AN OWLET-NIGHTJAR FROM NEW ZEALAND

By R. J. SCARLETT, Canterbury Museum

ABSTRACT

A sub-fossil Owlet-Nightjar, related to, but with larger limbs than, the genus **Aegotheles,** from a number of New Zealand localities, is described, and placed in a new genus.

DISCUSSION

For many years material has accumulated in the Canterbury Museum, of a bird new to the New Zealand afunal list. The bones come from caves and a swamp, and show a wide distribution in both North and South Islands. The material consists of three part skeletons, and a number of odd bones. A few bones were collected last century, but most have been found in the last twenty years, largely owing to the greatly accelerated exploration of caves by the various speleological groups, most of which kindly make their finds available for identification.

Lack of comparative material in New Zealand Museums prevented identification until 1967, when, while visiting Australia, I was able, through the courtesy of Messrs. Herbert Condon, of the South Australian Museum, and Alan McEvey, of the National Museum of Victoria, to examine and measure skeletons of the *Caprimulgiformes, Podargus, Eurostopodus* and *Aegotheles.* Subsequently I obtained by exchange, from the National Museum of Victoria, skeletons of *Podargus* and *Aegotheles.* Dr. Warren Hitchcock of C.S.I.R.O. Wildlife Division, Canberra, supplied lists of tarsal measurements of New Guinea species of *Aegotheles,* and Mr. Graham Turbott, now Director of the Auckland Museum, made the Pukemiro Cave specimen available for study. To all these helpers I am grateful.

When I examined the Australian material, I realised that the New Zealand bones belonged to an Owlet-nightjar, with cranium and sternum hardly distinguishable from the Australian and New Guinea forms, but with much larger wings and legs. Because of the latter feature, I propose a new genus *Megaegotheles,* and species, *novaezealandiae* for the New Zealand bird.

The New Zealand material consists of 3 part-skeletons all of which are sub-adult, and a number of odd bones.

SOUTH ISLAND

AV 5090: Earnscleugh Cave, Otago: 1874. F. W. Hutton. Pelvis (in 3 pieces) labelled " Sceloglaux " by Hutton.

AV 5124: Earnscleugh Cave, Otago. 1874. F. W. Hutton. Distal end of R. tibio-tarsus. R. Tarso-metatarsus: Both labelled " Creadion " by Hutton.

AV 19,890: 50 x 60 c.m. test pit floor of Rockshelter B at head of Frenchman's Gully, Timaru district 1/9/1964. R. J. Scarlett. Proximal end and part shaft of L. tarso-metatarsus.

AV 7241: Pyramid Valley Swamp, North Canterbury. 1/4/1942. J. R. Eyles and R. J. Scarlett. R. humerus.

AV 7242: Pyramid Valley Swamp. 4/3/1949. J. R. Eyles and R. J. Scarlett. L. humerus.

AV 15,118: Pyramid Valley Swamp. 18/2/1957. R. J. Scarlett. L. tibio-tarsus.

AV 13, 772: Pyramid Valley Swamp. 13/2/1955. Canterbury Museum party. L. humerus.

AV 14, 467: Pyramid Valley Swamp. 17/2/1956. R. J. Scarlett. R. humerus.

AV 17,333: Limestone Rockshelter No. 1, farm of Euan Murchison, Weka Pass, North Canterbury, 15/3/1959. G. R. Kennington, R. and L. proximal end L. femora, distal end and shaft of R. tibio-tarsus, distal end and part shaft of L. tarso-metatarsus, R. humerus (mixed bones).

AV 17,774: Locality as AV 17,333. 23/9/1961. G. R. Kennington and R. J. Scarlett. R. tibio-tarsus, proximal ends and part shaft of I.R. 2L.; distal ends and part shaft of R. tarso-metatarsi, L. humerus (mixed bones).

AV 16,996: Harwood Hole Limestone cave, Canaan, Takaka, Nelson. Resting on flowstone surface, c. 100 feet above cave-floor (the cave is the deepest in New Zealand). Jan. 1960. O. R. Wilkes. Sub adult: Pelvis, sternum, 3 vertebrae, 8 ribs, sternal rib, R. & L. femora, R. shaft of L. tibio-tarsi, R. fibula, shaft of R. tarso-metatarsus, L. shaft of R. humeri, R. coracoid, R. scapula: phalanx (individual skeleton).

AV 21,343: Pothole, Canaan Road, Takaka: 1961. E. Sixtus: distal end of L. tibio-tarsus: R. tarso-metatarsus.

AV 16, 745: Moa Hole, (pot hole) Canaan, Takaka. Jan. 1960. O. R. Wilkes: R. & L. tarso-metatarsi.

AV 16,728: Moa Hole, Canaan, Takaka. Jan. 1960: O. R. Wilkes. Sternum (possibly belonging to AV 16,745).

AV 16,744: Kiwi Hole, Canaan, Takaka, upper level. Jan. 1960. O. R. Wilkes. Sub-adult R. tarso-metatarsus.

AV 16,856: Fissure 3, Limestone Bluff, Heaphy River, N.W. Nelson. 3/12/1952. O. R. Wilkes: Sub-adult proximal end and shaft of R. tarso-metatarsus.

AV 16,640: Fissure 3, Limestone Bluff, Heaphy River. 30/11/59 - 2/12/59. R. J. Scarlett and O. R. Wilkes: R. Carpo-metacarpus.

AV 16,638: Fissure 3, Limestone Bluff, Heaphy River, data as for AV 16,640. R. & L. humeri: R. distal end and part shaft L. tibio-tarsi, R. & L. tarso-metatarsi.

AV 16,773: Fissure 4, above Limestone Bluff, Heaphy River: 2/12/1959. O. R. Wilkes. R. & L. humeri, R. tibio-tarsus (minus head), proximal L. tarso-metatarsus.

AV 18,012: Location 1a, Gouland Downs Limestone cave complex, N.W. Nelson. 21/11/1961. O. R. Wilkes. L. tarso-metatarsus: R. humerus (minus head).

AV 17,647: Cascade Cave, Paturau, N.W. Nelson. 5/8/1961. P. R. Kettle. Distal end and shaft of R., part shaft of L. tibio-tarsi: broken L. tarso-metatarsus: R. humerus (in two pieces) vertebra.

NORTH ISLAND

AV 18,563: Te Waka No. 1 cave in Waitotaran limestone, c. 4,500 feet, about 30 miles from Napier, Hawkes Bay: before the Hatope lapilli shower of 1900 B.P. ±50 (50 A.D.). April 1959. W. H. Hartree: sub-adult R. tarso-metatarsus.

AV 18,564: Same data as AV 18,563: Part cranium: part sacrum: proximal end and shaft of R. tarso-metatarsus.

AV 18,505: Te Waka No. 1: data as above: Shaft of L. humerus.

AV 18,641: Te Waka No. 1: data as above: 1958. R. tibio-tarsus.

AV 18,242: Te Waka No. 1: data as above, except that the bone is before the Waimihia pumice-shower of 3,430 ±50 B.P. (1480 B.C.). W. H. Hartree: —/7/1949. L. humerus.

AV 18,241: Te Waka No. 1: data as for AV 18,242. R. humerus. L. tarso-metatarsus (individual).

AV 18,240: Te Waka No. 1: data as for AV 18,242: L. tarso-metatarsus, L. tibio-tarsus, R. humerus (individual).

AV 17,503: Hukanui 7a, Limestone cave, c. 2,500 feet, about 30 miles from Napier, Hawkes Bay. Upper level, above Hatepe lapilli. 11 & 12/6/61. R. J. Scarlett and W. H. Hartree. L. tarso-metatarsus.

AV 17,512: Hukanui 7a, Lower level in soil above Hatepe lapilli. 7 - 12/6/1961. W. H. Hartree and R. J. Scarlett. R. humerus.

AV 17,513: Hukanui 7a; Lower level, data as for AV 17,512: L. tarso-metatarsus, slightly sub-adult.

AV 16,804: Limestone cave near Puketitiri, Hawkes Bay. —/1/1960. R. A. Whittle. R. tibio-tarsus: distal end and shaft of L. femur.

AV 20,651: Skyline Cave, Mahoenui, Taranaki: 20/2/1966. Taranaki Caving Club, per D. Medway: Sub-adult: pelvis (broken), R. and L. humeri, R. and L. ulnae, R. and part L. radii, R. (broken) and L. carpo-metacarpi, R. and L. scapulae, L. coracoid, 8 vertebrae, L. proximal end distal ends of R. femora, R. distal and part shaft L. tibio tarsi, R. and L. tarso-metatarsi (broken in shaft), R. quadrate, L. posterior ramus of mandible.

Auckland Museum specimen: Gaskell's Caves, Matira, Pukemiro, Auckland. Date ? (before 1958). L. Vause: Sub-adult. Cranium (badly fragmented): part mandible: L. quadrate: Broken pelvis: Distal end and shaft of R. and L. humeri, Proximal ends of R. and L. ulnae, R. and L. radii, R. and L. carpo-metacarpi; Proximal and distal ends of R., distal end of L. coracoids; fragments of R. femur, fragments of R. and L. tibio-tarsi, 11 vertebrae, 3 ribs, 2 sternal ribs (a very fragile specimen).

MATERIAL USED FOR COMPARISON
Aegotheles cristatus (Shaw)

South Australian Museum:

No.	Skeleton	Locality	Sex	Date	Collector
B15062 B10989	Complete Sternum, R. &. L. coracoids, clavicle, R. & L. scapulae, Some sternal ribs (from skin)	Port Augusta	?	–/10/1931	Mrs. L. Bryant
B11472	Sternum, most of leg and wing bones	?	?	?	Dr. A. M. Morgan
B10996	Sternum, clavicle, R. coracoid, R. scapula	Milong	?	6/3/1909	?
B10341	Pelvis, sternum, R. & L. femora, clavicle, R. & L. coracoids, R. & L. scapulae, 17 vertebrae, ribs, sternal ribs, L. ends (from skin), R. & L. humeri.	?	?	?	Dr. A. M. Morgan
B11629	Complete	?	F	5/11/1928	Dr. A. M. Morgan

National Museum of Victoria:					
W6769	Complete	?	?	?	?
W6466	Complete	?	?	?	?
W2340	Complete	?	?	?	?
W6585	Lacks mandible. Pelvis broken.	?	?	?	?
W6680	Complete	?	?	?	?
B8778 (C.M. A.V.21,756)	Complete except for a few ribs.	Willaroo, Casterton, Victoria	M	10/6/1966	C. Austin

NOTE ON AUTHOR'S NAME: The name **cristatus,** for an Owlet-Nightjar, was first published in J. White's **Journal of a Voyage to New South Wales,** 1790, p. 241, and plate 29. Peters (**Checklist of Birds of the World,** Vol. IV, p. 182) and Rand and Gilliard (**Handbook of New Guinea Birds,** p. 262)) give the author as White. On the other hand Hartert in the ***Catalogue of Birds in the British Museum*** *quotes it as* " Shaw," in White's "Voyages," and Australian writers also quote it as " Shaw." As I have not access to the original publication, I am unable to decide which authors are right.

The choice of a specimen for the Holotype of *Megaegotheles* has been a problem. Of the completely mature bones, very few are associated. After much consideration, I have chosen AV 16,996, as the Holotype, and the other specimens listed are Paratypes. The Holotype skeleton is closer to maturity than AV 20,651 and the skeleton belonging to Auckland Museum, although it contains fewer bones. Unfortunately, the Holotype has no cranium, and the following cranial description is of AV 18,564:

CRANIUM

This cranium is somewhat defective, being broken in the post-orbital to para-occipital region on the rightside, with two indentations on the top, and lacking pre-maxilla, mandible, quadrates, quadrato-jugals, palatines, vomer, pterygoids and other cranial bones. It terminates at the narrowest part of the inter-orbital region, lacking the forked part of the " flexure " to which the pre-maxilla hinges in *Aegotheles.* It is even more constricted in this region than in most *Aegotheles,* as the table of cranial measurements indicates. It has the broad, rounded posterior region of *Aegotheles.* The Nightjars *(Eurostopodus)* are almost square in this region, and while the Frogmouths *(Podargus)* are rounded posteriorly, both Nightjars and Frogmouths are very much broader in comparison with size, than in Owlet-Nightjars. Crania of the only other three genera among the many in the *Caprimulgiformes* available to me, *Caprimulgus europaeus* Linne from Europe, *Steatornis caripensis* Humboldt from Trinidad, and *Phalaenoptilus nuttallii hueyii* Dickey, from California, are all much less rounded posteriorly than *Aegotheles* or *Megaegotheles,* and very much broader inter-orbitally. The orbital walls of *Megaegotheles* cover the whole of the orbital space, with the exception of 11 foramina, one very small approximately 0.8 c.m. from the top of the cranium, and 1.1 c.m. anterior to the post-orbital process, another approximately in line with this, and 1.4 c.m. anterior to the post-orbital process, 0.075 c.m. behind, and slightly above the most anterior foramen is another very minute one, and 0.2 c.m. behind the one first mentioned, and slightly above it, is another minute one.

The largest foramen is a circular, thick-walled hole, opening " sideways " and entering in an anterior direction *forward* of a depression, from the base of which 3 closely grouped tiny foramina

[Michael Trotter

Plate XL — **Megaegotheles novaezealandiae:** Cranium AV 18,564, left dorsal and posterior views.

also open, and above which there are a further two minute foramina. Inside, on the lower part of the "wall" of the largest foramen, is another minute foramen. The largest foramen is 1.1 c.m. from the top of the cranium, and 0.55 c.m. anterior to the post-orbital process. It measures 0.125 c.m. The *Aegotheles* cranium used for comparison, B 8778, is cracked through the orbital walls, and only the large foramen, which enters more directly than in *Megaegatheles, above* a depression containing two small foramina, can be seen.

The space between the frontal and squamosal is 0.415 c.m., and the distance between post-orbital and para-occipital processes is 0.165 c.m.

There is a very small foramen on the ridge of the squamosal 0.475 c.m. from the edge, and 0.875 c.m. from the centre of the supra-occipital " bulge." On the *Aegotheles* cranium similar foramina cannot be seen. The occipital foramen is broken on the right, but measures approximately 0.5 c.m. across it. The fragments of mandible (R. + L. posterior rami, and part of the anterior left ramus) in the Auckland Museum specimen, agree well with the mandible of *Aegotheles* in conformation, although in a fully adult bird they would have been a little larger.

PELVIS

This is described from the Holotype, AV 16,996, where it is better preserved than in the other specimens. The measurements are given in the table below. It is very similar to *Aegotheles* in form, with a pronounced central ridge arising from the anterior 2 sacral vertebrae, forming a " crest " between the two anterior portions of the ilia. This " crest " rises above the ilia, as in *Aegotheles* but is somewhat more pronounced than in the latter. The ischia and pubes diverge or " splay " widely at the posterior, as in *Aegotheles.* The ischio-iliac (post-acetubular) foramen is slightly more ovoid, less rounded, in *Megaegotheles* than in *Aegotheles,* as the length and breadth measurements (0.35 x 0.25 for AV 16,996, 0.375 x 0.2 for AV 5090, 0.35 x 0.2 for the Auckland Museum specimen, and 0.315 x 0.215 for B 8778) indicate.

STERNUM

The only mature specimen, AV 16,728, has an abnormality on the right side, as will be seen in the photograph, but otherwise, except for larger size, *Megaegotheles* is very similar to *Aegotheles*. The central process is broader in *Megaegotheles* (AV 16,728: 0.45; AV 16,996: 0.35; Auckland Museum individual: 0.425; and *Aegotheles* B 8778: 0.15 c.m.). These measurements were taken at the narrowest posterior portion, adjacent to the narrow band of bone which unites all the posterior processes. In *Megaegotheles* the anterior processes thrust forward in a more pronounced fashion, and the central anterior projection for the attachment of the clavicle, which is divided in *Aegotheles*, is a blunt, ribbed point in *Megaegotheles*.

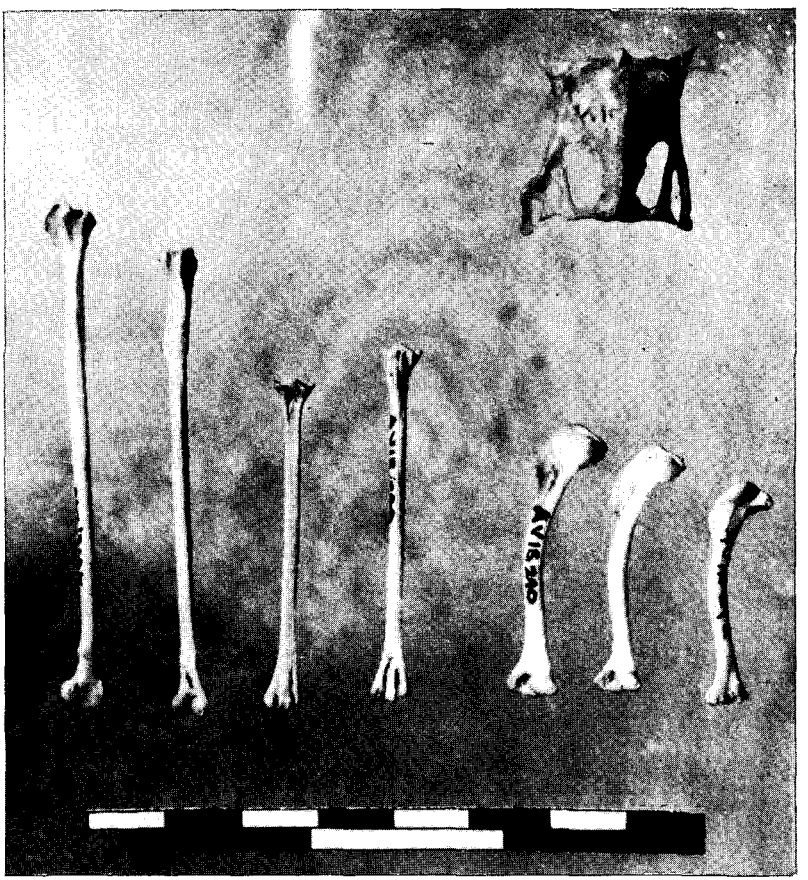

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Plate XLI — **Megaegotheles novaezealandiae:** Sternum: AV 16,728 (note abnormality), tibio-tarsi. AV 18,240: left side. AV 18,641: front: tarso-metatarsi. AV 18,241 front: AV 18,240: back: humeri; AV 18,240; AV 18,241. front AV 18,242: back views.

FEMUR

Shaft oval, much expanded proximally and distally. Both ends have a relatively flattened appearance: Except for the much greater size *Megaegotheles* is similar in this bone to *Aegotheles.* The shaft is relatively straight. There is a tubercle on the ventral surface, near the outer edge, distally. A similar tubercle is barely visible in *Aegotheles.*

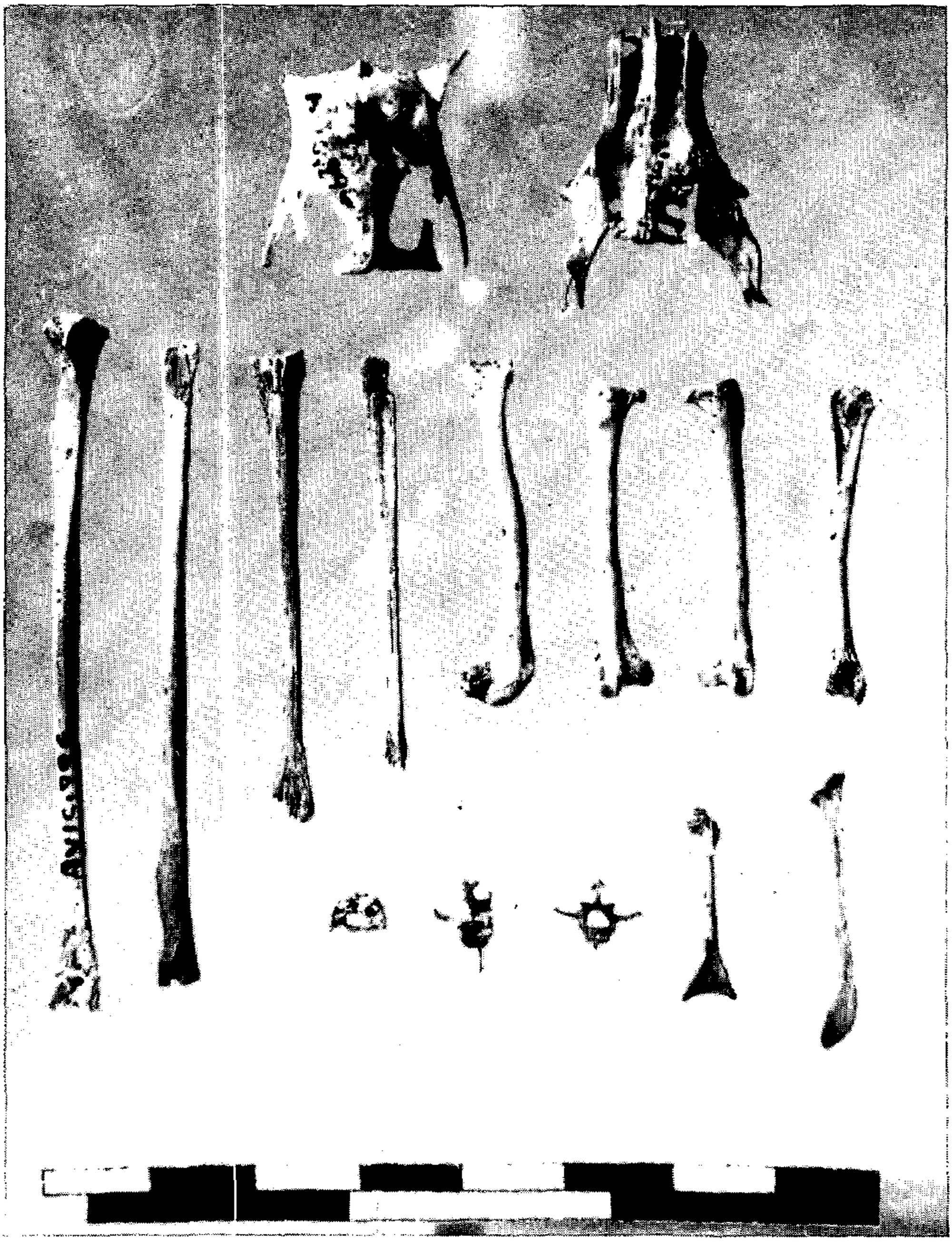

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Plate XLII — Holotype of **Megaegotheles novaezealandiae:** AV 16,996 (L. tibio-tarsus. R. and L. humeri inverted).

TIBIO-TARSUS

This again is much larger than in *Aegotheles.* Shaft almost round in section. Viewed from above, the head is almost square, with the exception of the cnemial crest. The latter is short, slopes fairly sharply upwards from the shaft, and is moderately produced above. The measurements of the crest on four adult bones, anterior to posterior, ranged from 0.65 to 0.725 cm. In *Aegotheles* the cnemial crest is less pronounced relatively, than in *Megaegotheles.* Distally, the two genera are very similar except for size.

TARSO METATARSUS

In *Megaegotheles* this bone appears as a greatly enlarged version of *Aegotheles.* The condyles expand in an even slope, the inner, as is usual in birds, being shorter than the central one. In *Megaegotheles,* in most cases, the outer condyle is very little shorter than the central one, and this is also the case in *Aegotheles.*

In general, leg bones of *Megaegotheles* resemble closely those of *Aegotheles,* except in the much larger size, the tibio-tarsi and tarso-metatarsi being about twice as large in the new genus as in *Aegotheles.*

HUMERUS

Except for greatly increased size, there is little to separate the humeri of *Megaegotheles* and *Aegotheles,* except that the former appear even more bowed in the shaft. The difference will be apparent in the photograph.

ULNA, RADIUS, CARPO-METACARPUS

These bones are also greatly enlarged version of *Aegotheles,* and call for no special comment.

The measurements for all the various bones of *Megaegotheles,* with comparative measurements of *Aegotheles,* follow. All are in centimetres.

Measurements for *Aegotheles cristatus* and *Megaegotheles* (AV 18,564)

CRANIUM, PREMAXILLA, MANDIBLE

	Length Cranium & Premaxilla	Premaxilla chord of culmen	Width at post Orbitals	Height	Occipital to flexure	Width between orbits	Width of Orbit	Mandible Width	Mandible length
South Australian Museum									
B11629F	3.7	1.85	2.2	1.7	2.05	0.25	1.5	2.4	2.5
B11472	3.65 ±	1.75	2.35	1.75	2.3	0.2	1.6	No mandible	
B15062	3.35	–	2.2+	1.8	2.15	0.225	1.5	No mandible	
Nat. Museum Victoria									
B8778	3.9	1.5	2.4	1.575	2.35	0.275	1.875	2.1	2.6
W6769	3.7	–	2.4	1.8	2.4	0.3	1.8	2.3	2.75
W2340	3.7	–	2.35	1.8	2.2	0.25	1.65	2.2	2.55
W6680	3.7	–	2.3	1.8	2.3	0.25	1.75	No mandible	
W6585	3.5	–	2.3	1.8	2.2	0.25	1.7	No mandible	
W6466	3.5	–	2.3	1.6	2.3	0.3	1.8	No mandible	
Megaegotheles									
AV18,564	–	–	2.8 (estimated)	1.7+	2.45+	0.2	1.9+	No mandible	

PELVIS

Aegotheles cristatus	Length	Sacral length	Anterior width	Posterior width	Width across supra-trochanteric processes
S. Aus. Museum					
B10341	2.4	–	0.8	1.7	1.6
B11629	2.1	1.6	0.9	2.0	1.6
B15062	2.1	1.6	0.7	–	1.5
Nat. Museum Victoria					
W6769	2.5	1.6	0.9	1.7	1.7
B8778	2.3	1.8	0.8	2.3	1.615
W2340	2.3	1.7	0.8	2.3	1.6
W6680	–	1.7	0.85	Broken	1.625
W6466	2.25	1.8	0.8	Broken	1.6
Megaegotheles					
Canterbury Museum					
AV16,996*	2.75	2.1	1.0	2.0	1.8
AV5090*	2.6+	1.9	–	–	–
AV20,651*	–	1.525	–	–	–
Auckland Museum*	2.5+	1.7	–	–	–

* Sub-adult.

STERNUM

Aegotheles cristatus

	Length	Lenth along keel	Anterior width	Posterior width	Height Ant. Process to keel	Width of "waist"
S. Aust. Museum						
B10996	2.2	2.1	1.6	2.1	1.4	1.4
B11629	2.1	2.0	1.4	4.8	1.2	1.15
B10989	2.0	2.1	1.4	2.1	1.4	1.3
B15062	2.0	2.0	1.35	1.8	1.4	1.25
B11472	2.0	1.95	1.5	–	1.3	1.25
B10341	–	2.0	1.5	1.9	1.3	1.4
Nat. Museum Victoria						
W6769	2.2	2.2	1.625	2.0	1.35	1.4
W6680	2.2	2.15	1.5	1.9	1.4	1.3
W2136	2.2	–	1.45	1.8	1.4	1.3
W2340	2.15	2.1	1.45	2.0	1.4	1.4
W6585	2.1	2.1	1.45	2.15	1.5	1.3
B8778	2.05	2.0	1.5	2.1	1.3	1.45
B6806	2.0	2.2	1.5	1.9	1.5	1.35
W6466	2.0	1.95	–	1.85 (abnormal)	1.35	–
Megaegotheles						
AV16,728	2.4	1.975	2.1	2.2	1.25	1.6
AV16,996*	2.15	1.7	1.9±	2.1+	–	1.45
Auck. Museum*	2.1	1.7	1.7±†	1.8±†	–	1.6±†

† These measurements were obtained by measuring the complete half and doubling.

* Sub-adult.

FEMUR

Aegotheles cristatus (10 measured)	L.	P.	M.	D.
Maximum W6466	2.2	0.425	0.2	0.5
Minimum B1169	2.05	0.4	0.175	0.4

The smallest proximal width was from B15062, which measured 0.375. B11472 and B8778 each had a mean measurement of 0.15.

Megaegotheles Adult (mixed bones)	L.	P.	M.	D.
Maximum: AV17,333 Rt.	3.2	0.65	0.275	0.625
Minimum: AV17,333 Lt.	2.95	0.6+	0.275	0.625

AV16804, a distal end, had a mean measurement of 0.25 and a distal one of 0.6.

Sub-adult	L.	P.	M.	D.
Maximum AV16,996	3.025	0.6	0.25	0.6
Minimum AV20,651	2.325	0.475	0.2	0.475

TIBIOTARSUS

Aegotheles cristatus (9 measured)	L.	P.	M.	D.
Maximum W6680	3.8	0.35	0.2	0.4
Minimum B15062	3.5	0.35	0.15	0.3

(Five had a proximal width of 0.4)

Megaegotheles (6 measured)	L.	P.	M.	D.
Adult —				
Maximum AV16,638	6.6+	–	0.3	0.6
Maximum AV17,774	6.6	0.6	0.3	0.575
Minimum AV15,118	5.8	0.5	0.225	0.45

(Two had a mean width of 0.215)

Sub-adult —				
Maximum AV16,696	6.7	0.55	0.25	0.515
AV20,651	5.35	0.35	0.2	0.425

TARSO-METATARSUS

Aegotheles cristatus (9 measured)	L.	P.	M.	D.
Maximum W2340	2.4	0.4	0.15	0.4
Minimum W6568	2.1	0.4	0.15	0.4

(Four had a proximal width of 0.36, and one a mean of 0.2)

Dr. Warren Hitchcock kindly supplied me with length measurements of tarso-metatarsi of New Guinea form of *Aegotheles* made on skins in the collection of C.S.I.R.O., Canberra, and with similar data from the literature. These would of course be a little larger than those made on bones. These measurements combined with those given by Rand and Gilliard, give the following results (for species only). I have no data for the subspecies in the various groups.

LENGTH

A. cristatus	2.0 - 2.4
A. archboldi	Rand, Male 1.9 - 2.0; Female 2.0
A. bennetti	Salvadori and D'Albertisi, Male 2.0; Female 2.2
A. albertisi	Sclater, Male 1.6 - 2.2; Female 1.9 - 2.1
A. insignis	Salvadori, Male 1.8 - 2.2; Female 2.1 - 2.4
A. wallaci	Gray 1.5

Megaegotheles (10 measured)	L.	P.	M.	D.
Adult —				
Maximum AV18,012	4.925	0.6	0.25	0.625
Minimum AV18,241	4.35	0.525	0.215	0.55
Sub-adult —				
Maximum AV18,563	4.475	0.525	0.2	0.515
Minimum AV20,651	3.7	0.375	0.175	0.4

Of the adult bones, the greatest proximal width is 0.65 and the smallest distal width (on 4 bones) is 0.515.

HUMERUS

Aegotheles cristatus

Three individuals in the South Australian Museum, B11629, B11472, and B15062, aul had a length of 2.6, proximal width of 0.8, distal width of 0.6, but the mean was 0.25, 0.215 and 0.2 respectively. Six specimens in the National Museum of Victoria ranged from:

	L.	P.	M.	D.
Maximum W2340	2.75	0.75	0.2	0.65
Minimum B8778	2.675	0.8	0.225	0.55

Four of these had a proximal width of 0.8, two of 0.75 and the distal width ranged from 0.65 to 0.4.

For *Megaegotheles* the range of eleven adult humeri was:

	L.	P.	M.	D.
Maximum AV21,638	3.5	0.95	0.3	0.7
Minimum AV18,242	2.9	0.825	0.25	0.6

AV7242 had a proximal width of only 0.675.

OTHER WING BONES

The length of the other wing components of *Aegotheles cristatus* follows, with number measured in brackets: ULNA (7) 3.5 - 3.2; RADIUS (8) 3.25 - 3.1; CARPO-METACARPUS (9) 1.9 - 1.7.

Corresponding measurements for *Megaegotheles* are: (Sub-adult) ULNA (1) 3.285; RADIUS (2) 3.4 - 3.0; CARPO-METACARPUS Adult (AV16,640) 1.9; Sub-adult (2) 1.8 - 1.65.

SHOULDER GIRDLE

Aegotheles cristatus: Coracoid (10) 1.8 - 1.5; Scapula (10) 2.225 - 2.1.

Megaegotheles (Sub-adult): Coracoid (2) 1.875 - 1.6; Scapula (2) 2.575 - 2.35.

DETAILS OF THE HOLOTYPE FOLLOW: As stated above, it is sub-adult.

AV16,996		L.	P.	M.	D.	
Humerus:	R.	–	–	0.275	–	Defective at both ends
	L.	3.3	0.725	0.275	0.5	
Femur:	R.	3.025	0.6	0.25	0.6	
	L.	3.025	0.6	0.25	0.55	
Tibio-	R.	6.7	0.55	0.25	0.515	
tarsus:	L.	–	–	0.25	–	Defective at both ends
Tarso-	R.	–	–	0.2	–	Defective at both ends
metatarsus:	L.	4.5	0.52	0.2	–	Inner condyle absent

Right coracoid: Length 1.875. *Right scapula:* Length 2.575.

	Length	Sacral length	Anterior width	Posterior width	Width across Supra-trochanteric processes
Pelvis:	2.75	2.1	1.0	2.0	1.8

	Length	Length along keel	Anterior width	Posterior width	Height (Ant. process to Keel)	Width of "waist"
Sternum:	2.15	1.7	1.9±	2.1+	–	1.45

The other bones present are 3 vertebrae, 8 ribs, 1 sternal rib, 1 phalanx.

CONCLUSION

Megaegotheles has a much greater range in the size of the leg and wing components than has *Aegotheles,* but this is not unusual in New Zealand birds. Among living birds, for instance, Tui and Kakapo exhibit a similar variation, not all of which is due to difference in sex, while among extinct forms the N.Z. and Chatham Is. Coot, *Nesophalaris* (= *Palaeolimnas*) and the various species of Moa may be cited. Otherwise, the new genus is very much closer to *Aegotheles* than to any other of the *Caprimulgiformes* I have been able to examine.

On present evidence it would appear to have been extinct before the arrival of man, not having been found in human association. This is, admittedly, negative evidence, and further finds may modify this conclusion, but as it is nearly 100 years since the first bones of *Megaegotheles* were discovered, I do not consider that there is a great possibility that man saw this bird. The only dates that can be given are from Te Waka No. 1 Cave, Hawkes Bay, where it was present before 1480 B.C. and ranged to before 50 A.D. and from Pyramid Valley, where the contents of three Moa gizzards and a skeleton from an early level ranged from 1790 to 1500 B.C., although this of course does not date the *Megaegotheles* bones from this swamp, which built up for many centuries.

FOOTNOTE:

Since writing this paper, another locality has been added. AV 22,247, a left humerus and R. posterior ramus of mandible, were collected, among thousands of bird bones, in Harrison's Hole, Ruakokopatuna, Martinborough, in 1968, by John Marston.

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SHORT NOTES

SOME HAZARDS FOR EARLY NESTING PIED STILTS

In spite of the inclement weather of the 1968 winter, Pied Stilts *(H. leucocephalus)* began to nest early in Ardmore.

The first nest, of four eggs, was found at 11 a.m. on June 19. It seemed that incubation was in progress so that the eggs were probably laid during the first week of June. The nest was carefully watched up to June 29, when heavy rain brought a flood which washed away the eggs. A search failed to reveal any of the washed out eggs. The parents were no longer present. No other Stilts were seen during the time the nest was watched.

A pair, presumed to be the same, returned to the area three days after the loss of the nest, and remained. No others came. On July 16 the second nest of this pair was found, there being three eggs at 5.15 p.m. Next evening there were four eggs. The nest was empty at 5 p.m. on July 22. During the morning of the 21st, the owners of the farm saw a party of about eight Stilts attacking four Pukeko at the site of the nest. Pukeko footprints were left in the mud beside the nest. No egg-shells were found. The further six Stilts, not previously seen, must have come from some distance to aid the nesting pair. The nesting pair stayed closely by the nest and remained in the general area for several days.

During the first week in August three other birds were about but were not present when the third nest of two eggs was found on August 11. Two further eggs were laid on the 12th and 13th. On August 15 the nest had been robbed, obviously by Pukeko, which had left footmarks at this nest also. There were small pieces of egg-shell in and by the nest and a small amount of albumen in it.

It is almost certain that the same pair nested the three times. One of the pair had a distinct black collar. No other Stilt seen had this distinguishing feature. About two weeks later they returned but did not nest again.

— SUSAN FOGARTY