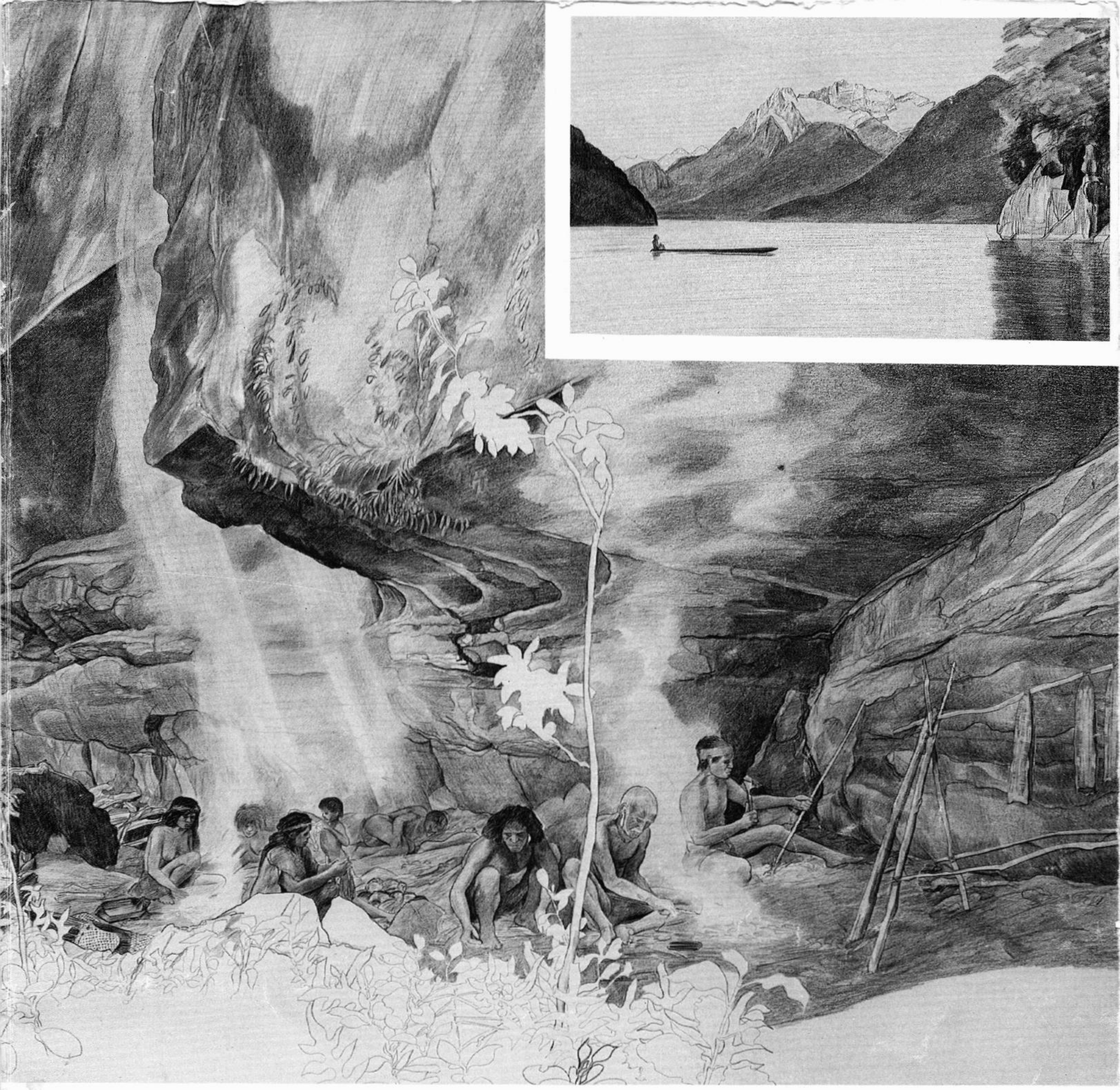
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION MONOGRAPH 18: Atholl Anderson and Richard McGovern-Wilson (eds), *Beech Forest Hunters*



Beech Forest Hunters

Edited by
Atholl Anderson and Richard McGovern-Wilson

New Zealand Archaeological Association Monograph 18

IDENTIFICATION AND ANALYSIS OF FAUNAL REMAINS

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The dry environment of the rockshelters facilitated preservation of various faunal remains including skin, feathers and hair (see Chapters 7 and 8), but bones, predominantly bird bones, were particularly abundant, especially in S131/4. Some molluscan shell occurred in all sites, but was relatively abundant only in S131/6.

Most of the bones had been burnt or charred, and this seems to have rendered the more delicate elements, such as avian vertebrae, furculae, sterna and pelves, particularly vulnerable to fragmentation by trampling or other agencies. At any rate, relatively few of these elements could be distinguished to a degree suitable for estimating the minimum number of individuals (MNI) amongst the residue of fragmented bone in the material recovered for analysis (this consisted of all bone retained by 2 mm mesh sieves, which were used wherever bone was apparent, plus whole samples of about 2 litres from each metre square and layer). The relative scarcity of these in identified remains, consequently, offers no support for or against hypotheses about patterns of return, processing or subsequent removal of preserved birds from the sites. The main avian leg and wing bones, coracoids and premaxillae, and the main jaw bones of fish, however, probably provide reliable MNI unless there are taphonomic factors, as yet unknown, which affect differentially the survival of small bird and fish bones in New Zealand rockshelters.

The mammal bones, some fish bones, and about a third of the bird bones were identified by reference to the comparative collection in the Anthropology Department, University of Otago. Once sorted for anatomy, the majority of the bird bones were identified at the National Museum by Dr Phillip Millener. Apart from several clearly identifiable pieces, the fish bone was identified by Dr Robert McDowall, Fisheries Research Division (M.A.F.). Lizard and frog bones were identified by Mr Graham Hardy, National Museum, and Mr Trevor Worthy, Department of Conservation, and insect remains by Dr Warren Thomas of Entomology Division, D.S.I.R.

Table 6.1. Lee Island dog remains.

Site	Provenance	Bone	Portion
S131/4	B9 Layer 2	metapodial	prox. frag.
	C5 Layer 2	canine	frag.
	C7 Layer 1	R. humerus	shaft frag.
	C9 Surface	R. tibia	dist. frag.
	C9 Layer 2	metapodial	dist. frag.
	C9 Layer 2	R. mandible	ascend. ramus frag.
	C9 Layer 2	ribs (5)	shaft frags.
	C9 Layer 2	scapula	spine frag.
S131/6	D2 Layer 2	L. tibia	shaft frag.
	D6 Layer 2	tibia	shaft frag.

NON-AVIAN TAXA

Tables 6.1 and 6.2 present the results of identification of mammal and fish bones.

Mammal remains

All the mammal remains are from small dogs (Table 6.1). Since the epiphyses are fused on the metapodial and tibial fragments in the S131/4 remains the individual was at least 14-15 months old, according to data in Cornwall (1964:229). Another small dog is represented in S131/6. It is possible that the remains in both sites are from the same individual. Since all the bones are broken and most show signs of burning, it is likely that the dog (or dogs) was eaten.

Fish remains

The fish remains (Table 6.2) mainly consist of vertebrae. Only one of these was sufficiently undamaged to be clearly identifiable as from an eel (*Anguilla* sp.) but the remainder are of a size and shape consistent with either *Anguilla* sp. or native trout (*Galaxias* sp.) according to McDowall (pers.comm.). The assemblage in S131/6 indicates one individual, although possibly only a portion of food, of a probable eel or native trout.

In S131/4 cranial bones indicate that there is at least one individual each of the long-finned eel (*Anguilla dieffenbachi*) and of one of the native trout or kokopu (*Galaxias* sp.). The size of the quadrate suggests one of the large species such as the giant kokopu (*G. argenteus*). The cranial bones are unburnt but most of the vertebrae have been scorched or burnt and in S131/4 they are distributed into three broad patches: 45 vertebrae in Squares D5, D6, D7, C5 and C6 - that is, on the slope above and adjacent to the middle scoop hearth; 17 vertebrae in B9, C8 and C9 which is an area adjacent to the upper hearth; and 10 vertebrae in C2, beside the lower hearth. These facts could be interpreted as meaning that in S131/4 the heads were removed from two fish, and the bodies were

Table 6.2. Lee Island fish remains.

Note: * = identification by A.J. Anderson, others by R.M. McDowell.

Site	Provenance	Bone	Identification
S131/4	A8 Layer 2	parasphenoid	*Anguilla* sp. *
	B2 Layer 2	1 vertebra	fish unid.
	B3 Layer 2	palatine or maxilla	fish unid.
	B5 Surface	2 vertebrae	fish unid.
	B6 Layer 2	2 vertebrae	fish unid.
	B7 Layer 1	preopercular	*Galaxias* sp.
	B7 Layer 2	quadrate	*Galaxias* sp.
	B7 Layer 2	1 vertebra	fish unid.
	B9 Layer 2	3 vertebrae	fish unid.
	C1 Layer 2	1 vertebra	fish unid.
	C2 Layer 2	10 vertebrae	fish unid.
	C3 Layer 1	1 vertebra	fish unid.
	C3 Layer 2	parasphenoid	fish unid.
	C4 Layer 1	3 vertebrae	fish unid.
	C5 Layer 1	4 vertebrae	fish unid.
	C5 Layer 2	2 vertebrae	fish unid.
	C6 Layer 1	5 vertebrae	fish unid.
	C7 Layer 1	1 vertebra	fish unid.
	C7 Layer 1	1 vertebra	*Anguilla* sp. *
	C8 Layer 1	vomer	*Anguilla dieffenbachi*
	C8 Layer 2	4 vertebrae	fish unid.
	C9 Layer 2	10 vertebrae	fish unid.
	D5 Layer 2	6 vertebrae	fish unid.
	D6 Layer 1	8 vertebrae	fish unid.
	D7 Layer 1	16 vertebrae	fish unid.
	D7 Layer 2	4 vertebrae	fish unid.
S131/6	C3 Layer 2	1 vertebra	fish unid.
	D2 Layer 2	12 vertebrae	fish unid.

cut into three pieces and broiled; at each of the hearths a piece was consumed, and the remains cast into the fire then scattered nearby by trampling etc.

Reptile and amphibian remains

From S131/4 were recovered a left humerus (C5, Layer 1) and a right humerus (C7, Layer 2) of a large native frog. This material has been identified as belonging to the new species, *Leiopelma markhami*. The reptile remains comprised dessicated corpses of a skink (S131/4, C1, Layer 2), probably *Leiolopisma grande*, and a gecko (S131/6, B6, Layer 2), probably *Hoplodactylus macrolatus* (Worthy pers.comm.). It is unlikely that the frog or lizard bones are midden remains, and there is certainly no evidence to suggest that on the bones themselves (i.e. no burning or breakage). It is much more likely that they are from animals which died in the site.

Insect remains

Fused elytra of native beetles of *Enarsus* sp. (Coleoptera) were recovered from S131/4 (C2, Layer 2) and S131/6 (D4, Layer 2) and a pupal cocoon of a native bee (Hymenopteroa) from S131/4 (E5, Layer 2). These are common taxa and have no cultural significance.

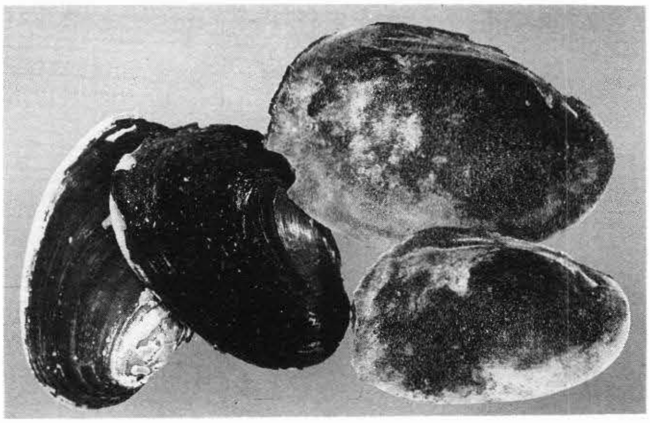


Figure 6.1. *Hyridella* valves from S131/4.

Shellfish remains

Nearly all the shell consisted of *Hyridella* sp. (Fig. 6.1), the freshwater mussel or kakahi, but there was also a right valve of the marine species *Mactra discors*, excavated as three interlocking fragments from S131/6.

Identification was accomplished using Powell (1979), with the help of Mr G.M. Mason (Anthropology Department, University of Otago). Although all of the same general form, the mussel shells showed a considerable variation in shell size, shape and thickness. Dell (1953:222) comments that this variation is typical of the species, individuals often differing within one region. Powell (1979:384) describes a single species (*Hyridella menzeisi*) but notes that it occurs in a number of different ecotypes.

The material was divided into identifiable remains and fragments. From the former, valves with hinge remains that had the majority of the cardinal and

Table 6.3. Minimum number of identifiable *Hyridella* valves with hinge portion, by layer.

Site	Provenance	Number	Left or right valve
S131/4	Surface	4	R
	Layer 1	2	R
	Layer 2	4	L
		10	R
	Lens B	1	L
		1	R
	Total	5	L
		17	R
S131/6	Surface	8	L
		10	R
	Layer 2	16	L
		12	R
	Total	24	L
		22	R

Minimum number per site (sum of maximum for each layer)

S131/4	17
S131/6	26

Table 6.4. Length and weight of complete *Hyridella* valves.

	Length (mm)	Weight (g)
S131/4		
Layer 1	59	3.8
Layer 2	70	7.3
	90	21.2
	86	15.9
	78	10.0
	54	2.7
	113	47.9
S131/6		
Surface	74	11.1
	73	11.8
	77	13.0
	72	9.9
	81	16.0
	77	12.0
	76	11.5
	88	18.5
	80	13.2
	84	15.9
	89	19.9
	72	10.1
	78	16.3
	74	10.2
Layer 2	77	8.9
	60	5.4
	90	15.1
	77	13.3
	94	21.7
	59	5.3
	84	15.3
	109	42.4
	76	12.1
	79	11.1
	105	20.3
	94	34.8

Weight of *Hyridella* fragments

S131/4	Surface	13.6	S131/6	Surface	0.7
	Layer 1	15.8		Layer 2	159.8
	Layer 2	53.0			
	Lens B	10.7			

Weight of undiagnostic shell fragments

S131/4	Surface	15.5	S131/6	Surface	0.2
	Layer 1	50.4		Layer 2	20.7
	Layer 2	32.2			
	Layer 3	0.3			
	Lens A	2.5			
	Lens B	0.2			

lateral teeth intact were counted for minimum number estimates, and identified as either left or right valves. All shell remains were weighed by square and layer, and length measurements were taken on the complete valves. Results are given in Tables 6.3-4 where MNI are also shown. Identifiable complete, or near complete, valves were examined by Ms Wendy Harsant (Otago Museum) for evidence of edge damage.

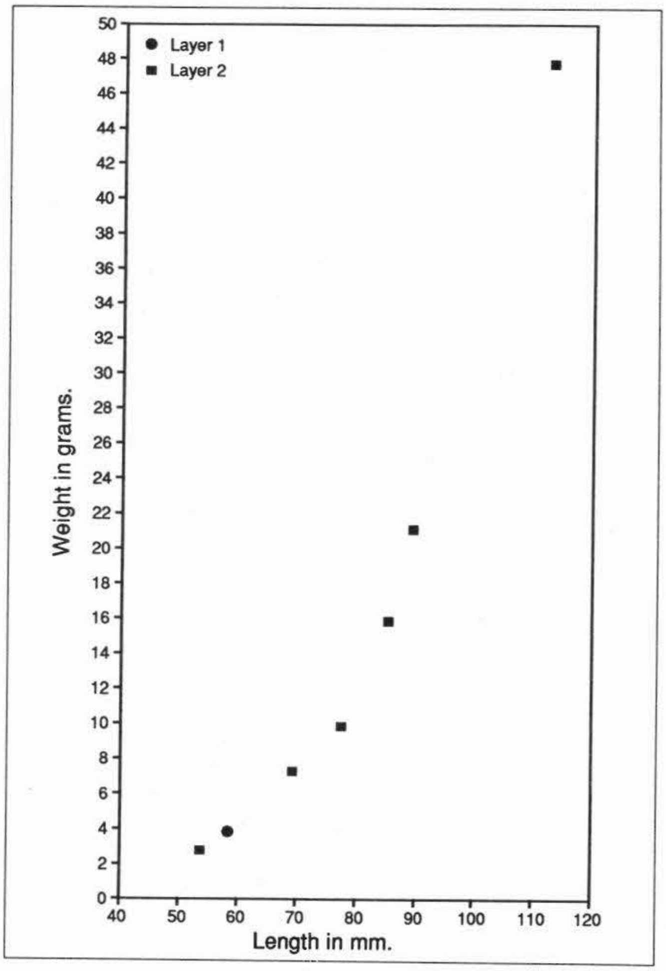


Figure 6.2. Weight versus length of complete *Hyridella* valves, S131/4.

Although the number of complete valves found from both sites was not large, measurement of the length and weight of each revealed some interesting differences between upper and lower layers. A number of unusually long shells from Layer 2 in both S131/4 and S131/6 weighed considerably above the average (Figs. 6.2-3). These data may reflect various factors, but it is unlikely, given the very small numbers involved, that the size-variation by layers reflects any effect of sustained exploitation. Perhaps the most likely explanation is that heavier shells were less easily dislodged into the loose surface layer by trampling.

None of the valves examined by Harsant showed edge damage consistent with use as scrapers. A number were slightly damaged but weathering or post excavation trauma is a likely cause. It is possible that some of the shells were intended for use as scrapers, but were never used, and that some of the smaller, thin-edged shells were suitable for cleaning flax. However, the larger shells had edges which were too thick to be successfully used as scrapers. The edge of the *Mactra discors* valve was too weathered to draw any conclusion about edge damage.

A total of 43 freshwater mussels is very small when compared to the MNI in most marine shell

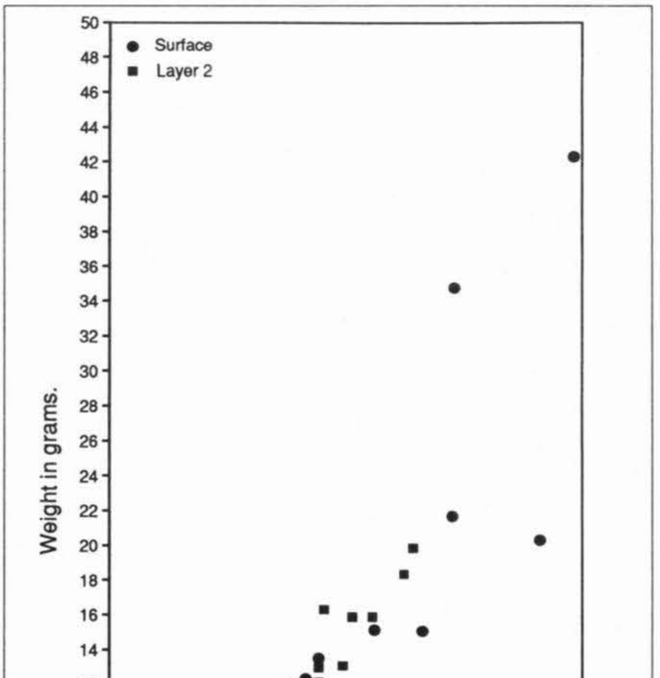


Figure 6.3. Weight versus length of complete *Hyridella* valves, S131/6.

middens but only small numbers of freshwater mussels have been reported elsewhere, for example, from Italian Creek in the Cromwell Gorge (Ritchie 1982). Ritchie concluded that freshwater mussels were not of major economic importance, and this is further supported by nutritional analysis of two species of freshwater mussel. Parmalee and Klippel (1974) concluded that freshwater mussels were unlikely to have formed a major prehistoric food resource when compared to other fauna.

Not only were mussels of low nutritional value, but they were not very tasty either. Best (1929:229) describes them as 'insipid'. Te Rangi Hiroa (1921:445) comments that:

> "It is curious that the kakahi, or fresh-water mussel, whilst the least appetizing of the lake food-supplies, is the most important in story, song, and proverb. For instance, there is an old saying - Tane moe whare, kurua te takataka; tane rou kakahi, aitia te ure (Man drowsing in the house, smack his head; man skilled in dredging kakahi, marry him)."

He goes on to give a detailed description of the construction and use of the dredge rake (kapu or mangakino) used to take the mussels which live beneath the mud in lake or river beds (Powell 1976:69).

The difficulty in taking freshwater mussels, coupled with their low nutritional value and poor taste, begs the question of why they were collected at all. Te Rangi Hiroa (1921:450), however, notes that the cooked visceral mass of the freshwater mussel was regarded as an important food for motherless infants, and presumably infants whose mothers could no longer produce milk. The cooked mussels were also sought after by the sick.

There is nothing in the Lee Island sites which offers any clues in regard to these historical uses and we can only conclude that the freshwater mussels were taken casually for variety in the food supply. They may have been collected at Safe Cove, where they are known to occur today.

BIRD BONES

Representation of species

In Tables 6.5-7 are the results for identification of bird bone. The latter data are presented by stratigraphic units, as distinguished during excavation, and are then combined for each site since a single occupation in each case is inferred from other evidence (see Chapter 2). In collating identification data, MNI were calculated according to the method outlined by Leach (1976:Appendix 21; 1979:103-106). The raw data are listed in Appendix 1.

The remains from S131/3 (Table 6.5) indicate the exploitation of one main species, kaka (*Nestor m. meridionalis*), with the other forest species probably being taken at the same time. The presence of mottled petrel (*Pterodroma inexpectata*) is interesting because it is mainly a pelagic species which usually breeds on offshore islands around Stewart Island and the Snares (Falla et al. 1978:42; Robertson 1985: 76). There are only two bones from this species, however, so it is possible that they are the remains of preserved food brought to the site from the coast.

Table 6.5. Minimum numbers of birds from S131/3.

Note: nomenclature after Falla et al. (1978).

Species	Surface	L. 1	L. 2	Combined
Nestor m. meridionalis	5	2	15	18
Hemiphaga novaeseelandiae	-	-	2	2
Cyanoramphus novaezelandiae	-	-	1	1
Prosthemadera novaeseelandiae	-	-	1	1
Pterodroma inexpectata	-	-	1	1

The range of species in S131/4 (Table 6.6) shows a much wider exploitation of forest and wetland birds with specialised hunting directed toward New Zealand pigeon (*Hemiphaga novaeseelandiae*), kaka, red-crowned parakeet (*Cyanoramphus novaezelandiae*) and to a lesser extent in terms of MNI, kakapo (*Strigops habroptilus*). Mottled petrel is represented in this site also, by a larger number of bones, and the presence of an immature specimen suggests the possibility of a breeding population in the inland lakes area. While this is uncommon, mottled petrels do breed on an island in Lake Hauroko (Falla et al. 1978:42; Robertson 1985:76), and once did elsewhere in mountainous areas of the North and South Islands. W. Cooper (pers. comm.) suggests that the Waiau River is used as a petrel 'corridor' up the eastern side of the mountains of southern Fiordland to the lakes and beyond, so colonies at Lake te Anau would not be unexpected. The other explanation for the immature specimen is that it had been preserved and brought to the site as food.

There is a range of species represented by only one or two individuals which are probably the remains of birds caught to supplement the diet while the occupants of the rockshelter were catching and preserving the four main species. Most of the forest and wetland species represented (Table 6.6) are still present in the Lee Island area today (see Chapter 1). The yellowhead (*Mohoua ochrocephala*) present in the site is probably not an archaeological specimen since most of the skeleton was recovered still in articulation. It is probably the remains of an individual which died in the site after the archaeological remains were deposited.

Table 6.6. Minimum numbers of birds from S131/4.

Notes: 1. nomenclature after Falla et al. (1978); 2. figures in brackets denotes an immature specimen.

Species	Surf.	Lens B	L. 1	L. 2	Combined
Hemiphaga novaeseelandiae	4	1	9	21	29
Nestor m. meridionalis	3	4	11	13	29
Cyanoramphus novaezelandiae	3	15	9	15	28
Strigops habroptilus	1	1	3	7	9
Pterodroma inexpectata	-	1	2	3(1)	4(1)
P. nigripennis	-	-	-	2	2
Falco novaeseelandiae	-	-	1	-	1
Ninox novaeseelandiae	-	-	-	1	1
Anas superciliosa	-	-	1	-	1
A. gibberifrons	1	-	-	-	1
A. sp.	-	-	-	1	1
Aythya novaeseelandiae	-	1	-	-	1
Podiceps cristatus	1	-	1	-	1
Prosthemadera novaeseelandiae	-	1	-	2	2
Anthornis melanura	-	-	1	1	1
Petroica a. australis	-	-	-	1	1
Mohoua ochrocephala	-	-	1	-	1

The remains from S131/6 (Table 6.7) also exhibit the exploitation of one main species, kaka, and the catching of other forest species. The diving petrel (*Pelecanoides u. urinatrix*) is another specimen that probably died in the site as its left wing and left leg were still in articulation with some tendons still attached (Fig. 6.4). The separation of parakeets into red-crowned and yellow-crowned species is based on the more gracile appearance of yellow-crowned parakeets (*Cyanoramphus auriceps*) although the size range of male yellow-crowned overlaps with that of the female of red-crowned (Falla et al 1978: 165; Oliver 1955:556, 561). These identifications should be regarded, therefore, as tentative. Weka (*Gallirallus a. australis*) does not occur on the island today, but is found in the Safe Cove area (K. Morrison pers.comm.). Since weka swim readily (Falla et al 1978:97) to recorded distances of up to 900 m (Robertson 1985:168), the remains in this site may be of birds taken on the island.

Table 6.7. Minimum numbers of birds from S131/6.

Notes: nomenclature after Falla et al. (1978).

Species	Layer 2
Nestor m. meridionalis	11
Gallirallus a. australis	2
Cyanoramphus novaezelandiae	2
C. auriceps	2
Pelecanoides u. urinatrix	1

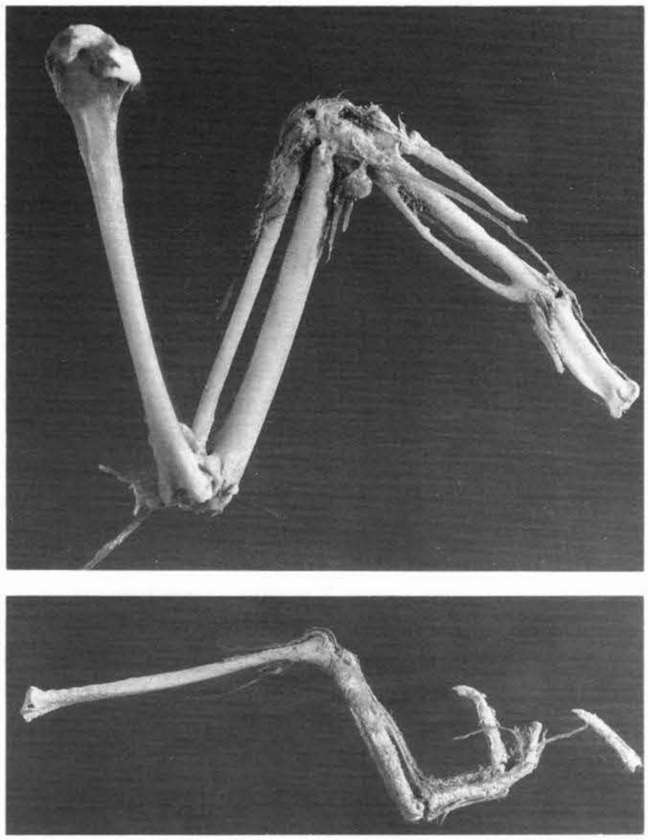


Figure 6.4. Remains of diving petrel in S131/6. A: articulated left wing; B: left leg.

Representation of body parts

Patterns in the representation of body parts and in bone breakage provide clues to the nature of carcass processing. The relevant data are shown in Tables 6.8-11 and selected elements in Figures 6.5-7. They are discussed here by species (see also Anderson 1988).

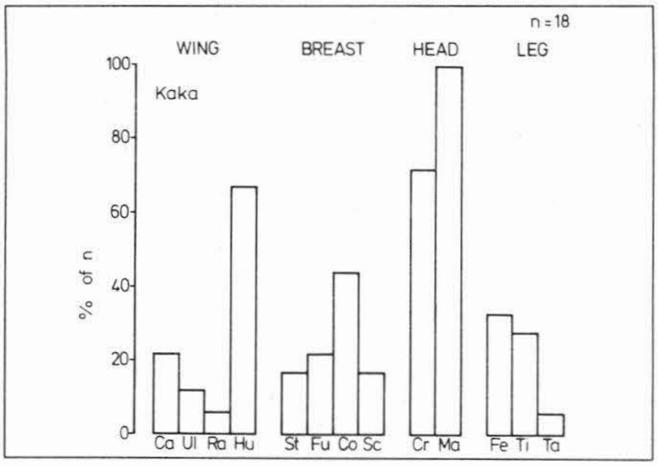


Figure 6.5. Body parts representation of kaka, in S131/3 (layers combined).

Table 6.8. Kaka remains from the Lee Island sites. Minimum numbers for different parts of the anatomy expressed as a percentage of the maximum minimum number.

Anatomy		S131/3 combined	S131/4 combined	S131/6
Carpometacarpus	L	11.11	6.90	0
	R	22.22	3.45	9.09
Ulna	L	11.11	6.90	0
	R	16.67	6.90	0
Radius	L	0	6.90	0
	R	5.56	3.45	0
Humerus	L	66.67	34.48	27.27
	R	61.11	55.17	100.00
Coracoid	L	33.33	37.93	36.36
	R	44.44	41.38	27.27
Femur	L	11.11	41.38	0
	R	33.33	24.14	0
Tibiotarsus	L	27.78	62.07	0
	R	27.78	100.00	18.18
Tarsometatarsus	L	5.56	51.72	0
	R	5.56	44.83	27.27
Sternum		16.67	13.80	18.18
Furcula		22.22	13.80	18.18
Pelvis		11.11	24.14	0
Cranium		72.22	51.72	63.63
Mandible		100.00	24.14	36.36

Kaka (Table 6.8, Fig. 6.8). In the material from S131/3 and S131/6 wing and leg extremities are generally missing; the outer wing having been detached at the proximal ulna joint. Since there is very little meat on these body parts, they were probably removed before the birds were brought back to the site. Humeri are substantially more abundant than femora, particularly in S131/6, and this suggests that most carcasses were removed from the sites with the upper leg intact, but the upper wing either detached or the bone butchered out. It is possible, of course, that some of the upper legs were discarded prior to the return of the birds to the sites, but if that was so, then it can hardly have been meat that the fowlers were seeking. There are

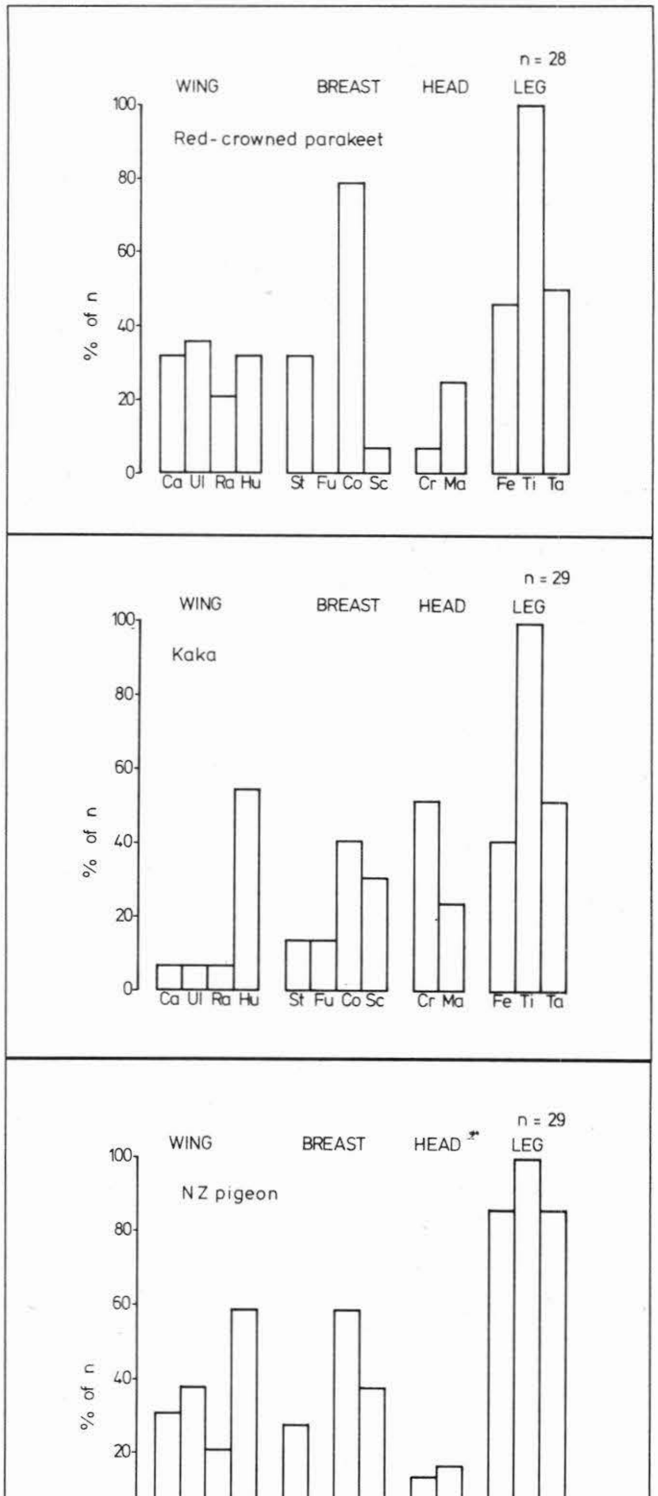


Figure 6.6. Body parts representation of kaka, red-crowned parakeet, and N.Z. pigeon in S131/4 (layers combined).

relatively few mandibles present, possibly because they were left attached to preserved carcasses as a means of identifying and counting birds of particular species (Best 1942:275; Firth 1959:164). In any event, the bone discard patterns in these two sites suggest the trimming of meatless appendages and the removal of most of the carcassses, possibly as preserved food.

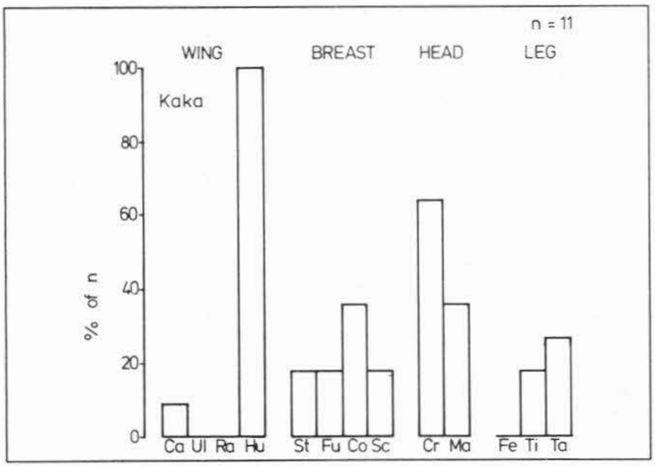


Figure 6.7. Body parts representation of kaka in S131/6.

The remains in S131/4 differ somewhat in that although the wing extremities were probably left in the forest, the lower legs were certainly returned to the site. Femora and humeri are also relatively more abundant. This pattern might reflect only a transitory variation in behaviour, for example that kaka were being caught in large numbers close-by which made it more efficient to delay the removal of the lower legs until the catch was returned to the site.

A common factor in the kaka remains from all three sites is the general lack of sterna and pelvi, possibly because they remained in preserved carcasses.

Parakeet (Table 6.9, Fig. 6.9). The parakeet remains from S131/4 show no real patterns except

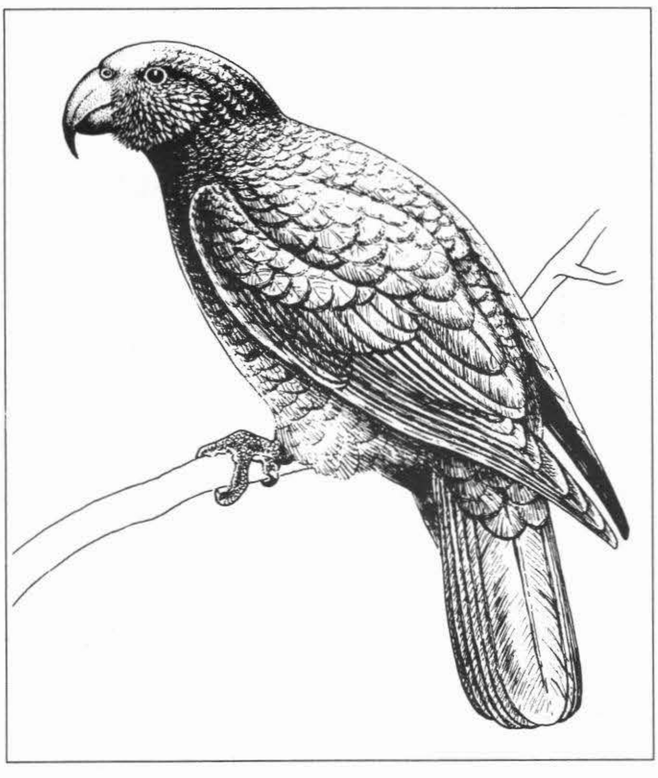


Figure 6.8. Kaka *(Nestor meridionalis)*. Body length ca. 450 mm, body weight ca. 600 g.

Table 6.9. Red-crowned parakeet remains from S131/4. Minimum numbers for different parts of the anatomy expressed as a percentage of the maximum minimum number.

Anatomy		S131/4 combined
Carpometacarpus	L	17.86
	R	32.14
Ulna	L	35.71
	R	21.43
Radius	L	21.43
	R	10.71
Humerus	L	28.57
	R	32.14
Coracoid	L	78.57
	R	53.57
Femur	L	46.43
	R	46.43
Tibiotarsus	L	96.43
	R	100.00
Tarsometatarsus	L	50.00
	R	46.43
Sternum		32.14
Furcula		0
Pelvis		39.29
Cranium		7.14
Mandible		25.00

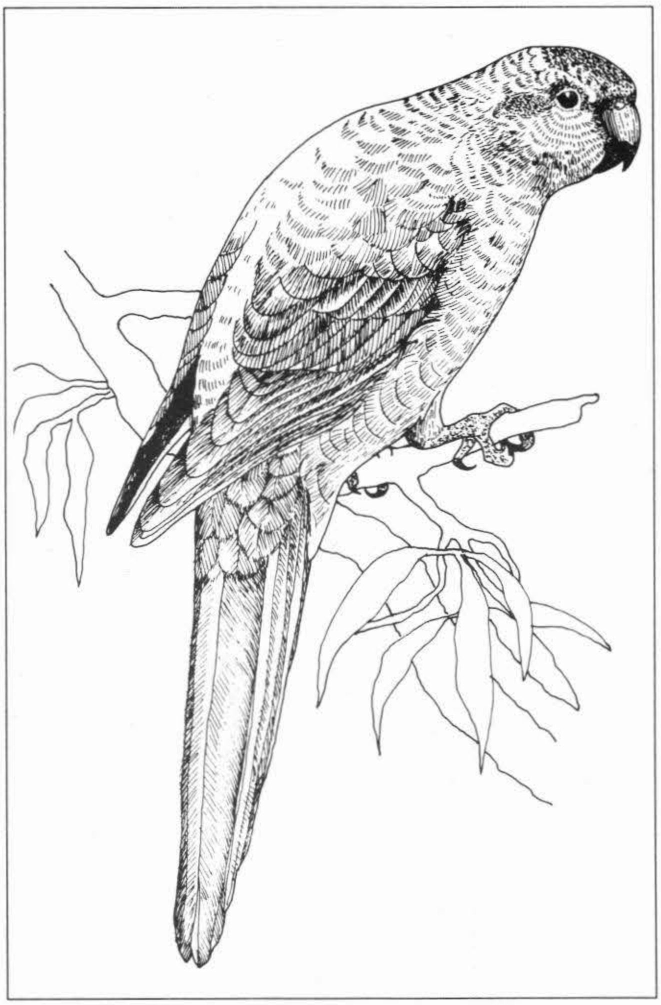


Figure 6.9. Parakeet (*Cyanorhamphus* sp.). Body length ca. 270 mm, body weight ca. 60 g.

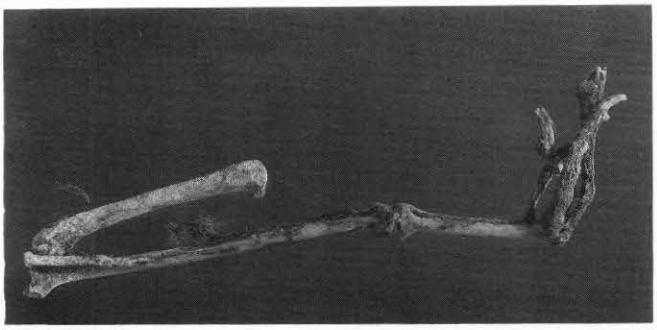


Figure 6.10. Articulated left leg of a red-crowned parakeet in S131/6.

to suggest that most of the wings were removed from the birds before they were returned to the site. Once there, most tibiotarsi and tarsometatarsi were detached (Fig. 6.10). A possible reason why the parakeets were returned to the site with their legs intact is that as 'walking' birds they had more meat and feathers on the lower leg than on 'hopping' species, such as the tui (Leach 1979: 120). Perhaps the most interesting point about the parakeet remains is the lack of crania. This might be attributed to removal of whole heads for plucking elsewhere of the sought-after red feathers on the crown (cf. Leach 1979:120).

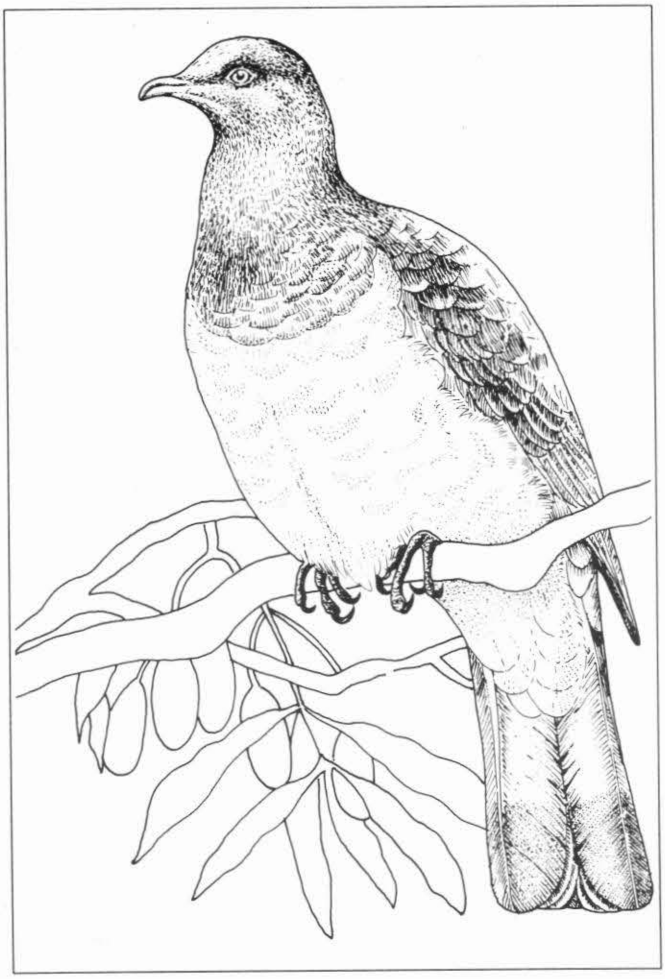


Figure 6.11. Pigeon (*Hemiphaga novaeseelandiae*). Body length ca. 510 mm, body weight ca. 750 g.

Pigeon (Table 6.10, Fig. 6.11) The pigeon remains in S131/4 show a general lack of wing extremities, mandibles and crania. The presence of most of the leg elements in the site may reflect preparation of the birds in the manner recorded by Best (1942:275). From a slit in the base of the neck the entrails were removed, the meat was stripped from the bones and the leg bones were pulled through and discarded.

Table 6.10. N.Z. pigeon remains from S131/4. Minimum numbers for different parts of the anatomy expressed as a percentage of the maximum minimum number.

Anatomy		S131/4 combined
Carpometacarpus	L	27.59
	R	31.03
Ulna	L	24.14
	R	37.93
Radius	L	20.69
	R	20.69
Humerus	L	44.83
	R	58.62
Coracoid	L	41.38
	R	58.62
Femur	L	75.86
	R	86.20
Tibiotarsus	L	100.00
	R	100.00
Tarsometatarsus	L	86.20
	R	79.31
Sternum		27.59
Furcula		0
Pelvis		65.52
Cranium		13.79
Mandible		10.34

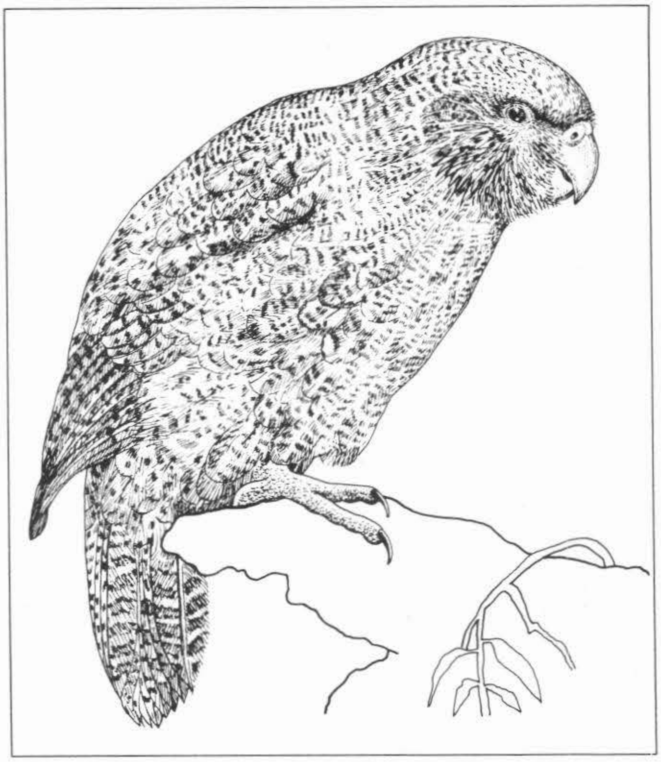


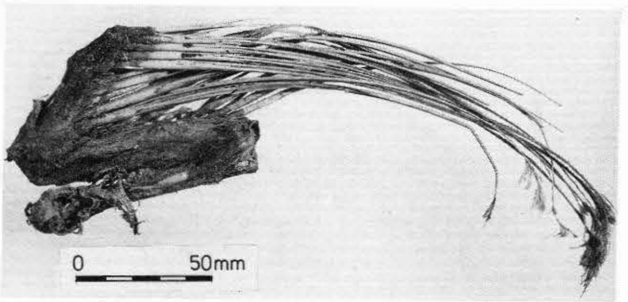
Figure 6.12. Kakapo (*Strigops habroptilus*). Body length ca. 630 mm, body weight ca. 2500 g.

In the case of the pigeons, the fact that 90% of the mandibles are absent can probably be attributed to their use as suggested above.

Kakapo (Table 6.11, Fig. 6.12). Apart from a left wing found in a state of articulation (and with the feathers still attached; Fig. 6.13) there were no lower wing elements present in S131/4. In fact, there were few remaining body parts at all when compared to at least 20 individuals represented by tail feathers recovered from the same site (Chapter 7). Assuming that the carcasses were returned to the site and then removed as preserved birds, it seems likely that the greater trimming of unwanted body parts after capture reflects the unusual weight or bulk of this species compared to the others.

Table 6.11. Kakapo remains from S131/4. Minimum numbers for different parts of the anatomy expressed as a percentage of the maximum minimum number.

Anatomy		S131/4 combined
Carpmetacarpus	L	11.11
	R	0
Ulna	L	11.11
	R	0
Radius	L	11.11
	R	0
Humerus	L	44.44
	R	11.11
Coracoid	L	0
	R	11.11
Femur	L	11.11
	R	11.11
Tibiotarsus	L	44.44
	R	100.00
Tarsometatarsus	L	33.33
	R	0
Sternum		33.33
Furcula		0
Pelvis		11.11
Cranium		33.33
Mandible		55.55



Breakage patterns

Data concerning breakage patterns in the main samples are shown in Tables 6.12-13. In the case of kaka at S131/4, the main point to notice is the large number of tibiotarsal shafts, indicating that some dismemberment processes concentrated in this area. They were, probably, the breaking-off of most lower legs in the field, a process which often seems to have taken distal tibiotarsi as well as tarsometatarsi, and later trimming back to the femur, though often not sufficiently to remove proximal ends of tibiotarsi. Amongst pigeons at S131/4, most femora and tarsometatarsi were detached whole and the breakage concentrated, again, on the tibiotarsi. The pattern is very similar, as well, in the case of S131/4 parakeets.

Spatial distribution

The distribution of species and bones within S131/4 also presents some interesting results. Almost 40% of the parakeet remains were found beside the hearths on the lower terrace - the area recorded as lens B during the excavation. On the middle terrace, conversely, a large number of bone fragments of a wide range of species was recovered in and around the hearths. Downes (1928:9) records that during the preservation of birds, the entrails and some of the bones which had been removed from the birds were eaten. The bones recovered in and around the hearth are possibly these remains which, along with the wide range of wetland and forest species represented by only one or two individuals (Table 6.6), provided the food for the occupants of the site while they were preserving most carcasses of the four main species for later consumption.

DISCUSSION OF AVIFAUNAL REMAINS

The Lee Island shelters were essentially fowling sites. One or possibly two dogs were cooked there,

Table 6.12. Breakage patterns for kaka, pigeon and parakeet in S131/4.

Note: C = complete, P = proximal, S = shaft, D = distal.

Bone	Kaka				Pigeon				Parakeet			
	C	P	S	D	C	P	S	D	C	P	S	D
Humerus	6	16	16	12	14	16	6	15	7	8	0	9
Ulna	1	0	1	2	5	12	1	10	12	4	0	4
Carpometacarpus	1	0	0	2	7	10	0	7	11	2	0	1
Femur	9	10	4	8	29	16	1	5	17	8	0	6
Tibiotarsus	10	10	32	11	28	17	0	30	16	17	3	39
Tarsometatarsus	11	6	10	11	37	10	2	9	20	2	1	7

Table 6.13. Breakage patterns for kaka in S131/3 and S131/6.

Note: C = complete, P = proximal, S = shaft, D = distal.

Bone	S131/3				S131/6			
	C	P	S	D	C	P	S	D
Humerus	21	2	0	0	5	2	1	8
Ulna	5	0	0	0	0	0	0	0
Carpometacarpus	5	0	0	1	0	0	0	1
Femur	7	0	0	1	0	0	0	0
Tibiotarsus	6	2	0	3	0	0	0	2
Tarsometatarsus	2	0	0	0	2	1	0	0

and several fish, but at least 154 birds comprise the main faunal component. Amongst these, parrots (parakeets, kaka and kakapo) are highly predominant (65% of MNI), followed by the N.Z. pigeon (20% of MNI). If meat-weight was the major consideration, then parrot-hunting from S131/4 probably concentrated upon the kakapo for, although there are only nine counted by MNI, there are at least 20 counted by tail feathers, and at a mean 2500 g liveweight (Best and Powlesland 1985:3) the latter number would provide three times the meat weight of kaka (mean live-weight 600 g), and to a lesser extent of pigeon (at a mean live-weight of 750 g: data from Sutton 1979:Appendix 2.2), and about 30 times the meat weight of parakeets (mean live-weight about 60 g). Parakeets, in fact, would provide so little food - perhaps only one kilo of meat from the whole catch - that it is more likely that they were sought mainly for their plumage.

It is difficult to show conclusively that preservation of bird carcasses was a major objective of fowling from the Lee Island shelters, but several considerations certainly suggest so. The scarcity of kakapo bones relative to tail feathers indicates that most individuals were either consumed elsewhere or were transported out of the site as preserved carcasses, having entered it fully trimmed. In the case of kaka, bone representation and breakage patterns suggest the trimming of carcasses for preservation, rather than merely the discard of meatless appendages in advance of consumption on the site. Thus the scarcity of kaka femora relative to humeri indicates that the meaty upper legs left the site while the upper wings remained. Similarly, the frequency of breakage at each end of tibiotarsi suggests two phases of trimming in which carcasses had the lower legs roughly detached at first and then further trimmed back later so that no sharp bones would stick out of the packaged meat. There are, as well, some artefactual remains which were probably associated with preservation: the drying racks in S131/3 and probably in S131/4, a fragment of a wooden bowl from S131/4, and the bark container from S131/5.

The general absence of bones representing pigeon and parakeet heads, and of kaka wings, compared to the relative abundance of those representing kaka heads and pigeon and parakeet wings, suggests that hunting for plumage was also an important consideration. The bright green head and neck feathers of pigeons, the bright green and red head and neck feathers of parakeets, and the scarlet underwing coverts and axillaries of kakas may have been sought as decoration for cloaks or other such articles. There were, of course, also bundles of kakapo tail feathers in S131/4 and numerous kaka tail feathers, from which the red-coloured tips had been sliced, in S131/6.

Very probably, both preserved bird carcasses and brightly coloured feathers, items of relatively high value in the Maori world, were sought more or less equally.

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