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In this issue of the *Review* there are six papers that celebrate the 200th anniversary of Charles Darwin's birth.

In the first paper, *Charles Darwin as a scientist,* David Penny introduces us to Darwin's scientific 'modus operandi' and three important aspects of his reasoning: his hypothetico-deductive approach, his search for mechanisms to explain past events, and his insistence on continuity between humans and a common ancestor with apes. In his ensuing analysis, David concludes that Darwin worked in a way that is surprisingly consistent with the ideas of Karl Popper on how the best scientists work – and not, as many consider, as a poor theoriser who simply collected a lot of data and just happened to be in the right place at the right time.

In *Darwin and DNA: explaining the New Zealand flora,* Richard Winkworth indicates that the origins of the New Zealand biota have long been of interest to biologists, from the earliest visitors until the present day. The reasons for this interest are similar to those that drove Darwin's research on the Galápagos finches – where did our flora come from and what led to the diversity of the groups present? However, until recently, considerable uncertainty has remained about even broad-scale evolutionary patterns. In his article, Richard describes how the application of molecular approaches has helped transform understanding of evolutionary processes in the New Zealand flora as well as how these tools are likely to contribute in the future.

Simon Greenhill and Russell Gray, in their paper *Darwin, languages, and two great Pacific voyages,* point out that there are numerous parallels between the evolution of languages and biological evolution. Their phylogenetic analyses of Austronesian languages show the combined power of computational evolutionary methods and large lexical databases to answer questions about human prehistory. Just as molecular phylogenies is the fundamental framework for studying biological evolution, so language trees open up the exciting possibility of a Darwinian approach to culture based on rigorous phylogenetic methods. Darwin argued that the tree of life covers the surface of the earth with its 'ever-branching and beautiful ramifications', and language phylogenies enable us to answer questions about human origins and explore the beautiful ramifications of human languages and cultures.

In her paper, Using *New Zealand examples to teach Darwin's 'Origin of Species': Lessons from molecular phylogenetic studies of cicadas,* Chris Simon points out that New Zealand is a treasure trove of evolutionary examples and an excellent place to study evolutionary biology.

Since 1992 her research group has been studying the evolution, biogeography, and systematics of the New Zealand cicadas. She illustrates how this group of organisms arising from just two ancestral colonisation events has spread across the landscape, diversified, and provided evidence to support many of Darwin's evolutionary hypotheses. She indicates that many other New Zealand organisms illustrate the same phenomena and can be used to simultaneously teach Darwinian principles and New Zealand natural history and evolution.

In doing so she comments, we can, in Darwin's own words, 'be brought somewhat near to that great fact—that mystery of mysteries—the first appearance of new beings on this earth.'

In *Darwin, sexual selection, and human evolution,* Alan Dixson tells us that, in addition to creating the foundations of modern evolutionary theory, Darwin was a pioneer in the field of sexology. This somewhat radical statement is justified, in Alan's view, by a consideration of his work in *The Descent of Man and Selection in Relation to Sex,* where he applied his theories concerning sexual selection in animals to questions of human evolution. While Alan believes that this fundamental contribution is still relevant today, we now possess much more information, and insights gained from studies of fossil records, modern developments in molecular genetics, reproductive physiology, anthropology, sexological research, and evolutionary psychology. Collaborations between workers in these disciplines will be required to achieve greater knowledge of the evolution of human reproduction. Cross-cultural studies of human sexual dimorphism, sexual selection, and mate choice are essential if we are to have any hope of establishing which traits are derived from the shared African ancestry of modern human populations.

Finally, in her paper on the *Evolution of senior secondary school biology education in New Zealand* : *Impact of changes in biological sciences from 1878 to 2008,* Jacquie Bay points out that biological science has undergone exponential growth and change in the past 150 years, impacting on society in areas of health, horticulture, agriculture, biotechnology, sustainability, and environmental management. Similarly secondary school biology education has also experienced extensive growth and change, influenced by advances in science, technology, pedagogy, and educational practice.

Now, for the 21st century, Jacquie suggests that biology education needs to evolve into an environment that will create opportunity for the development of life-long science literacy capability with the potential to develop advanced understanding of science. To achieve this, key stakeholders need to work to develop a public understanding of the broad role of education and the difference between education that leads to lifelong learning capability and traditional education measured by content knowledge. The key to this is discussion and collaboration between science educators, scientists, science-related industries, and the community.

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