Summary Report - *Birds New Zealand* David Medway Scholarship
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In June 2020 I was very grateful to receive a David Medway Scholarship from Birds New Zealand which helped support my MSc research on bird bone shape and taxonomic identification. The primary aim of my project was to develop a method that might identify the family that a bird belongs to using the shape of isolated bones. This method can be useful when molecular methods of identification are unavailable or are not feasible, for example in the case of fossils. I sought the David Medway Scholarship so that I might apply this method to a 3 million year old fossil bird bone from the Taranaki region that is housed in Canterbury Museum. A taxonomic identification for this fossil would contribute to our growing knowledge about the bird community of Zealandia during the Pliocene, a time when global temperatures were as warm as we expect they will become again by the end of this century.

The novel 3D shape-based taxonomic classification method that I developed was highly successful at assigning seabird bones to their correct order and family. Landmark-based classification analysis assigned femora from penguins and tubenosed birds to the correct order and family with 100% and 93.5% accuracy, respectively. Pseudolandmark-based (landmark-free) classification analysis assigned femora and humeri from penguins and tubenosed birds to both the correct order and family with 100% accuracy.

In 2019 I visited Dr Paul Scofield, Senior Curator at Canterbury Museum in Christchurch to begin building my datasets of digitised seabird humeri and femora. During this visit Paul Scofield provided the Taranaki fossil for me to 3D scan and landmark for shape analysis. Landmarks would be applied to a large comparative sample of seabird humeri with the goal of analysing shape similarities among bones and using these data to produce a classification for the fossil. Membership of the fossil humerus would be predicted to an order, family and genus using the taxonomic classification method that I developed as my global aim. Unfortunately though, due to interruptions in 2020, I have not yet been able to complete the work on the fossil. Based on observations of size and morphology between the fossil humerus and comparative material we have an initial hypothesis regarding the identification of the fossil. Alan Tennyson and Barbara Tomotani recently described a *Procellaria* petrel from the same location (https://doi.org/10.11606/1807-0205/2021.61.16) and so I now have a great hypothesis to test as I continue to seek an identification for the fossil that Canterbury Museum and the David Medway Scholarship have kindly enabled me to study.

The David Medway Scholarship awarded to me by Birds New Zealand was pivotal in the success that I have achieved in this MSc project. With my thesis now submitted, I look forward to using the techniques developed to categorise and identify further fossil material.