

**Question 30** (7 marks)

**Geological and biological history of New Zealand**

<i>Event</i>	<i>Time</i>
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.

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There are many techniques used by biologists to validate the theory of evolution. ~~Through~~ ~~all of these~~ Each adds some depth and examples to the theories.

Biologists use comparative anatomy to prove a common ancestor. This close analysis of organisms came to the discovery of the ~~pentadactyl limb~~ pentadactal limb found in many mammals. This limb shows a link between these organisms proving

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that there was a common ancestor.

Biologists also use biogeography to help explain theories of evolution. ~~This~~ This technique compares where the world was in the past and what fossils are found. An example is the occurrence of flightless birds only in the southern hemisphere suggesting a common ancestor.

Paleontology is the study of fossils. All the information in the table has been found with fossils. The date that they were found suggest ~~that~~ when the species was created.

Biochemistry can be used to see the similarities between species. This technology has only been available in recent years. This can link animals in how close their DNA matches.

Embryology is used by biologist to show the ~~relationship~~ relationship ~~at birth of~~ ~~some~~ of embryos of some organisms. The thought is that if they are similar there there must be a common ancestor.

All of these techniques help biologist verify the theories of evolution.

End of Question 30