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Avian Fossils from Quaternary Deposits in 'Green Waterhole Cave', South-eastern South Australia

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ABSTRACT. Sixteen species of birds have been identified from Quaternary-aged deposits in 'Green Waterhole Cave' (L-81 of the Cave Exploration Group of South Australia cave classification) approximately twenty-four kilometres west of Mt Gambier, south-eastern South Australia. All but three species are referable to modern species. The exceptions are a new accipitrid (to be described by Drs P.V. Rich and G.F. van Tets), a new species of coucal, and a new species of passeriform. It is suggested that one of the extant species and all of the new taxa are examples of Pleistocene gigantism. Geographic range extensions are demonstrated for *Gallinula mortierii, Calyptorhynchus lathami* and the genera *Centropus* and *Orthonyx*. Taphonomic study of the deposit, using faunal composition as the main indicator, implies that water was the accumulating agent. Relative dating of the locality has been made by using sea level curves (last sea level transgression over the present eustatic high) and the presence of megafauna. Dating of the last sea level transgression suggests a maximum age of 125,000 years before present (y.B.P.) for the opening of the cave to the surface, because the cave lacks marine influence. The maximum age of accumulation is anytime before 15,000 y.B.P., which is the time of last occurrence of most mammalian megafauna.

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'Green Waterhole Cave' (L-81 of the Cave Exploration Group of South Australia cave classification) is a drowned cave in the Tantanoola district of south-eastern South Australia, about twenty-four kilometres west of Mount Gambier (Fig. 1). The host rock is the Gambier Limestone of the Oligo-Miocene-aged Glenelg Group. L-81 lies on the border of the Kongorong Shank and Mt Gambier sections of Marker (1975). Karst production in this area, according to Marker, "has been promoted by late Quaternary marine fluctuations...". The cave shows no marine influence. The last marine incursion into the area at 124,000 y.B.P., therefore, may be taken as a maximum age for the opening of the cave (Shackleton & Opdyke, 1973; Bloom *et al.*, 1974). Karst development would have been aided by subsequent marine fluctuations, increased rainfall and greater seasonal temperature variations, especially during the last glacial (Sweeting, 1973: 156-157), therefore making it likely that the cavern opened to the surface sometime after the last interglacial.

The cavern probably opened in the latter half of the last glacial, based on the large proportion of extant species in the fossil avifauna. The floral history should give an idea of environmental changes during that time. The floral history of south-eastern South Australia and western Victoria is deduced from work on pollen-bearing sediments covering the past 50,000 y.B.P. collected within Lake Leake, S.A. and Lake Keilambete, Vic. (Dodson, 1974a, b, 1975). Briefly, the area was dominated by *Eucalyptus* woodland and heath before the oldest date of 50,000 y.B.P. (the limit of radiocarbon dating) up to 39,000 y.B.P. At this time, there was an ephemeral change to open formation that suggested dryer times. The flora reverted back to *Eucalyptus* woodland and heath understory at 38,000 y.B.P. After 35,000 y.B.P. the precipitation decreased. At about the same time, the coastline migrated further south as a result of the lowering of sea level synchronous with the last glaciation. It is assumed that, from then on, the area was drier than it had been at any other time in the last 50,000 years. *Casuarina* pollen, with