Question 30 (7 marks)

Geological and biological history of New Zealand

Event	*Time*
Australia and New Zealand separated	85–65 million years ago
New Zealand drifted east and subsided, its land mostly under seawater (most fossils are marine)	85–22 million years ago
Mammals became abundant worldwide	60 million years ago
Earliest migratory bird fossils	55 million years ago
New land created by volcanoes in New Zealand	22 million years ago to present
Many new, unique species of birds appear in the fossil record	20 million years ago to present
Islands completely devoid of mammals. Birds occupied niches that were usually occupied by mammals	700 years ago

Use this information and other relevant knowledge to demonstrate how the practice of biology has led to the validation of current theories of evolution. **7**

Current theories of evolution relevant to the information found in this table are mostly the theory of natural selection, as well as which is also supported by biogeography.
When Australia and New Zealand seperated, 85-65 million years ago (MYA), New Zealand was mostly underwater. For this reason, the worldwide abundance of mammals around 60 MYA, had no effect on

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Question 30 (continued)

New Zealand, whose islands in current era (700 years ago) are completely devoid apart of mammals (which mostly require land to survive)

It could be suggested that over 85 MYA when Australia and New Zealand were still attached, they shared similar species of flightless birds. Natural selection ~~over many~~ and environmental factors over many millions years, post Australia and New Zealands split, means the evolution of flightless birds. For example, Australia has the emu, which is structurally different to the Moa, a now extict New Zealand flightless bird, and the Kiwi Bird. Honever, all being flightless birds, they very well could have come from a common ancestor. This validates current evolutionary theories such as biogeography and natural selection.

The formation of new land caused by volcanoes meant many new birds became present in New Zealand. Many of these may have been migratory birds from foreign countries. The surving flightless birds may have withstood the very little land of New Zealand, and developed adaptations to survive these conditions at the time.

End of Question 30