to each other at a celebration of the life of a mutual colleague. They started a conversation and discovered that there were now many common elements in their scientific thinking and reading, and that, over the years, their ideas had converged towards the concept of a wholly integrated, planetary Gaia-like biosphere that included human society. It was as if they had been part of a landscape in which they travelled separately through a forest, along a track leading towards the distant horizon. Val had always had her head in the air and her eyes fixed on the tree canopy while Chris's attention had been concentrated on the detail of the understory. They agreed that it was high time to see if their world images were congruent – whether they were indeed travelling in the same forest.

Not only did they find that their professional experiences had led them to the same conclusions, they had arrived at a mutual interest in the interactions between biophysical and social evolution, and a deep admiration for Charles Darwin. The conversation moved from deploring the commonly held but unscientific interpretation of Darwin's work as

nature 'red in tooth and claw' when he himself preferred the idea of an all-connecting natural system – a 'tangled bank'. So began a series of conversations that led to this book.

The outcome? Two people coming from opposite ends of a scientific tradition have presumed to retell the story of the evolution of the integrated planet – and with as little technical jargon as possible.

This text is taken from *Cooperative Evolution: Reclaiming Darwin's Vision*,
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