E-Book Review

Hamish Campbell

The Zealandia Drowning Debate: Did New Zealand sink beneath the waves?

Reviewed by Mike Berridge

This is a very readable and thoroughly thought-provoking short review of the Zealandia Drowning Debate from the perspective of a geologist with interests in palaeontology. Few readers will be able to resist being drawn into this debate about our geological and biological heritage.

The hypothesis that most of the land mass of Zealandia that split from Gondwana some 80 million years ago was submerged under the ocean 20–25 million years ago resulting in extensive loss of life by drowning is an unfortunate metaphor that, as pointed out by the author, does not reflect the lengthy times of the geological and biological processes involved that cover millions of years. Incremental loss of habitat would be a more appropriate and less emotional terminology, barring some cataclysmic regional event that actually did drown all terrestrial life and for which we have no evidence.

The view that during the late Oligocene to early Miocene there was insufficient remnant landmass from Zealandia to support life, or to be more pedantic since size matters in this debate, higher life forms, is an important geological perspective that demands attention. A similarly persuasive response from biologists is anticipated backed by the most robust arguments that support continuity of Gondwanan life, for example, tuatara, lizards, frogs, weta and perhaps flightless birds like the moa or kiwi, all of which have been shown to be present at fossil-rich sites in New Zealand within the few million years that covers the drowning hypothesis. Did these organisms survive on residual islands or did they arrive by whatever means from the mainland to the southwest soon after the 'drowning'. Just how much island are we talking about here? Even our hard-wired geologist-author asserts in his Conclusion, 'There were islands and there may even have been a continuum of islands'. Well, Stephens Island at 1.5 square kilometres, or 0.0006% of New Zealand's land area supports some 30,000 tuatara, so this size of island along with its bird and insect life, including perhaps, wetas and some vegetation is easily accommodated with the drowning hypothesis and would seem to be a more likely scenario than a several thousand kilometre journey by poor swimmers on log rafts. Furthermore, tuatara are thought to have been extinct elsewhere in the world for at least 60 million years. For flightless birds like moa and kiwi, much larger tracts of land or archipelagos with lush vegetation would have been required, perhaps 1% of New Zealand's landmass. This could also be accommodated within the drowning hypothesis, but with much lower probability given the persuasive geological case presented by Campbell for extensive submersion of Zealandia, albeit from a contemporary New Zealand geological perspective. Counter-arguments based on molecular phylogeny and new fossil discoveries will undoubtedly spring some surprises that will better define future debate on this issue.

Perhaps the hard edge of the Drowning Debate has now retreated a little with concessions on both sides. Thus, despite there being rock-solid geopalaentological evidence that most life on Zealandia was slowly purged by land submersion over many millions of years, there is also little doubt that some islands remained that could harbour at least some extant life forms. So the scientific debate is redefined around the extent to which the 5% of life in New Zealand today that cannot easily be explained by long distance dispersal has an indigenous origin, at least within the time constraints of the geological record of maximal submersion.

This is an engaging and entertaining scientific viewpoint written by one of New Zealand's most celebrated science communicators on a subject of more than passing interest to hot-blooded Kiwis who might like to stamp their unique identity on the world in a manner that cannot be easily usurped by our trans-Tasman rivals, who might see fit to lay claim to the kiwi and tuatara given half a chance. Let the science prevail.

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