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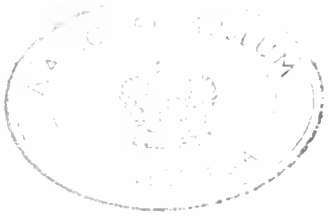

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THE SCRUB-TIT Acanthornis magnus – STATUS & ECOLOGY

D. G. Thomas

THE Scrub-Tit Acanthornis magnus is one of the least known of the Tasmanian endemic birds. Apart from a paper by Sharland (1954) little has been written about this species, yet several writers recently have made conflicting and erroneous statements about its distribution, status and ecology (Keast 1970, Abbott 1972, MacDonald 1973). Significantly these writers have spent only limited time in Tasmania and have little first-hand knowledge of the bird. The present paper presents new data on distribution, habitat preference, status and foraging ecology. For the sake of completeness, some notes on voice and breeding, based largely on Sharland (1954), are included.

DISTRIBUTION, HABITAT PREFERENCE AND STATUS

BASED on personal observations and others kindly supplied by members of the Bird Observers' Association of Tasmania and others, notably L. E. Wall and B. C. Mollison, augmented by records taken from the literature, it is apparent immediately that the Scrub-Tit is confined virtually to areas having a yearly rainfall greater than 40 inches. The 40 inch isohyet approximately separates cold wet adapted habitats (wet sclerophyll, temperate rain forest, high moors, dwarf mountain shrubbery and wet sedgeland including buttongrass plains) from warm dry adapted habitats (dry sclerophyll, savannah woodland and coastal heath plus cultivated areas), a habitat classification based largely on that of Ridpath and Moreau (1966). Generalised rainfall and habitat maps cannot include small areas where the effective rainfall may be higher than in adjacent areas and in which small pockets of a different kind of habitat exist. Moist shaded areas in the drier eastern part of the State may carry atypical vegetation. Wet gullies, for example, occur throughout dry sclerophyll even at sea level (Jackson 1965). The existence of cold wet adapted habitats in areas having a lower yearly rainfall than 40 inches accounts for most of the records that lie on the lower side of the 40 inch isohyet. For example, wet forest occurs on the eastern side of Mount Dromedary where I have recorded the Scrub-Tit.

Sharland (1954, 1958) quotes few actual localities, the eastern faces of Mount Wellington, Russell Falls, Lake St. Clair and the Franklin River, but he implies that it is common in other areas where dense moist forests exist. This is

confirmed by other observations.

It is interesting that the Scrub-Tit occurs in areas of temperate rain forest in the eastern part of the State that are isolated from the main block of this habitat in the western half of the State. Thus, the Scrub-Tit occurs on the Ben Lomond massif, Mount Elephant, Eaglehawk Neck, the Tasman Peninsular and Mount Mangana on Bruny Island. There is also a small population on King Island (Green and McGarvie 1971) and it may occur on Flinders Island (Green 1969) where it was recorded by Le Soeuf (1902).

Sharland (1954) stresses the dependence on ferns, particularly the tree-fern Dicksonia antarctica, a statement repeated by McGill (1970) in his monograph on the Australian warblers. However, Sharland (1958) extends the range of the Scrub-Tit to include dense scrubs, fern gullies, beech forests and, in summer, low shrubs on highland moors. Ridpath and Moreau (1966) state that the Scrub-Tit is common in temperate rain forest and dwarf mountain shrubberies and has been recorded from wet sclerophyll and sub-alpine forests. I have found the Scrub-Tit is common in temperate rain forest, fern gullies, wet sclerophyll and sub-alpine forests and to occur in thick scrub on moorland. I do not agree with Sharland that it is dependent on ferns. It is common in wet sclerophyll (e.g. between Russell and Lady Barron Falls), temperate rain forest (e.g. along the H.E.C. Nature Trail on the Scotts Peak Road) and sub-alpine forest (e.g. Lake Dobson) where there are few, if any, ferns.

Although Sharland (1958) states that the Scrub-Tit is common in a restricted number of habitats, all adapted to cold wet conditions, Keast (1970), after two short visits to Tasmania, writes "The writer was able to gather little data on the frequency of the habit [trunk feeding and bark probing] in Sericornis [=Acanthornis] magnus because of its rarity." There can be no doubt that the Scrub-Tit is far from being rare in fern gullies, wet sclerophyll, temperate rain forest and sub-alpine forest, habitats that are restricted to areas that receive more than 40 inches of rain a year. This restricted distribution has led Ridpath and Moreau (1966) to suggest that the Scrub-Tit was present in Tasmania at the height of the last glaciation some 18,000 years B.P.

As pointed out by Sharland (1954), the Scrub-Tit invariably occurs in habitats shared by two other members of the Maluridae, the Tasmanian Thornbill Acanthiza ewingi and the Brown Scrub-Wren Sericornis humilis, both of which are common in habitats occupied by the Scrub-Tit. On 1 April, 1974, I measured the foraging methods of all species at Russell Falls. The method used (see below) was the same for all species, so a comparison of the number of observations for each should give a crude idea of their relative abundance, which was :

Tasmanian Thornbill	33
Scrub-Tit	29
Brown Scrub-Wren	29

These figures confirm that the Scrub-Tit is a common bird in this locality and further observations in the Arve Valley, Mount Field National Park and along the Gordon and Scotts Peak roads suggest that the results at Russell Falls are typical for the habitats concerned (wet sclerophyll, temperate rain forest and sub-alpine forest).

The Scrub-Tit is easily overlooked by the casual observer, which accounts for the apparent scarcity of published records. The reason for this are discussed fully by Sharland (1954).

VOICE

THE Scrub-Tit has a range of calls although, when foraging undisturbed, it is largely silent. I have been able to distinguish two calls to which I can ascribe a specific purpose. These are:

1. an alarm call, described as "to-wee-to" by Sharland (1958) but which also may consist of four notes "to-wee-to-wee" or "to-wee-to-to", and

2. a contact call, a soft "peep".

The contact call is very similar to those of the Brown Scrub-Wren and Tasmanian Thornbill. Although Sharland (1954) regards this as "a rather striking example of parallel vocal development" I suspect that vocal mimicry is involved. It is difficult to explain what purpose is served by vocal mimicry in the Scrub-Tit or, even if parallel vocal development is involved, why it should have developed such a wide repetoire of calls. Helpers at the nest occur in the Yellow-rumped Thornbill Acanthiza chrysorrohoa (Harrison 1969) and Brown Thornbill (data in R. A. O. U. Nest Record Scheme and pers. obs.) and probably, therefore, in other Acanthiza spp. including Tasmanian Thornbill. Harris and Newman (1974) have shown recently that helpers at the nest occur in the Brown Scrub-Wren. Both the Tasmanian Thornbill and Brown Scrub-Wren occur commonly in small groups and in such species, particularly where they inhabit dense vegetation, a wide range of calls is to be expected. There is no suggestion in the literature that the Scrub-Tit is other than monogamous, is mainly sedentary and does not have helpers at the nest. McGill (1970), for instance, states that it "is either seen singly or in pairs." However, I have April records of groups of four birds in both temperate rain forest and sub-alpine forest. I have also an April record of it occurring with Tasmanian Thornbills and Brown Scrub-Wrens in a mixed foraging flock in sub-alpine forest.

BREEDING

AS far as is known the Scrub-Tit has a simple pair-bond and has not evolved helpers at the nest. In view of its wide range of calls, regardless of whether vocal mimicry is involved, and my observation above, this aspect needs investigating thoroughly.

The display and nest have been described by Sharland (1954). A common nest-site is in the dead fronds of tree-ferns but low scrub is used also. The breeding season is said to be September to January (McGill 1970) and the clutch consists of three to four eggs (Sharland 1958). Eggs are mostly white, blotched red and brown and measure 18 x 14 mm (McGill 1970).

Little else is known about the breeding of the Scrub-Tit.

FEEDING ECOLOGY

KEAST (1970) believes that the Scrub-Tit is steadily being compressed by the Brown Scrub-Wren. This must imply that the Brown Scrub-Wren is replacing the Scrub-Tit because of competitive exclusion. The affinities of the Scrub-Tit are not fully

understood. The name Acanthornis was devised by Legge (1888) who considered it was related to both the thornbills Acanthiza and scrub-wrens Sericornis; Acanthornis is a combination of both names. Some authorities, e.g. Keast (1970), regard the Scrub-Tit as belonging to the genus Sericornis. I prefer to follow Ridpath and Moreau (1966) and the C.S.I.R.O. Checklist (CSIRO 1969) in retaining the Scrub-Tit in the monotypic genus Acanthornis, at least until further evidence as to its affinities is available. Both Keast (1970) and Abbott (1972) consider possible competition between species in Tasmania but restrict their arguments almost entirely to species within the same genus. I believe that this is a very narrow view and that, when considering possible competition, all species having similar morphology or feeding habits should be considered. In the present case this means including the three members of the Maluridae that are common in the cold wet habitats of Tasmania.

Abbott (1972) considers that the foraging zones of the Scrub-Tit are the same as those of the Brown Scrub-Wren and the White-browed Scrub-Wren Sericornis frontalis of the mainland and that all three species spend over 95% of their foraging time on the ground or within six feet of the ground. No supporting data are given. Galbraith and Parker (1969) have shown, from morphological considerations, that both the Brown and White-browed Scrub-Wrens are largely terrestrial and the inference from Abbott's statement is that the Scrub-Tit also is largely terrestrial, as is stated by MacDonald (1973). However, Sharland (1954) makes it abundantly clear that the Scrub-Tit is arboreal, resembling a tree-creeper in its foraging method, a statement that is repeated by Ridpath and Moreau (1966), Keast (1970), McGill (1970). Sharland (1958) modifies his views by stating "Food, insects gathered from ground and shrubs" although still mentioning its tree-creeper like habits.

Morphology

There is considerable evidence that for two species to co-exist without habitat displacement the ratio of some morphological character, normally bill length, for the two species must exceed 1.3 (Hutchinson 1959), MacArthur and Wilson 1967). The measurements, taken from Abbott (1972), of mean bill, tarsus, hallux and wing lengths for the three species concerned are :

	MEAN LENGTH mm				
	Bill	Tarsus	Hallux	Wing	N
Tasmanian Thornbill (♂)	11.8	21.4	7.8	54.6	37
Scrub-Tit (unsexed)	15.3	21.4	9.7	55.9	18
Brown Scrub-Wren (♂)	16.7	24.7	10.5	63.1	43

The only ratios which exceed 1.3 are those for bill length (1.41) and hallux length (1.35) for the Brown Scrub-Wren/Tasmanian Thornbill species pair. The ratio for bill length (1.297) for the Scrub-Tit/Tasmanian Thornbill species pair just fails to reach 1.3. (However, if the Scrub-Tit sample contains females and these are smaller than males, the bill length ratio may be smaller). In other words, for the three species to co-exist as they do they must occupy different parts of the habitat or have different diets.

Food

The three species are insectivorous (Sharland 1958, Cayley 1959, Ridpath and Moreau 1966, McGill 1970). Because birds are largely opportunistic feeders eating each suitable item as it is encountered (MacArthur and Wilson 1967, Cody 1968, Thomas and Dartnall 1971) dietary differences as such can be ruled out as a means of avoiding competition.

Little has been published on the diets of the species concerned. Green and McGarvie (1971) list the stomach contents of four Brown Scrub-Wrens from King Island. B.C. Mollison (unpublished) determined the stomach contents of one Scrub-Tit and four Brown Scrub-Wrens, all collected in the Florentine Valley :

Scrub-Tit; entirely insect remains – legs of spiders, beatles, etc.
Brown Scrub-Wren; craneflies, spiders, beatles, weevils, small seeds (3 out of 4 stomachs) and other plant remains (2 stomachs); small quartz particles (2 stomachs).

Both Green and McGarvie (1971) and Mollison found seeds in the stomachs of six out of eight Brown Scrub-Wrens. It is not known whether seeds are selected items of food or are mistaken for small insects.

Foraging Height

The following table summarises the foraging height distributions for the three species :

FORAGING HEIGHT Feet	PERCENTAGE OF OBSERVATIONS		
	Tasmanian Thornbill	Scrub-Tit	Brown Scrub-Wren
0	0.8	0	43.8
1-5	12.0	49.6	55.2
6-10	11.2	19.8	1.0
11-15	15.0)	17.1	0
16-20	30.1)		
21-30	21.1	9.0	0
30	9.8	4.5	0
Mean Height Ft.	19.5	10.1	1.2
No. of observations	133	111	96

The previous table shows clearly that the three species show a degree of habitat zonation vertically. It confirms the views of Galbraith and Parker (1969) and Abbott (1972) that the Brown Scrub-Wren rarely forages above six feet from the ground. It shows also that Sharland (1954) is correct in stating that the Scrub-Tit is arboreal and that both Abbott (1972) and MacDonald (1973) are wrong in claiming that it is largely or wholly terrestrial.

Observations are included from fern gullies, wet sclerophyll, temperate rain forest and sub-alpine forest. As yet, insufficient data have been accumulated to determine whether foraging heights differ in the various habitats.

Foraging Zones

Foraging zones were determined at the same time as foraging heights on several occasions with a total observation time of 27 hours. The zone occupied by a bird foraging actively was noted. If the bird moved and continued foraging a further note was made, whether or not the bird moved to another foraging zone. To avoid undue bias observations of a particular individual were restricted to five. Again, observations were made in fern gullies, wet sclerophyll, temperate rain forest and sub-alpine forest.

FORAGING ZONE	PERCENTAGE OF OBSERVATIONS		
	Tasmanian Thornbill	Scrub-Tit	Brown Scrub Wren
Ground	< 1	0	32
Debris	0	3	47
Herb/low fern layer	< 1	0	5
Trunks - trees	5	45	< 1
" - ferns	0	9	< 1
Branches	14	23	3
Fern fronds	2	13	2
Twigs	15	6	8
Foliage	62	< 1	< 1
Aerial hawking	< 1	0	0
No of observations	129	115	102

There are very clearly defined differences in foraging zones. The Brown Scrub-Wren forages largely on the ground or among the debris (fallen trees, etc.) lying on the ground (79%). The Scrub-Tit forages mainly on tree trunks and branches and fern trunks and fronds (90%) and the Tasmanian Thornbill forages mainly among the leaves and twigs (77%). Because the three species forage at different heights and in different foraging zones they do not compete directly for the available resources

In addition to the trunks of tree-ferns, the Scrub-Tit has been seen foraging on the trunks of Sassafras Atherosperma moschata, Musk Olearia argophylla, Antarctic Beech Nothofagus cunninghami, Snow Gum Eucalyptus coccifera,

the smooth trunks of E. urnigera and Horizontal Scrub Anodopetalum biglandosum

CONCLUSION

THE Scrub-Tit is common in a restricted range of habitats – fern gullies, wet sclerophyll, temperate rain forest and sub-alpine forest, which occur mainly in areas where rainfall exceeds 40 inches a year. It co-exists with two other small members of the Maluridae, the Tasmanian Thornbill and the Brown Scrub-Wren. Direct competition between these species is minimised by each foraging at a different height and/or in a different foraging zone. The Scrub-Tit is arboreal, obtaining most of its food from the trunks of trees and ferns and from branches and fern fronds. The Brown Scrub-Wren is mainly terrestrial and the Tasmanian Thornbill obtains most of its food from the outermost twigs and the foliage. There is no evidence, therefore, to support Keast's assertion that the Scrub-Tit is being compressed by the Brown Scrub-Wren. On the contrary, the evidence given in this paper shows clearly how the three members of the Maluridae can co-exist in the same habitats. If the Scrub-Tit was being replaced it would be expected to become extinct first in the small isolated areas of cold wet adapted habitats in eastern Tasmania. This is not the case.

It has been shown that recent statements by Keast (1970), Abbott (1972) and MacDonald (1973) concerning the Scrub-Tit are erroneous. This is a matter of some concern on two grounds. Firstly, while my methods differ widely from Sharland's, my results confirm his general statements (Sharland 1954, 1958) which these authors, whose personal knowledge of the Scrub-Tit can only be slight, have chosen to ignore entirely or in part. Secondly, the question must be raised as to how much credance can be put on other statements by these authors where these are not supported by sound data. Certainly, other erroneous or ambiguous statements, in one case supported by totally inadequate mathematical data, can be found in the works referred to. This is undesirable because the views of other workers may be distorted seriously.

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BIRDS OF HUNTER AND ITS OFF-SHORE ISLANDS

D. Pinner and L. Bird

INTRODUCTION

HUNTER ISLAND lies in the western approaches to Bass Strait, approximately three miles off the north-western tip of Tasmania and some 15 miles from Smithton. Hunter is the largest island in the Hunter Group, being some 14 miles long and with a maximum width of four miles. Its area is 21,000 acres. The highest point is a small conical hill of 250 - 300 feet in the centre of the northern half of the island.

Regarding the vegetation, the island is split roughly in two. The southern half consists mainly of undulating pastoral land. The island is leased to a Mawbanna pastoralist, Mr. P. Maguire, who runs some 700 head of cattle on it. There is a homestead and some outbuildings which are occupied for a few days each month. Scattered on the hills are stands of Banksia marginata and in the gullies thickets of Melaleuca and Leptospermum spp. Most gullies contain patches of rushy swamps which support many small mammals such as wallaby. There are three large lagoons, one in the southern part of the island which supports numerous waterfowl. Many other small water holes are attractive to wildlife. Black Currawongs Strepera fuliginosa and Forest Ravens Corvus tasmanicus nest in the trees surrounding these water holes.

Hunter Island has an equitable maritime climate with few frosts and an average rainfall of about 30 inches which is distributed throughout the year. The prevailing wind is westerly and many of the Banksias on the hills have an easterly lean. There are some fine beaches on the eastern side and rugged stretches of coast on the western side. The northern half of the island and a strip down the eastern side of the southern half are covered with thick scrub, heath and moorland. Part of the western side of the northern half is a large swamp containing two large lagoons. The larger of the two lagoons is surrounded by thick scrub and an attempt to reach it on horseback proved unsuccessful.

Over the past ten years we have made regular visits to Hunter Island. We have landed also on Black Pyramid and Albatross Rock where we have banded

Australian Gannets Morus serrator, Diving Petrels Pelecanoides urinatrix, Fairy Prions Pachyptila turtur and White-capped Albatross' Diomedia cauta.

As far as we are aware little has been published on the birds of these islands. We do not claim that the following lists are exhaustive but believe that they will form a basis for future study.

ANNOTATED LIST OF SPECIES

LITTLE PENGUIN Eudyptila minor Common, more so on the southern end and the eastern beaches.

WHITE-CAPPED ALBATROSS Diomedia cauta Because of the nearness of Albatross Rock these birds are a common sight off-shore.

SHORT-TAILED SHEARWATER Puffinus tenuirostris Many thousands breed on Hunter Island. Two large colonies were found, one at each end of the island. Both are commercially exploited each season.

WHITE-FACED STORM PETREL Pelagodroma marina Although we did not see any we were told by the late Mr. G. French that they breed on the northern tip.

AUSTRALIAN PELICAN Pelecanus conspicillatus A small colony breeds on Penguin Island between Hunter and Walker Islands. This colony has existed for at least 80 years (Le Souef 1920).

AUSTRALIAN GANNET Morus serrator Breeds on Black Pyramid. Common off-shore.

BLACK-FACED CORMORANT Phalacrocorax fuscescens A small breeding colony was found on a rocky outcrop just above high water mark on the western side of the island.

HOARY-HEADED GREBE Podiceps poliocephalus Several pairs were seen on the large lagoon in the southern part of the island which appears suitable for breeding but this could not be proved.

BLACK SWAN Cygnus atratus Several pairs with nests and young have been seen on the large lagoon in the southern part of the island.

BLACK DUCK Anas superciliosa Large numbers seen at most of the lagoons and water holes.

CHESTNUT TEAL Anas castanea As for the previous species. A nest with c/11 was found in a tussock.

MUSK DUCK Biziura lobata One pair seen on the last two visits on the large lagoon in the southern part of the island.

WEDGE-TAILED EAGLE Aquila audax An occasional bird seen in the past two years.

WHITE-BREASTED SEA EAGLE Haliaeetus leucogaster At least three pairs nest on the island, two on the eastern and one on the western side.

SPOTTED HARRIER Circus assimilis A bird fitting the description of this species was seen by three members of the party in November 1973.

SWAMP HARRIER Circus approximans Fairly common over most of the island. One was seen disputing ownership of some prey with a pair of Peregrine Falcons.

PEREGRINE FALCON Falco peregrinus One pair has been seen on numerous occasions. They appear to work the southern half of the island and to have a favourite perch on top of a tall rock column on the eastern coast.

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NANKEEN KESTREL Falco cenchroides One seen on the eastern side of the island by two members in November 1973. R.H. Green saw one a week later.
BROWN QUAIL Synoicus ypsilophorus Fairly common in parties up to eight, particularly in heathy areas.
LEWIN WATER RAIL Rallus pectoralis One collected by R.H. Green in November, 1973.
SPOTLESS CRAKE Porzana tabuensis One collected by R.H. Green in November, 1973.
SWAMPHEN Porphyrio melanotos Common round the edges of marshes and flats. One nest in a ti-tree clump was 12 feet from the ground.
PIED OYSTERCATCHER Haematopus ostralegus Very few seen and only on the eastern side.
SOOTY OYSTERCATCHER Haematopus fuliginosus Common all round the coast.
SPUR-WINGED PLOVER Vanellus miles Several pairs have been found breeding in the semi-pastoral areas.
BANDED PLOVER Vanellus tricolor Occasional pairs have been seen flying over the island.
HOODED DOTTEREL Charadrius cucullatus Fairly common. Found on the beaches on both sides of the island.
RED-CAPPED DOTTEREL Charadrius alexandrinus Although not plentiful they are to be found on the eastern beaches. One pair nested in the middle of the airstrip.
JAPANESE SNIPE Gallinago hardwickii Flushed from the marsh flats on every visit.
SILVER GULL Larus novaehollandiae A small nesting colony was found close to the cormorants on the western side of the island.
PACIFIC GULL Larus pacificus Several nests found and mature and immature birds seen feeding on the beaches.
COMMON BRONZEWING Phaps chalcoptera Numbers seen at the northern end of the island where there are considerable areas of light Eucalyptus forest. The dominant species is E. simmondsii.
YELLOW-TAILED BLACK COCKATOO Calyptorhynchus funereus In 1972 seven were seen feeding on Banksias. One pair has nested for at least ten years in a hole 50 feet from the ground in a dead Eucalypt.
GREEN ROSELLA Platycercus caledonicus Common in most parts of the island but more so on the eastern side where they appear to favour rock-strewn gullies.
GROUND PARROT Pezoporous wallicus A pair flushed in heathy moorland in the northern half of the island.
PALLID CUCKOO Cuculus pallidus Fairly common.
FANTAILED CUCKOO Cacomantis pyrrhophanus Fairly common.
GOLDEN BRONZE CUCKOO Chalcites plagosus Fairly common.
BOOBOOK OWL Ninox novaeseelandiae Heard calling from a thick clump of Melaleuca on most visits.
SKYLARK Alauda arvensis Common.
WELCOME SWALLOW Hirundo neoxena Several pairs nest in some of the old dwellings and small caves.
AUSTRALIAN PIPIT Anthus novaeseelandiae Common in the more open parts and semi-pastoral areas.
BLACK-FACED CUCKOO-SHRIKE Coracina novaehollandiae Has been seen in lightly timbered areas at the northern end of the island.

BLACKBIRD Turdus merula Fairly common.
SUPERB BLUE WREN Malurus cyaneus Occasional small groups have been seen on the edges of clearings.
BROWN THORNBILL Acanthiza pusilla Although not numerous, a few have been seen in the vegetation on the edges of waterholes.
BROWN SCRUB-WREN Sericornis humilis Seen and heard in the thick undergrowth along some of the creeks.
WHITE-FRONTED CHAT Epthianura albifrons Numerous pairs with young have been seen among the tussocks in the semi-pastoral areas.
SCARLET ROBIN Petroica multicolor Common in some of the more heavily wooded areas and along some of the creeks.
FLAME ROBIN Petroica phoenicea As for the previous species.
GREY FANTAIL Rhipidura fuliginosa Numbers seen hawking insects on all visits.
GOLDEN WHISTLER Pachycephala pectoralis Fairly common. Often heard calling in the thicker vegetation and wet areas.
OLIVE WHISTLER Pachycephala olivacea One heard calling in a heavily timbered gully on the eastern side of the island for the first time in 1972. Several were heard in 1973.
GREY SHRIKE-THRUSH Colluricincla harmonica Although not numerous, several have been seen in different parts of the island.
SPOTTED PARDALOTE Pardalotus punctatus Fairly common in most parts of the island.
YELLOW-TIPPED PARDALOTE Pardalotus striatus As for previous species.
GREY-BREASTED SILVEREYE Zosterops lateralis Although not common, a few seen foraging in the foliage in different parts of the island.
BLACK-HEADED HONEYEATER Melithreptus affinis One bird seen by several observers in 1973. The first record for the island.
STRONG-BILLED HONEYEATER Melithreptus validirostris Two immature birds at northern end and several adult birds in the centre of the island are our first records for the island.
CRESCENT HONEYEATER Phylidonyris pyrrhoptera Fairly common, particularly in thicker vegetation.
TAWNY-CROWNED HONEYEATER Gliciphila melanops The commonest honeyeater on the island. It is found in similar habitats to those it occupies on the Tasmanian mainland. Several nests with eggs or young have been found. Nest sites range from ground level to three feet above it.
EASTERN SPINEBILL Acanthorhynchus tenuirostris A few have been seen and heard but it is by no means common.
BEAUTIFUL FIRETAIL Emblema bella Fairly common during earlier visits but on later visits only occasional pairs have been seen.
HOUSE SPARROW Passer domesticus Uncommon.
GOLDFINCH Carduelis carduelis Common.
GREENFINCH Chloris chloris Uncommon.
STARLING Sturnus vulgaris Common.
DUSKY WOOD-SWALLOW Artamus cyanopterus Numbers seen flying across the island and hawking insects on most visits.

BLACK CURRAWONG Strepera fuliginosa This species, along with the Forest Raven, is the commonest passerine on the island. They are found in most parts of the island and, with flocks of ravens, feed on Bull Kelp on the western side. They are very regular in their nesting times as most nests inspected on each visit contained eggs but no young. Some nests are as low as eight feet from the ground.

WHITE-BACKED MAGPIE Gymnorhina hypoleuca One bird was seen several years ago but we have not seen any since although we have been told by Mr. P. Maguire that there is a pair near the house.

FOREST RAVEN Corvus tasmanicus Very common. Breeds in most parts of the island. Because most trees are less than 40 feet high the birds nest low down, some nests being only ten feet above the ground. All nests contained young and the breeding season appears to vary little from year to year.

BIRDS OF SOME OF THE SMALLER ISLANDS

On 7 December, 1968 a small party visited two of the smaller off-shore islands, Bird and Penguin Islands. Bird Island lies about two miles south of Hunter and Penguin Island lies midway between Hunter and Walker Islands.

Birds seen on Bird Island were : Black-faced Cuckoo-Shrike, Chestnut Teal, Brown Quail, Sooty Oystercatcher, Silver Gull, Pacific Gull, White-fronted Chat, Golden Whistler, Yellow-winged Honeyeater Phylidonyris novaehollandiae, Starling Black Currawong and Forest Raven. Most species had either eggs or young. One Chestnut Teal nest had c/10 and four nests of the Brown Quail were found.

Birds seen on Penguin Island were : Little Penguin, Fairy Prion (six pairs each with c/1), Short-tailed Shearwater, White-faced Storm Petrel, Australian Pelican (8 pairs), Black-faced Cormorant, Sooty Oystercatcher, Silver Gull, Pacific Gull and Caspian Tern Hydroprogne caspia (with young).

DISCUSSION

Birds of 71 species, including introduced species, were identified on Hunter Island and an additional three species on the off-shore islands. Six are endemic to Tasmania. There was one species of thornbill which we could not identify and did not fit the description of either the Brown or Tasmanian Thornbill Acanthize ewingi. There were some doubtful species of ducks which are not included.

On 21 November, 1966, on Hunter Island, we saw a large number of Black Currawongs and Forest Ravens gathered round the nesting burrows of Short-tailed Shearwaters. They were there for the full time of our stay (three days). Upon further investigation it appeared that the birds were enjoying an easily obtained meal in the form of eggs. Apparently, in the confusion of the start of laying, a number of eggs were dropped outside the burrows and, consequently, eggs were readily available to opportunistic foragers such as Black Currawongs and Forest Ravens.

REFERENCE

LE SOUEF, A.S. 1920. Pelicans. Emu. 19 : 237

BIRDS OF THE AUSTRALIAN NEWSPRINT MILLS CONCESSION – FLORENTINE AND STYX VALLEYS (continued)

B.C. Mollison

BLACK-FACED CUCKOO-SHRIKE Coracina novaehollandiae Prefers part-cleared areas such as Junee and the buttongrass fringesof Tim Shea. Occasionally overwinters.
GROUND THRUSH Zoothera dauma Common in rainforest. A common food is the large native snail Caryodes dufresni.
BLACKBIRD Turdus merula Common in the Maydena area. Has penetrated to the Rasselas Valley and gullies on Tim Shea. Most numerous in areas of blackberries.
SUPERB BLUE WREN Malurus cyaneus Common on forest fringes, roadsides and cutovers throughout the area. Occurs in family groups of up to seven birds.
TASMANIAN THORNBILL Acanthiza ewingi Common. Pairs and small groups occur throughout bracken areas and cutovers, and in wattle fringes. The Brown Thornbill may be present (it occurs at Kallista – Ed.)
SCRUB TIT Acanthornis magnus Common in the same areas as the previous species.
BROWN SCRUB WREN Sericornis humilis As for previous two species.
FIELD WREN Calamanthus fuliginosus Recorded in Bauera rubioides and buttongrass on the slopes of Tim Shea.
SCARLET ROBIN Petroica multicolor Occasionally seen at Maydena.
FLAME ROBIN Petroica phoenicea Very common in open situations and on cutover areas, forming quite large (30 or more) flocks, scattered over an area and often predominantly of one sex.
PINK ROBIN Petroica rodinogaster Pairs, common in deep fern gullies and rain forest, rarely venturing far from the tree line.
DUSKY ROBIN Petroica vittata Favours burnt coupe sites, most of which have a small population of Dusky Robins.
GREY FANTAIL Rhipidura fuliginosa Individuals and pairs are common in open situations. It also occurs in tall eucalypt forests.
GOLDEN WHISTLER Pachycephala pectoralis Common on forest fringes and at Junee.
OLIVE WHISTLER Pachycephala olivacea Common in densely forested areas and fringes. Frequents the ground and understorey.
GREY SHRIKE-THRUSH Colluricincla harmonica Common throughout the area.
SPOTTED PARDALOTE Pardalotus punctatus Present all year throughout the eucalypt forests.
YELLOW-TIPPED PARDALOTE Pardalotus striatus Common on coupes in the Florentine Valley in summer.
GREY-BREASTED SILVEREYE Zosterops lateralis Variable in numbers, occurring in flocks of hundreds at times. They hunt insects in wattles and also frequent rain forest and scrub areas, feeding on insects and small berries such as the Native Currant Coprosma billardieri.
YELLOW-THROATED HONEYEATER Meliphaga flavicollis Widespread in all but rainforest. Insectivorous, they probe knot-holes and bark and visit foliage.
STRONG-BILLED HONEYEATER Melithreptus validirostris. Travelling in flocks of

up to 70 birds, is plentiful in all sapling eucalypt stands and in mature forest. Groups visit all eucalypts on their territory, particularly those with rolls of bark hanging from the trunks (E. regnans, E. obliqua). Flocks break up somewhat for breeding (December - January) but reform in February.

CRESCENT HONEYEATER Phylidonyris pyrrhoptera The common honeyeater of the open areas such as Tim Shea and Kallista.

NEW HOLLAND HONEYEATER Phylidonyris novaehollandiae Present in tea tree and sedgeland at Kallista and Tim Shea but far less common than the previous species.

YELLOW WATTLEBIRD Anthochaera paradoxa Not numerous. Occurs in the Kallista area and in National Park. A party of six was seen at the Settlement (November).

BEAUTIFUL FIRETAIL Emblema bella Occasionally seen at Maydena and Junce.

HOUSE SPARROW Passer domesticus Plentiful at Maydena.

GOLDFINCH Carduelis carduelis Penetrates all logging roads, small flocks can be seen through the forested areas and around Maydena from March to September when they return to the lower Derwent Valley to breed. Flocks rarely exceed 20.

STARLING Sturnus vulgaris Winter flocks of 400 occur at Maydena and strays are seen over sedgeland. A few are resident at the Settlement.

DUSKY WOOD-SWALLOW Artamus cyanopterus Plentiful at Karanja in summer. My only other record was of one bird at John Bull (November).

BLACK CURRAWONG Strepera fuliginosa Common throughout the area.

CLINKING CURRAWONG Strepera arguta My records all refer to small numbers (2 to 5) around the depot at Maydena, at Kallista and on the Junee Valley road.

GREY BUTCHERBIRD Cracticus torquatus I have only two records from near Maydena (Kallista in April and Junee in July).

FOREST RAVEN Corvus tasmanicus Common throughout the area. Flocks gather on pasture near Maydena in winter (maximum 45).

Logging roads and cutover and burnt areas will present an increasingly variable habitat for birds, and it may be expected that bird numbers will increase rather than decrease as logging operations expand. However, the destruction of certain habitat types may affect adversely certain species. This list may prove useful for later comparison.

REFERENCE

Gilbert J. M. 1965. "Forestry", in Atlas of Tasmania : 66 - 67. Ed. J. L. Davies, Hobart : Lands & Surveys Department.

RELATIONS BETWEEN STRANGE BROWN HAWKS

N. Brothers

USUALLY when a strange bird is released in a new area its presence is resented by the normal territory-holders of that species and open attacks may take place. I have to report an apparent incident of quite contrary behaviour in Brown Hawks Falco berigora.

On 29th October, 1973 a landholder at Kingston caught a Brown Hawk and a Brown Goshawk Accipiter fasciatus, in a crow trap. He communicated with the National Parks and Wildlife Service, suggesting that these birds be released elsewhere as, though they had been attacking his poultry, he did not wish to kill them.

I was deputed to release them at Moulting Lagoon, 120 miles distant, which I did two days later. The Goshawk, when set free, quickly disappeared into the bush. The Brown Hawk settled on a nearby dead Acacia in a grove of live trees. Though it appeared to me to be well hidden, within five minutes it was joined by another Brown Hawk, which flew directly to it, screaching loudly as it approached. It sat on the same branch as the bird from Kingston and very close to it. It "chattered" to the newcomer and made apparently caressive movements with its beak at the head of the other bird, which remained silent and motionless. After 2-3 minutes the local bird flew off but returned 10-15 minutes later and rejoined the new bird. They then both flew off together. Brown Hawks are plentiful in the Moulting Lagoon area.

A KERGUELEN PETREL AT MT. FIELD NATIONAL PARK

L. E. Wall

ON 22 July 1974 a "muttonbird" was reported having been found injured near the ranger's house at M Field National Park. It died soon afterwards and was sent to National Parks Headquarters in Hobart. It should be recorded that a heavy south-westerly storm had raged for the two days before this bird was found.
The general description is :- dark grey above; grey below (including underwings); marginal coverts of the ulnar region whitish; bill black, deep and laterally compressed; legs and feet grey, webs dark grey. Measurements – length, 380 mm; culmen, 27 mm; tarsus, 41 mm; mtc. 51mm; wing, 248 mm; tail, 115 mm.

In Canberra during August I was able to examine two specimens at the C.S.I.R.O. Division of Wildlife Research and to discuss this bird with Dr. P. Fullagar and with Mr. F.C. Kinsky of the Dominion Museum, Wellington N.Z. The latter made the comment which I have not seen quoted in the literature that this species has a very high forehead which is a useful feature for identification. A subsequent check of the specimen in Hobart showed this quite clearly. In the "Handbook of Australian Seabirds" by Serventy, Serventy and Warham, the other diagnostic feature, which is most noticeable in this Tasmanian specimen, is the pronounced white ulnar margin to the wings.

This is the third Tasmanian record of the species.

A ROYAL PENGUIN AT SAFETY COVE

NATIONAL Parks and Wildlife Service reported that a Senior Ranger, Mr. Rex Gatenby, had found this bird on Safety Cove beach on 19 March 1974. It was just beginning to moult. The following description and measurements were supplied, – approx. body length, 660 mm; approx. bill length, 80 mm; back and head, blue-black; throat, white; crest, yellow-orange; bill, reddish-brown; upper surface of feet, flesh pink; under surface of feet, black. The crest was continuous from both sides of the head over the bill.

This description fits the species well except that the bill length is too great. Mr. Gatenby was questioned on the method of measurement and he indicated that his measurement was the gape rather than the exposed culmen. A check of specimens in the Tasmanian Museum showed that his gape measurement was consistent with them, and it can reasonably be accepted that the identification was correct.

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AN OBSERVATION OF ALBINISM IN THE YELLOW-TAILED BLACK COCKATOO

Murray D. Bruce & Ronald 1 Orenstein

ON 13 February 1974, the authors observed a flock of about twenty Yellow-tailed Black Cockatoos Calyptorhynchus funereus opposite the highest point (650.7 m.) on the Gordon River Road to Lake Pedder, Tasmania. Their movements were followed by telescope as they foraged in treetops on a forest slope approximately 500-600 m. distant. A whiteish bird in their midst, at first taken for a White Goshawk Accipiter novaehollandiae, proved on closer examination to be an albinistic Yellow-tailed Black Cockatoo. The bird was a dirty white above, and yellowish white below. The yellow cheek patch and tail band were discernable, though not as intense as in a normally plumaged bird (cf. Forshaw 1969, Australian Parrots p. 52). A hint of dusky on the head outlined the cheek patch, and the tips of the tail feathers were dusky, forming a distinct band.

After about five or ten minutes of observation, Bruce noted a second albinistic cockatoo in the flock. The bird was probably present from the first but it was not until the entire flock came into view that it was realised that there were two abnormally plumaged individuals present. This second bird was similar in appearance to the first, but with the yellow areas on the head and tail more intense.

Both birds appeared to take a normal part in the activities of the flock, both when perched and when engaged in wheeling flights over the trees, and there was no evidence of discriminatory behaviour towards them on the part of the rest of the flock.

Apparently albinism has not previously been recorded in wild black cockatoos (J. Forshaw pers. comm). However, a specimen of C. funereus in the Australian Museum (A.M. no. 09553), collected at Wiseman's Ferry, NSW, on 8 October 1897, exhibits partial xanthochroism. It is largely yellowish, with patches of black and dark brownish on the back, abdomen, primaries and tail.

We are grateful to J.M. Forshaw for his kind assistance in answering questions on albinism in this species. R.B. Payne and R.W. Storer criticised the manuscript of this note.

TASMANIAN AQUATIC NON-MARINE MOLLUSCA
Part 1. Lymnaea

R. C. Kershaw

Introduction

An increase in the number of enquiries concerning the identity of snails which may carry the sheep liver fluke, has emphasized the need for clarification of the nomenclature.

There is only one readily available publication which contains illustrations of these snails (May & Macpherson, 1958, plate 41, figs. 7, 8, 9.). The names used have been redundant for a number of years. As all the non-marine moluscan fauna is in need of review this paper will constitute the first of a series undertaking this on a preliminary basis.

Only one snail species is known as a vector of the liver fluke in Tasmania. This species is the Lymnaea tomentosa (Pfeiffer) 1855.

Discussion

Tenison Woods (1876) believed his four species to be local and distinct from European and Australian forms. Petterd (1888) noted that the European Lymnaea peregra Muller had become acclimatised. Although commenting on the mounting confusion, he believed he had local forms for which new names were required. He thought the localities precluded the possibility of these snails being introduced.

Johnston (1888) summarised Tenison Woods names noting that that author himself believed by 1878 that his species were in fact the L. peregra Muller. There have been many further attempts to clarify the situation. Thus in one of the most useful works on the liver fluke Clunies Ross & McKay (1929) used the name Limnaea brazieri (Smith). Later taxonomists felt that new generic names were warranted and these have persisted since.

Hubendick (1951) in a world study of the Lymnaeidae described the extraordinary variation present in the known species. He suggested that there were few very variable species in Australia. However the Tasmanian situation was not clear enough to enable Kershaw (1954) to revise the Tasmanian names, accepted by May (1921).

Boray & McMichael (1961) recognising the need, reported on laboratory studies which left no doubt that only two groups of these snails existed in Australia. One of these is based on the species Lymnaea lessoni Deshayes which does not occur in Tasmania. The other is based on Lymnaea tomentosa (Pfeiffer) which does occur in Tasmania. This is the species implicated as a vector of the liver fluke. Other species reportedly introduced appear to have died out.

Despite the range of variation exhibited by the species no difficulty should be found in distinguishing it from native Tasmanian snails. Boray and McMichael (l.c.) have listed all the names previously in use so that revision of collections has been facilitated.

Characters of Lymnaea tomentosa

Shells range in size from 5 to 12 mm in length from anterior to apex with occasional larger specimens. The body whorl is inflated and very large compared

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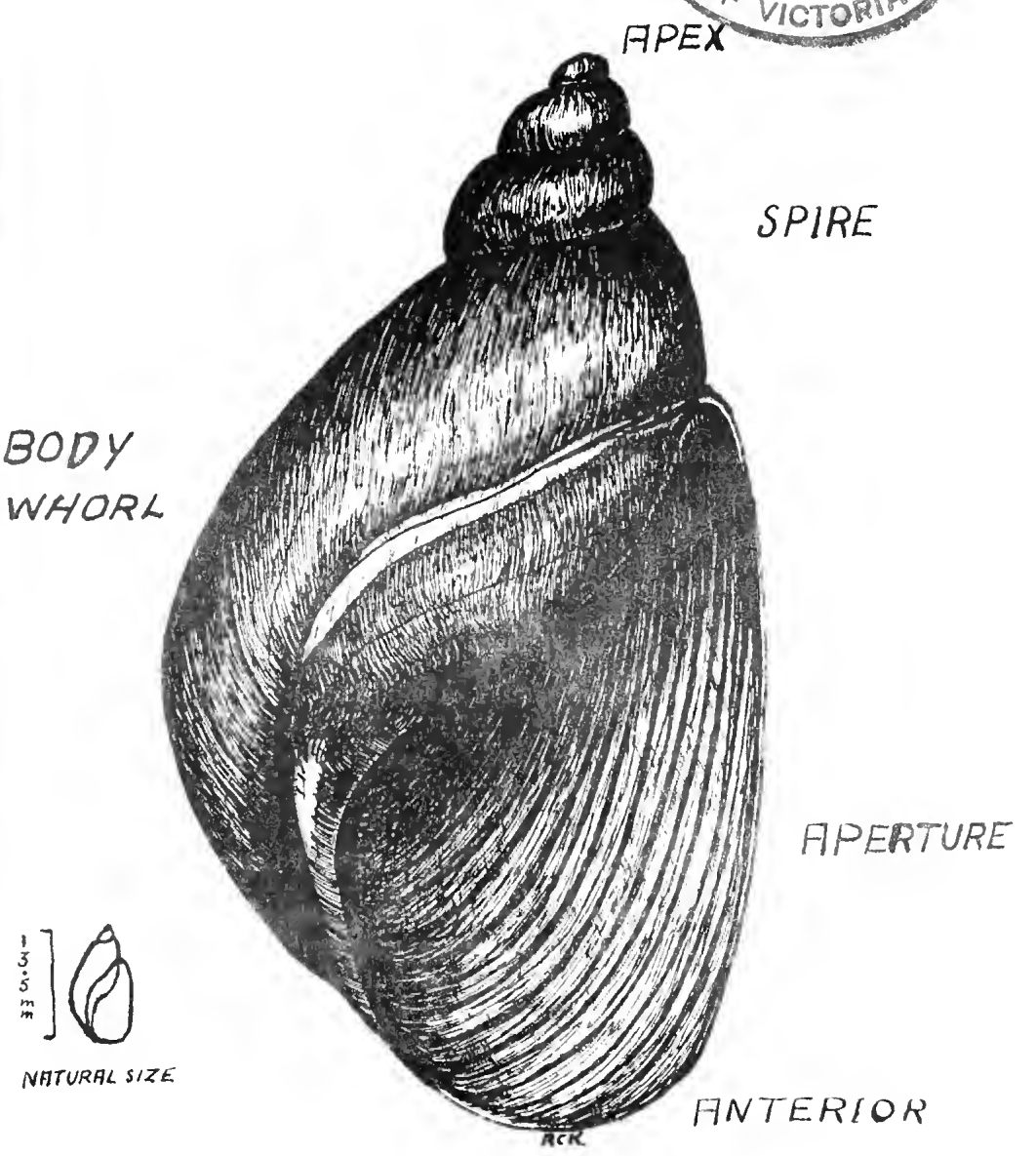

LYMNAEA TOMENTOSA PFEIFFER

to the whorl shell. The spire is comparatively small. The aperture is large and more or less ovate. The observer normally views the shell with the spire uppermost and the aperture facing the observer. In this position it will be noted that the shell is dextral, i.e. the aperture is on the right hand side.

The only comparable shells found in similar situations in Tasmania are sinistral, i.e. the aperture is on the left hand side. These native species will be discussed in a future paper. They have not been implicated as vectors of the liver fluke.

A figure is provided to indicate the features which will assist in identification. The three illustrations in May & Macpherson (l.c.) under the names Austropeplea huonensis, Simlimnea gunnii and Simlimnea neglecta provide some indication of the variation which exists. Each of these illustrations is of Lymnaea tomentosa (Pfeiffer).

Distribution

The Lymnaea tomentosa (Pfeiffer) is to be found throughout much of rural Tasmania. It lives in swamps, lagoons, farm dams, ditches, channels and streams. It is able to aestivate in dry mud for some months even at low temperatures. A population may build up very rapidly. Its rapid and successful establishment in Tasmania in the early days of settlement is clear illustration of the colonizing ability of the species.

Acknowledgement

This work has been materially assisted by the loan of a microscope from the Science and Industry Endowment Fund to whom grateful acknowledgement is made.

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A Note on the Natural History of a Pseudoscorpion

A. J. Dartnall

IN April 1969 two specimens of a pseudoscorpion were collected by the Tasmanian Field Naturalists at Tooms Lake. I identified them as Synsphyronus hanseni (With) and gave some account of its known distribution in Tasmania. We still know very little about our pseudoscorpion fauna though at least 15 species are known to be present, some of which are not yet described.

Synsphyronus hanseni is probably the pseudoscorpion most commonly encountered because it is often found in houses. In 1969 I was able to quote about 8 localities where this species was found. Since that time the locality list has been extended but all that it really demonstrates is that people are more likely to see these animals around Hobart than in the rest of Tasmania - probably because there are more people in the Hobart area to spot them which tells us very little about the distribution of the animal. We do know more about its living habits now. It has been found in houses (often in baths and wash basins), under bark of Eucalyptus globulus and under stones and bricks. It has been recorded from 10 feet above waterlevel at Old Beach and at the summit of Mt. Nelson (1113 feet).

Recently (5.1.1975) Mr. W. Rodgers was collecting fossils at Old Beach and he found a group of pseudoscorpions under a piece of weathered mudstone. The animals were all S. hanseni and each adult female was enclosed in a cocoon of stone particles held together with silk. The cocoon walls were roughly circular and about 5mm in diameter and 2mm high. Presumably these cylinders were closed off by the other side (the bottom) of the crevice in which they were built. Savory (1966) mentions that false scorpions building inside a crevice often continue their cocoon into an igloo shape.

Cocoons are used by pseudoscorpions to protect themselves when moulting, as hibernation chambers and as brood chambers in which they lay their eggs and bring up their young. Two kinds of chamber were apparent in the Old Beach sample. The stone walled cocoons each contained an adult female (body length c. 3mm). Other, less regular cocoons made only of silk contained the cast skins of past instars.

Each female was carrying a brood chamber under the abdomen. When the eggs are laid they are deposited in a brood chamber which is secreted by the oviduct walls. After hatching, the larvae, which are still attached to the female by short beaks are pumped full of yolk by the female and swell up to about three times their previous size. The brood chamber also enlarges to accommodate the larvae after refuelling, pushing the mother's now empty abdomen high in the air. Most of the S. hanseni females brought to me were at this stage and each brood chamber appeared as an inflated group of sacs - seven in all - carried under the abdomen.

S. hanseni belongs to a group of pseudoscorpions which have exocuticula - extensions of the surface cuticle which are often irregular and flaky in appearance. The gaps in the exocuticula of the adults of this sample contained particles of stone and debris providing good camouflage against the background rock. Their bodies are actually a dark grey-brown. Three nymphs were also found, each of about 1.4mm body length. Each nymph was grey-green in colour and not covered in debris like the adults. The silk mounting cocoons contained exuviae of one smaller size only so these were presumably second stage nymphs.

As pseudoscorpion nymphs moult to the adult stage they acquire more tactile setae on their limbs and mouthparts. The larvae in this sample only had one long seta on the moveable finger of the pedipalp in contrast to two (2) in the adults.

These notes provide a little more information about the natural history of S. hanseni. Much more information awaits the observer. If naturalists find pseudoscorpions the museum will identify the animals. Information about these animals may be found in Savory (1966) who also gives instructions on methods of keeping pseudoscorpions in captivity.

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Savory, T. H. 1966 - False Scorpions. Scientific American 214 (3) : 95 - 100. (Available as a Scientific American offprint from booksellers).

SUBSCRIPTION RATES

Because of ever increasing costs it has regrettably become necessary to increase subscriptions. The new rates are :-

Ordinary Membership	$ 4.50
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BOOK REVIEWS

Bird Life by Ian Rowley (Collins Australian Naturalist Library, $9.50)

Ten years ago there was no adequate field guide to the identification of Australian birds, ecology was a seldom used term and the subject of ethology (animal behaviour) was almost unhead of. Today, we have a number of adequate books on bird identification, ecology is a concept discussed with varying degrees of comprehension by all, and the subject of ethology has recently achieved significant scientific status with the award of a Nobel prize to its founders. Consequently, the time was ripe for the publication of a book concerned with the ecology and ethology of the Australian avifauna rather than with species identification. "Bird Life" by Ian Rowley is such a book and represents a most important extension to the range of ornithological literature available on the Australian region.

With the field guides presently available it is possible, with a little perseverance, to become competent at species identification. However, if the ornithologist is to sustain enthusiasm in his subject, an interest must be developed which extends beyond the purely mechanical listing of species seen. In "Bird Life" Rowley shows how developing such an interest can lead to fascinating studies of the life history of bird species. Anyone previously unacquainted with the subject matter will,

after reading this book, look at birds with an added dimension of awareness. This is a book concerned with what birds do, how they do it and why each species does its thing in its own unique way.

In the first part of the book the reader is introduced to concepts such as the adaptation of bird species to an existence in different types of habitat, bird behaviour and the factors governing avian reproductive cycles. A constant theme of this part of the book is the influence of the Australian climate on avian evolution in the Australian region. Indeed, Australian studies have shown that many species have adapted to an existence in the arid regions by the development of complex social organization and it has been necessary to revise the Northern-hemisphere orientated concepts which were developed from the font of evolutionary thinking, Victorian England.

The second part of the book is concerned with summarising studies of Australian species. Significantly, most of the work described has been carried out over the past 15 years. In this section the author draws on examples of his own work (Superb Blue Wren Malurus cyaneus and the Australian Raven Corvus coronoides), that of his colleagues in the Wildlife Division of the C.S.I.R.O. (e.g. Frith's study of that extraordinary species the Mallee Fowl Leipoa ocellala) as well as that of independent workers (e.g. Dow's study of the Noisy Miner Manorina melanocephala and Parry's work on the Kookaburra (Dacelo gigas). Descriptions of work on the Tasmanian Native Hen Tribonyx mortiere (Ridpath) and the Tasmanian Mutton-bird Puffinus tenuirostris (Serventy) provide excellent local contant.

In conclusion, this book represents a significant advance in ornithological literature on the Australian region, bringing much of what is best in Australian ornithology to the general public in a condensed form. However, what has been achieved is dwarfed by the task ahead, and it is confidently anticipated that this book will stimulate a number of both professional and amateur ornithologists of the future to a lifetime of rewarding study.

MIKE NEWMAN

Australian Bush Birds in Colour, by Irene and Michael Morcombe
(A.H. & A.W. Reed, $4.95).

We have come to expect high quality birds photos from the camera of Michael Morcombe, and in this small book he and his co-author have produced a gallery of outstanding pictures as good as anything they have shown before. In the most attractive assortment of some 48 species it is difficult to separate any from the viewpoint of perfection, though perhaps one of the more interesting is his study of the Rufous Scrub-bird. It is extremely hard just to be able to see this elusive little creature in life, let alone to photograph it.

Studies of birds in flight, added to others in brilliant plumage, make this a charming publication. The only thing that strikes a rather unnatural note - this no doubt unavoidable with flash - is found in the birds' eyes where two, and sometimes three, highlight spots reflect this number of separate light sources, to some detriment.

Each colour plate is accompanied by a description of habits, nesting, food, and other useful information.

M. SHARLAND

MARIA ISLAND BIRDS

L. E. Wall

NATIONAL PARKS AND WILDLIFE SERVICE has included in its small publication on Maria Island National Park a list of the birds found there, based on reports by D. R. Milledge (1968), P. Temple-Smith (1968), R. H. Green (1969) and J. H. Hemsley (1969).

In this list the Emu and Cape Barren Goose have been noted as introduced, and other species since introduced by National Parks and Wildlife Service are :- Eastern Rosella, White Cockatoo, Tasmanian Native Hen, Black Swan, Brown Quail, Black Duck, Grey Teal, Chestnut Teal, Blue-winged Shoveler and Bald Coot. A comparison with previous records, some unpublished, are interesting.

The first detailed list I have read is that of Legge (1887) although Hall (1912) refers to a list prepared by the early explorer Baudin who deposited a list in Paris. Baudin's list included reference to the "Goueland gris" which Hall could not identify. Legge's list included the following which do not appear in the current list:- Brown Bittern, Blue-winged Shoveler, Mountain Duck, Black Swan, Pelican, Curlew, Lewin Water-rail, Common Bronzewing, Little Lorikeet? Tawny Frogmouth, Grey Shrike-Thrush, Emu Wren. As mentioned above several of these have been re-introduced by National Parks & Wildlife Service but most of them are waterfowl which are strongly nomadic and there cannot be any optimism that they will be permanently re-established on the island.

The next published list available to me is Hall (1912) in which he included the following :- Painted Quail, Common Bronzewing, Northern Rosella, Azure Kingfisher, Spine-tailed Swift, Grey Butcherbird, Brown Thornbill, Superb Blue Wren, Wedge-tailed Eagle, Blue-billed Duck, Blue-winged Shoveler, Black Swan, Pied Cormorant, Sooty Albatross. Almost all of these were identified by him personally but there are two which deserve special mention. The Pied Cormorant (Phalacrocorax hypoleucus) is included as well as the White-breasted Cormorant, but the Little Pied Cormorant (P. melanoleucus) is not. This provides a puzzle because the Pied Cormorant (now P. varius) has been included on the Tasmanian list by Mathews (1915) and later authorities, possibly because of this record, although none has quoted a particular occurrence. Tas. Bird Report No. 1 (1971) quotes the first definite record for the Tasmanian area as occurring on King Island in that year.

Hall also mentions in the text "There were quite large flocks of the parrot peculiar to Tasmania (Platycercus browni)" and in the list at the end refers to it as "yellow-billed parrakeet (Platycercus browni)". He did not list the Green Rosella (P. caledonicus) which used to be known commonly as the Yellow-billed Parrot, and because the Northern Rosella (P. browni) is restricted to the northern part of Northern Territory and the Kimberley region of Western Australia I believe that the Green Rosella (P. caledonicus) was what he saw.

It is interesting to note that many of those listed by Legge were again listed by Hall 25 years later and some of them, although not included in the National Parks and Wildlife Service list, have been observed by others in recent years.

(To be continued)

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The Tasmanian Naturalist

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FURTHER CRAGGY ISLAND RECORDS

J. S. Winray

CRAGGY ISLAND is in eastern Bass Strait between the Furneaux Group and Kents Group. Some details of it were given in Tasmanian Naturalist No. 30 : 4-6, August 1972 and were the result of my two day visit in March and April of that year. Two more visits have since been paid to the island. They were from 14-22 June, 1972 and on 6 November, 1972.

BIRDS

Two of the fifteen species mentioned in the first article were tentative records. I took field glasses for the June visit and was able to determine these doubtful species. I found that a pair of Nankeen Kestrels Falco cenchroides and a pair of Peregrine Falcons Falco peregrinus were present. As well, I was able to determine a single small bird which was seen on the island in March but was not mentioned in the first article because I could not obtain an adequate description without field glasses. It was a female Flame Robin Petroica phoenicia.

In June Fairy Prions Pachyptila turtur and Common Diving Petrels Pelecanoides urinatrix were still landing in large numbers on the island at night. The latter species was even found occupying burrows under large boulders. In November I checked some Common Diving Petrel burrows on the southern side of the island. The nestlings ranged from a tiny downy bird to one which was adult size and had no down left on its wings, throat or head. During the same visit I found one Fairy Prion on an egg under a small boulder at the summit of the north east peak. I collected the following specimens in March :- Pelecanoides urinatrix – National Museum of Victoria B10881, Queen Victoria Museum 1972.2.37; Pachyptila turtur –NMV B10882, QVM 1972.2.38.

Little Penguins Eudyptula minor were still coming ashore in large numbers in June. Moulting had finished and neither eggs nor immature birds were seen. On the late afternoon of 17 June I noticed a Little Penguin flock just off the north coast and it landed soon after. There were at least eight more flocks and the three largest ones contained from three to four hundred birds each. They were moving slowly towards the shore but were still up to 800 metres off it when I stopped watching.

On 19 June Miss Christie and I watched the flocks until a small one came ashore at the middle of the north coast at 4.10 p.m. This flock kept close together until the birds were a few metres offshore when they spread suddenly and landed. Next day Miss Christie watched them and the first flock landed at 4.25 p.m. No flocks were seen off the south coast during this visit. In November some Little Penguins were sitting on eggs in burrows.

In March no Muttonbirds Puffinus tenuirostris were seen but in June Miss Christie and I found five dessicated carcases at the western and north eastern ends of the island. One specimen was taken to the National Museum of Victoria and discarded after checking. Although Sooty Oystercatchers Haematopus unicolor were absent in March, at least fourteen were present in June. In November this species was nesting and I saw two nests with eggs while another member of the party noticed a third nest with eggs. One new seabird species, the Giant Petrel Macronectes giganteus, was seen in June. A pair flew close inshore past the island. No Silver Gulls Larus novaehollandiae were seen during the three visits. However, on the way to Kents Group on 30 November 1972, I saw some Silver Gulls just south west of the island and then a few landed on one of the rocks at its western end.

Two pairs of Cape Barren Geese Cereopsis novaehollandiae were seen in March and a flock of thirteen was seen in June. During the latter visit I watched one bird feeding on Rookery Fireweed Senecio capillifolius at the summit of one of the peaks. In November seven goslings (two and a group of five) and twelve adults were seen. Two of the latter were moulting and could not fly. The other ten were seen together.

About twenty Brown Quail Synoicus australis were seen on the island in both March and June. During the latter visit one was caught in a boxtrap set amongst Coast Saltbush Atriplex cinerea and Australian Hollyhock Lavatera plebeja var. tomentosa on the northern slope below the central saddle (NMV B11171).

Two Brown Falcons Falco berigora were seen on the island in both June and November. A White-breasted Sea Eagle Haliaeetus leucogaster visited the island on one day in June. When it left the island it headed for Sheoak Point, Flinders Island.

Two of the species recorded in March were not present during the later visits. They were the Welcome Swallow Hirundo neoxena and Grey Fantail Rhipidura fuliginosa.

Finally I will contrast the numbers of the other birds seen during March and June. Pacific Gull Laurus pacificus (9 March, 33 June); White-faced Heron Ardea novaehollandiae (16, 2); Black-faced Cormorant Phalacrocorax fuscescens (12, 1); Australasian Gannet Morus serrator (1, 2); Blackbird *Turdus merula (12 plus, 30 plus) and Grey-breasted Silvereye Zosterops lateralis (15 plus on the first two visits and 20 plus in November). The Grey-breasted Silvereye specimen which I collected in March is QVM 1972.2.39.

These records bring the number of species recorded to twenty one, excluding the Muttonbird.

PLANTS

A list of twenty six species was given in the original article. In June five more species were found on the island. I found the native Water Buttons Cotula coronopifolia and the three alien species Barley Grass *Hordeum leporinum, Fourleaf Allseed *Polycarpon tetraphyllum and the Common Sowthistle

*Sonchus oleraceus in shallow soil on coastal outcrops at the base of the gully running south from the central saddle. They occurred, together with other native species, over thirty square metres and were not present anywhere else on the island. These four herbs were grazed heavily by the Cape Barren Geese which might have introduced them to the island. Miss Christie found the alien Common Chickweed *Stellaria media amongst Blue Tussockgrass Poa poiformis and Rookery Firewood Senecio capillifolius on the ridge west of the central saddle. Later I noticed that it grew right down to the central saddle and then a little way down the gully to the south of it.

In November I collected specimens of Stiff Ryegrass *Lolium loliaceum from the shallow coastal soil mentioned above. This grass was not seen anywhere else.

One of the species on the original list was misdetermined because the specimens were weathered and incomplete. I obtained good specimens in November and found that the Foxtail Fescue *Vulpia megalura occurs on the island and not the Rats-tail Fescue *Vulpia myuros. Specimens of two uncertain species from the first visit have since been determined at the National Herbarium of Victoria. They are the Sea Pearlwort Sagina maritima and Leafy Peppercress Lepidium foliosum.

These records bring the number of plants recorded on the island to thirty two. Six are alien species and they make up eighteen percent of the total. A complete list of Craggy Island plants is given below.

LICHENS

More specimens were collected in June and, like the March specimens, were donated to the National Herbarium of Victoria. The herbarium numbers of the full collection are 1,013,013-1, 013, 039 and 1,013, 041-1, 1,013, 067. About twenty five species were obtained from the island. Two were listed in the original article and nine more have been determined by Mr. R. B. Filson. One of these, which came from coastal granite and looks much like an alga, is a new record for Bass Strait. It is Mastodia tessellata Hook. f. & Harv. apud Hook. The other eight species are Anaptychia pseuospeciosa var. tremulans (Müll. Arg.) Kurokawa, Caloplaca elegans (Link.) Th. fr., Diploicia canescens (Dicks.) Mass., Lecanora atra (Huds.) Ach., Ochrolechia parella (L.) Mass., Parmelia caperata (L.) Ach., Physcia caesia (Hoffm.) Hampe and Lichina pygmaea var. intermedia Bab.

REPTILES

Only Metallic Skinks Leiolopisma metallicum were seen or collected in March and June. All the specimens have been lodged at the National Museum of Victoria (NMV D18136, D42519-42525). In November I disturbed two White's Skinks Egernia whitii under boulders on the summit of the north east peak but was not fast enough to catch either of them.

LIST OF CRAGGY ISLAND PLANTS, 1972

An asterisk marks a non-Tasmanian species. H marks specimens lodged at the University of Tasmania Herbarium and M marks specimens lodged at the National Herbarium of Victoria.

FERN

HM Asplenium obtusatum
Shore Spleenwort

MONOCOTYLEDONS

Poaceae

HM* Vulpia megalura
Foxtail Fescue

HM Poa poiformis
Blue Tussockgrass

HM Sporobolus virginicus
Salt Couch

HM*Lolium loliaceum
Stiff Ryegrass

HM*Hordeum leporinum
Barley Grass

Liliaceae

HM Dianella revoluta
Blackanther Flaxlily

H Bulbine semibarbata
Leek Lily

DICOTYLEDONS

Chenopodiaceae

HM Atriplex cinerea
Coast Saltbush

H Rhagodia baccata
Seaberry Saltbush

HM Chenopodium glaucum ssp. ambiguum
Coast Goosefoot

H Salicornia quinqueflora
Beaded Glasswort

Aizoaceae

M Disphyma blackii (formerly D. australe
Rounded Noonflower

M Carpobrotus rossii
Karkalla

M Tetragonia implexicoma
Bower Spinach

Portulacaceae

Calandrinia calyptrata
Pink Purslane

Caryophyllaceae

HM*Stellaria media
Common Chickweed

HM Sagina maritima
Sea Pearlwort

HM Spergularia media
Coastal Sandspurrey

*Polycarpon tetraphyllum
Fourleaf Allseed

Cruciferae

HM Lepidium foliosum
Leafy Peppercress

Crassulaceae

Crassula sieberiana
Austral Stonecrop

Mimosaceae

HM*Albizia lophanta
Cape Wattle

Rutaceae

HM Correa alba
White Correa

Malvaceae

HM Lavatera plebeja var. tomentosa
Australian Hollyhock

Apiaceae

H Apium prostratum
Sea Celery

Apocynaceae

H Alyxia buxifolia
Sea Box

Lobeliaceae

H Lobelia alata
Angled Lobelia

Asteraceae

HM Brachycome diversifolia var. maritima
Tall Daisy

M Cotula coronopifolia
Water Buttons

HM Senecio capillifolius
Rookery Fireweed

* *Sonchus oleraceus
Common Sowthistle

PLANTS ON MOUNT WELLINGTON, Feb. 1975

Kelsey Aves

ON 22 February, 1975, the Club's field excursion was to Mt. Wellington. Apparently utterly destroyed by the terrible fires which devastated southern Tasmania in February 1967, the vegetation of the mountain has shown remarkable powers of regeneration, especially on the lower slopes, though more slowly the nearer one gets to the summit, where harsher climatic conditions naturally inhibit lush growth. However, on the moor at the head of the N. W. Bay River near the 'ice rink', the peat itself had burned so deep that recovery seemed impossible. Yet many of the fascinating cushion plants Abrotanella forsterioides have survived and are slowly recovering their domed shape and we were delighted with unusually large masses of Gentian Gentianella diemensis in flower, also Celmisia, Helichrysum, and Euphrasia spp. in quantity. The 'elfin' trees of Snow Gum Eucalyptus coccifera near Mt. Arthur, however, suffered very severely in the fire and although many have coppiced, there is little growth on the trunks and boughs. Waratah Telopea truncata and Richea dracophylla are regenerating well from the Springs to the shelter shed at 1,000 M. It was also noted that most species seem to have flowered later than usual this year, perhaps due to the unusually cold early summer, including January.

The party selected three areas for observation - the first 1 Km of the Collins Bonnet track at about 1,100 M., the head of the N. W. Bay River (ice rink' area) at 1,180 M., and an area from the Pinnacle about 0.5 Km south at 1,270 M.

We are very much indebted to Mrs. Margaret Allan for listing and checking identification of flowering and fruiting plants of these regions. Her lists follow.

PLANTS RECORDED FROM COLLINS BONNET TRACK, 1100M 22.2.75

Acaena anserinifolia fruit
Asperula conferta fls.
Astelia alpina fruit

Baeckea gunniana fls.
Bauera rubioides fls.
Billardier a longiflora fruit

Calorophus minor (Hypolaena lateriflora of Rodway)
Carpha alpina
Celmisia asteliafolia fls.
Coprosma sp.

Epacris serpyllifolia spent fls.
Epilobium gunnianum (?) fls. & fruit
Eucalyptus coccifera
Erigeron pappochroma fls. & fruit
Euphrasia diemenica fls.
" striata fls.

Gahnia psittacorum
Gentianella diemensis fls.
Geranium microphyllum fls.
Gleichenia sp.
Haloragis sp.
" micrantha fls.

Helichrysum expansifolium fls.
" ledifolium fls.
" scorpioides fls.
Hierochloe redolens (Sweet Holy Grass)
Hydrocotyle sibthorpioides fruit

Leptospermum lanigerum
Lomatia polymorpha fls.
Luzula sp.

Monotoca empetrifolia

Olearia obcordata
" phlogopappa
Orites diversifolia
" revoluta
Oxylobium ellipticum

Pimelea sericea fls.
Poa alpina
Polystichum proliferum
Pooranthera microphylla fls.
Prasophyllum alpinum fls.
" suttonii fls.

Ranunculus spp.
Restio australis
Richea sprengelioides
Rubus gunnianus

Scaevola hookeri fls. & fruit
Senecio lautus fls.
Sprengelia incarnata

Tasmannia lanceolata
Telopea truncata
Thelymitra venosa fls.

Veronica nivea fls.
Viola hederacea

Wahlenbergia saxicola fls.

PLANTS RECORDED AT "ICE RINK", 1180M 22.2.75

Abrotanella forsterioides
Acaena anserinifolia
Asperula conferta fls.
Astelia alpina fruit

Baeckia gunniana fls.
Bellendena montana

Carpha alpina
Coprosma sp.
Craspedia alpina fls.
Cyathodes dealbata berries

Drosera arcturi fruit

Epacris serpyllifolia spent fls.
Epilobium gunnianum (?) fls & fruit
Erigeron pappochroma fls.
Eucalyptus coccifera
Euphrasia diemenica fls.
" striata fls.

Gentianella diemensis fls.
Gleichenia sp.

Helichrysum backhousii fls.
" hookeri fs fls.
" ledifolium fls.
Helichrysum scorpioides fls.

Leptospermum lanigerum
" rupestre fls.
Luzula sp.

Monotoca empetrifolia

Olearia algida fls.
" ledifolia fls.
" pinifolia
Orites acicularis
" revoluta
Ourisia integrifolia fruit

Pimelea sericea fls.
Prasophyllum alpinum fls.
" suttonii fls.
Restio australis
Rubus gunnianus

Scaevola hookeri fls.
Sphagnum
Sprengelia incarnata

Tasmannia lanceolata
Thelymitra venosa

PLANTS RECORDED AT THE PINNACLE, 1270M 22.2.75

Acaena montana fruit

Baeckea gunniana fls.
Bellendena montana fruit

Celmisia asteliafolia fls.
" saxifraga fls.
Cythodes dealbata

Epacris serpyllifolia
Euphrasia striata fls.
Exocarpos humifusus

Helichrysum ledifolium fls.

Leptospermum rupestre fls.
Luzula sp.
Lycopodium fastigiatum (?)

Monotoca empetrifolia

Orites acicularis
" revoluta

Pentachondra pumila fls. & fruit

Richea scoparia
" sprengelioides

MARIA ISLAND BIRDS

L. E. Wall

(concluded from Tasmanian Naturalist No. 40)

I am not aware of any other published records except a note by Hall (1910) about a King Penguin which I regarded as unsubstantiated (ref Tas. Naturalist No. 33) and a few notes on individual species appearing in Tas. Bird Report No. 3.

During a visit to the northern end of Maria Island in December 1961 I saw a Superb Blue Wren, and it seems this is the last record of the species on the island : many observers in recent years have failed to find it. I did not see any Forty-spotted Pardalotes and they had never been recorded from Maria Island at that time. Neither the Brown Thornbill nor the Tasmanian Thornbill were seen during that visit.

Another visit was made in April 1974 when I went as far south as the Neck. In the vicinity of Four Mile Creek, where the track moves out of pure Blue Gum forest into a mixed forest of White Gum and Blue Gum, were many Forty-spotted Pardalotes, the first I had seen on the island, and it was in the same area that I saw a Brown Thornbill. I did not see any Tasmanian Thornbills during this visit. A Wedge-tailed Eagle was added to the list also, a single bird soaring round the southern slopes of Mt. Maria.

In November 1974 a further brief visit was made to the northern end of the island allowing two hours of observations about Darlington and Bernacchi's Creek. The Tasmanian Thornbill was seen here and a suggestion that the recent introduction of the Tasmanian Native Hen had been unsuccessful was proved false - two were seen on the creek bank.

The Forty-spotted Pardalote provides a puzzle. On three visits I have never found it near Darlington where the trees are predominantly Blue Gum, but it is very plentiful between Four Mile Creek and the Neck where the forest has a good mixture of Blue Gum and White Gum. However, D.R. Milledge and D.G. Thomas have found it plentiful near Darlington. There are other indications, as yet unconfirmed, that the species is to some extent nomadic outside the breeding season.

The question also arises - was the species present in 1912 when Tasmanian Field Naturalists' Club members camped on the island? It is not clear from the published

Camp Report that members covered the overland route from Darlington to the Neck though it is certain that a party did travel to the Neck by boat. I am inclined to think that the colony may have been there but remained undetected.

The Tasmanian Thornbill and the Brown Thornbill also provide interesting speculation. Both Legge and Hall recorded the Brown Thornbill only, though it must be remembered that at the time of Legge's visit the Tasmanian Thornbill had been "lost" for many years and it was not until early in this century that it was "re-discovered" and its status as a true species confirmed. Because of his intimate knowledge of Australian ornithology Hall would have been well aware of this and it seems doubtful that he would have overlooked it if he had seen it on Maria Island. I did not see either of these thornbills in the vicinity of Darlington in 1961, but in April 1974 I saw one Brown Thornbill near Four Mile Creek and no others, while in November 1974 I saw a few Tasmanian Thornbills near Darlington. D.R. Milledge, with a fairly extensive knowledge of Maria Island, says that the Tasmanian Thornbill is not uncommon but he has never seen a Brown Thornbill.

Other additions to the Bird List for Maria Island are – (1) J.R. Napier has told me that he has seen a Southern Black-backed (or Dominican) Gull on the island, and (2) Tasmanian Bird Report No. 3 records the Turnstone.

Footnote: An error occurred in the first part of this paper (Tas. Naturalist No. 40, Feb. 1975). In the 7th and 8th lines from the bottom of the page the name "Yellow-billed Parrot" should read "Yellow-bellied Parrot".

References:

Legge, W.V. 1888. A first list of the birds of Maria Island. Pap. Proc. R. Soc. Tas. for 1887; 83-97

Hall, R. 1912. Tas. Field Naturalists' Club Easter Camp-out 1912 to Maria Island – The Birds of Maria Island.

NAL MUSEUM JUN 1975 VICTORIA

REMINDER OF OLD BATTERY POINT ZOO

Michael Sharland

AT "Beaumaris," Battery Point, Hobart, more than half a century ago, there was a zoo, kept by Mrs. Mary Roberts, a self-styled zoologist with a distinct "way" with animals. The collection, a mixture of birds and mammals, some of them exotic, numbered between 200 and 300 animals, and was contained in her extensive grounds on the present site of the Postal Department's depot. Mrs. Roberts was acclaimed by the Zoological Society of London for being the first to breed the Tasmanian devil, of which she once had three or four pairs. A number of Thylacines also passed through her hands. Just how many is not known. But she had no success in breeding from them.

After her death, on 27 November, 1921, her trustees made a gift of the collection to the Hobart City Council. And so it formed the nucleus of what became known as the Hobart Zoo, established with Government assistance to the extent of £250 a year. A former sandstone quarry opposite Government House was chosen as the site of this zoo, which remained in existence until about 1933, since when there has been no "official" zoo – one financed by public funds.

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NOTES ON BETSEY ISLAND

R. R. Shepherd

BETSEY ISLAND extends to 170 hectares (420 acres) and is owned by the Tasmanian Museum.

Thirty-two members of the Tasmanian Conservation Trust visited the island on 7th April, 1974. The trip from Hobart was made in the M. L. "Lorne" in ideal weather conditions. The party was transferred to a dinghy for landing on the rocky, northern coastline, not far from the north-eastern corner of the island.

The only general information available about the island is published in the Tasmanian Naturalist, Volume II, No. 2 (August, 1951), in which a visit to the island by members of the Tasmanian Field Naturalists' Club in March 1951, is described. In the 1974 visit, time spent on the island was limited to 2½ hours and only a cursory inspection could be made in the time. However, with possible assistance to future visitors in mind, it was considered worthwhile to collate the observations made by various members of the party. Where possible a comparison has been made of the 1951 and 1974 findings.

1. Discovery by Europeans and History (Contributed by D. R. Gregg)

The island was sighted by Tasman in 1642. D'Entrecasteaux charted it in 1773 and gave it the name Isle Willaumez after his sailing officer Lieutenant Willaumez.

John Hayes in 1793 renamed the island Betsey Island. In later years the island was given to Jane Franklin, wife of the Governor, who wished to use it as a place to introduce plants and animals. Parts of the island were cleared and a few buildings erected. Lack of permanent water proved a real difficulty and the island never fulfilled the high hopes of Lady Franklin.

In 1868 the island was presented to the people of Tasmania by Lady Franklin and in 1903 it was vested in the Trustees of the Tasmanian Museum under the name Franklin Island.

The island was officially named Betsey Island in 1955.

Several attempts have been made to farm the island with sheep and even with rabbits. It was leased in the 1910's and 1920's for rentals of something like 25 shillings per year.

In 1928 the island was declared a sanctuary and there were reports that mutton-birds were once more breeding there. In 1936 the Trustees dealt with complaints that the "Military" had used the island during manoeuvres. In 1937 the Department of Agriculture requested permission to carry out experiments on the island on the control of rabbits by myxomatosis.

2. Geology (Contributed by D. R. Gregg)

The geology of the island has been described by David Green (1961 : Papers and Proceedings of the Royal Society of Tasmania, Volume 95 : 17-34).

Quartzose sandstone of probable Triassic Age crops out on the north-eastern end of the island. This sandstone is in fault contact with the dolerite, of Jurassic Age, which forms the rest of the island.

3. Vegetation (Contributed by J. Jarman, and R. R. Shepherd)

From a floristic point of view the island is rather similar to the nearby mainland with the possible exception of a larger range of grass species.

Trees are found only on the northern half of the island and present a savannah-like landscape. The main species is Eucalyptus globulus but a few E. viminalis are scattered throughout the woodland. In places Acacia melanoxylon and Dodonea viscosa make a closed understorey.

The introduced species Albizzia sp. and Agave americana are common to the northern side of the island but appear to be absent elsewhere. Fairly tall Acacia melanoxylon occur along the eastern side and Casuarina stricta are found mainly along the western side. The southern side is treeless with grasses and sedges forming a low, open community. The dominant sedge, Lomandra longifolia is widespread on the island.

A species list is given in Appendix 1.

4. Introduced Mammals

About six dark-coloured rabbits were seen during the visit and four dried bodies and several skulls were collected.

5. Birds (Contributed by Mr. L. E. Wall)

Two lists of birds were compiled, one while travelling by boat to and from the island, the other while on the island. A comparison of these lists with lists made in March 1951 showed little difference in the birds recorded. The lists are given in Appendix 2.

6. Invertebrates (Contributed by Miss A. Green)

(a) Crustacea. Two species of terrestial Isopoda were found under stones on the shore, near the high tide level :-

(i) Ligia australiensis Dana - the shore slater. This is a native species which occurs near high tide level, on rocky shores in south-eastern Australia, including Tasmania.

(ii) Porcellio scaber Latreille - the garden slater. An introduced species originally from Europe but now cosmopolitan. P. scaber normally lives inland but it is not unusual to find it on the sea shore.

(b) Mollusca

(i) Tasmanembryon tasmanicus Pleiffer - a tree snail.
Two animals were found on dead, exotic wattle trees.
T. tasmanicus occurs only in northern and eastern Tasmania near the coast.

(ii) Caryodes dufresnii Leach - a land snail.
C. dufresnii is endemic to Tasmania.

7. General

Previously cleared areas in the north and centre of the island are still visible - no trees, old ploughing lines and many heaps of stones gathered off the cultivated areas. The bush is encroaching slowly around the perimeters of these old clearings, the advancing species being mainly A. melanoxylon, D. viscosa and E. globulus. The old pastures contain a range of introduced weed species, notably Hypochaeris radicata and Leontodon leysseri. The clearings are grazed closely by rabbits and several burrows and scrapings were seen around the stones and the remains of an old hut near the centre of the island.

The island is classified by the National Parks and Wildlife Service as a Conservation Area, primarily because of its important Mutton Bird rookeries. In many parts the ground is honeycombed with rookeries and penguin burrows.

The Tasmanian Conservation Trust is indebted to the Trustees of the Museum for permission to land on the island.

APPENDIX I

Plant Species List

(Compiled from observations by Miss J. Jarman, Mrs. J. E. S. T. Townrow, Messrs. A. Beswick, A. M. Hewer, L. E. Wall and R. R. Shepherd).

Dicotyledons

(a) Indigenous species

CAMPANULACEAE
Wahlenbergia sp. (o)

CARYOPHYLLACEAE
Colobanthus apetalus (lf)

CASUARINACEAE
Casuarina stricta (o)

CHENOPODIACEAE
Chenopodium glaucum (o)

CONVOLVULACEAE
Dichondra repens (o)

Dicotyledons - (cont'd.)

COMPOSITAE
Cassinia aculeata (r), Gnaphalium sp. (o), Senecio sp. (o)

EPACRIDACEAE
Astroloma humifusum (r), Leucopogon parviflorus (f), Lissanthe strigosa (lf)

EUPHORBIACEAE
Amperea xiphoclada (r)

FICOIDEAE
Carpobrotous rossii (f), Tetragonia implexicoma (o)

GERANIACEAE
Geranium microphyllum (o)

LEGUMINOSAE
Acacia melanoxylon (lf), A. mearnsii (r), A. verticillata (lf), Kennedia prostrata (o)

MYOPORACEAE
Myoporum insulare (f)

MYRTACEAE
Eucalyptus globulus (f), E. viminalis (o)

ONAGRACEAE
Epilobium sp. (o)

OXALIDACEAE
Oxalis corniculata (lf)

PITTOSPORACEAE
Bursaria spinosa (r)

ROSACEAE
Acaena novae-zelandia (f)

RUBIACEAE
Galium australe (r)

RUTACEAE
Correa alba (o)

SAPINDACEAE
Dodonaea viscosa (o)

UMBELLIFERAE
Hydrocotyle sp. (o)

(b) Introduced species

CARYOPHYLLACEAE
Cerastium fontanum (r)

CHENOPODIACEAE
Atriplex hastata (o), Chenopodium glaucum (r)

COMPOSITAE
Carduus pycnocephalus (r), Cirsium arvense (o), C. vulgare (r), Hypochaeris radicata (o), Leontodon leysseri (lf), Sonchus asper (r)

GENTIANACEAE
Centaurium erythraea (o)

LEGUMINOSAE
Albizzia sp. (f)

PRIMULACEAE
Anagallis arvensis (f)

POLYGONACEAE
Rumex acetosella (o), R. pulcher (o)

SCROPHULARIACEAE
Verbascum thapsus (o)

Monocotyledons

(a) Indigenous species

CYPERACEAE
Lepidosperma gladiatum (o), L. longitudinale (o), L. concavum (o), Scirpus nodosus (o)

GRAMINAE
Agropyrum scabrum (f), Agrostis avenacea (o), Aira caryophyllea (o), Danthonia caespitosa (o), Danthonia purpurascens (o), D. racemosa (o), D. setacea (f), Deyeuxia quadrisecta (o), Dichelachne crinita (o), D. sciurea (o) Distichlis distichophylla (f), Monerma cylindrica (r), Poa poiformis (f), P. sieberana var sieberana (f), Stipa compacta (o), S. stuposa (o)

LILLIACEAE
Dianella revoluta (f), Lomandra longifolia (f)

(b) Introduced

AMARYLLIDACEAE
Agave americana (f)

Monocotyledons - (cont'd.)

GRAMINAE
Holcus lanatus (f), Cortaderia sp. (r)

Pteridophytes

DENNSTAEDTIACEAE
Asplenium flabellifolium (o), Pteridium esculentum (lf)

POLYPODIACEAE
Phymatodes diversifolium (o)

r	=	rare
o	=	occasional
f	=	frequent
lf	=	locally frequent

Of the 11 species recorded in 1951, all were seen with the exception of Carduus lanceolatus.

APPENDIX 2

Bird Species List

			1951	1974
A.	Birds seen while travelling by boat to and from the island			
	Little Penguin	Eudyptula minor	-	*
	Black-browed Albatross	Diomedea melanophris	*	-
	Muttonbird	Puffinus tenuirostris	*	*
	Australian Gannet	Morus serrator		*
	Black Cormorant	Phalacrocorax carbo	-	*
	Little Pied Cormorant	Phalacrocorax melanoleucos	-	*
	Black-faced Cormorant	Phalacrocorax fuscescens	*	*
	Artic Skua	Stercorarius parasiticus	*	*
	Pacific Gull	Larus pacificus	*	
	Dominican Gull	Larus dominicanus	-	*
	Silver Gull	Larus novaehollandiae	*	*
	Crested Tern	Sterna bergii	*	*
B.	Birds seen on the island			
	Little Penguin	Eudyptula minor	*	*
	Black-faced Cormorant	Phalacrocorax fuscescens	-	*
	White-faced Heron	Ardea novaehollandiae	*	9
	Wedge-tailed Eagle	Aquila audax	-	3
	White-breasted Sea Eagle	Haliaeetus leucogaster	*	-
	Brown Hawk	Falco berigora	-	*

		1951	1974
Quail sp.		-	*
Pacific Gull	Larus pacificus	*	*
Silver Gull	Larus novaehollandiae	*	*
Eastern Rosella	Platycercus eximius	*	*
Blackbird	Turdus merula	-	*
Spotted Pardalote	Pardalotus punctatus	*	*
Grey-breasted Silvereye	Zosterops lateralis	-	*
Black-headed Honeyeater	Melithreptus affinis	-	*
Crescent Honeyeater	Phylidonyris pyrrhoptera	*	-
New Holland Honeyeater	Phylidonyris novaehollandiae	-	*
Noisy Miner	Manorina melanocephala	*	*
Grey Butcher-bird	Cracticus torquatus	*	*
White-backed Magpie	Gymnorhina hypoleuca	*	-
Forest Raven	Corvus tasmanicus	*	*

EASTER CAMP 1975 – WADDAMANA

THE Club held its annual Easter Camp for 1975 at Waddamana in the Central Highlands. The accommodation was at the Chalet, now a field study centre for the Education Department.

The main object of the Club was to carry out a botanical survey of an area within 2 km of the township for the Education Department so that a comprehensive list of herbarium material could be prepared for study on site by students of the various schools who now attend this centre at regular intervals.

Waddamana, meaning "large river" in the dialect of the Big River tribe of aborigines, was established in 1916 when water of the Great Lake was directed by means of canals and pipelines to a power station in the valley of the River Ouse, over 1000 feet lower in altitude.

The rapid change in physiography from montane to sub-alpine conditions within a short distance from the township gave added interest to the field study.

Field excursions were made to Lake Echo and Penstock Lagoon. A wide range of plants were noted, details of which are given in this report.

We are indebted to Mrs. Allan for valuable assistance in identification.

PLANTS RECORDED AT WADDAMANA 29.3.'75

Acacia dealbata
Acaena anserinifolia
Acaena ovina
Ajuga australis
Asperula conferta

Bedfordia linearis
Billardiera longiflora
Blechnum procerum
Bossiaea riparia
Brachyloma ciliatum

Callistemon pallidus
Carex appressa
Cassinea aculeata
Coprosma hirtella

Plants recorded at Waddamana 29.3.'75 - cont'd.

Cotula filicula
Cyathodes parvifolia
Cynoglossum suaveolens

Daviesia latifolia

Epilobium sp.
Eucalyptus amygdalina
" delegatensis
" pauciflora
" rubida
" viminalis

Geranium microphyllum
Gnaphalium sp.

Hakea microcarpa
" lissosperma
Helichrysum antennarium
" dendroideum
" scorpioides
" semipapposum
" thyrsoideum
Hypericum gramineum
" japonicum

Juncus pallidus

Lagenophora stipitata
Leptorhynchos squamatus
Leptospermum lanigerum
Leptospermum nitidun
Leucopogon hookeri
Lomatia tinctoria fruit

Muehlenbeckia adpressa

Notelea ligustrina

Olearia algida
" myrsinoides fls.
" phlogopappa
" ramulosa
" viscosa
Oxylobium ellipticum

Pimelea humilis
Pittosporum bicolor fruit
Plantago sp.
Polystichum proliferum
Pomaderris apetala
Pultenaea juniperina

Richea procera
Rubus parvifolius fls. & fruit

Scleranthus biflorus
Senecio linearifolius
Senecio sp.
Stylidium graminifolium

Themeda australis

Viola hederacea

Wahlenbergia consimilis

PLANTS RECORDED AT LAKE ECHO VIA BASHAN PLAINS 29.3.'75

Acacia dealbata
Acaena anserinifolia
Acaena ovina
Ajuga australis

Coprosma sp.
Cyathodes parvifolia

Eucalyptus amygdalina
Eucalyptus pauciflora

Geranium microphyllum

Hakea lissosperma
Haloragis sp.

Helichrysum scorpioides
Hydrocotyle sp.
Hymenanthera angustifolia fruit

Leptorhynchos squamatus
Leucopogon hookeri

Olearia algida

Poa sp.

Ranunculus sp.

Veronica gracilis

Wahlenbergia consimilis

Macquarie

(TO BE CONTINUED)

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NOTES ON THE DISTRIBUTION AND HABITAT OF THE TASMANIAN LAND MOLLUSCA

R. C. Kershaw (Honorary Associate, Queen Victoria Museum)

Summary :

Scientists have long been aware of widespread relationships between Tasmanian land mollusca and that of other parts of Australasia. In the past the distribution of the 'Tasmanian' forms was attributed to climatic variation. Hedley (1896) reported a Tasmanian colony "stranded on Mt. Kosciusko". Land bridges were postulated to account for relationships with New Zealand. Re-definition of the species tended to obscure these affinities in the opinion of various workers.

Much more is known about the fauna, together with increased knowledge of climatic and geologic features influencing migration. Some notes are offered here on habitat and relationships, with brief comment on some associated problems.

Introduction:

In eastern Australia Iredale (1937) recognised the Euronotian Faunulae and the Bassian Faunulae based on his studies of land mollusca. The latter faunulae were to be found from southern Queensland to Tasmania. He noted New Zealand affinities but tended to give reduced importance to these.

Obvious resemblances between Victoria and Tasmania, coupled with the presence of the Tasmanian aborigines, gave an early stimulus to the idea of possible land bridges across Bass Strait. Hedley (1896), intrigued by his finds on Mt. Kosciusko, suggested that a continuous fauna with Tasmania governed by climate was indicated. He felt that a glacial epoch, evidence of which was being noted by geologists, stimulated migration of Tasmanian molluscs. The withdrawal of the climate reversed the migration leaving some of their members stranded on the mountain heights.

But this did not explain the affinities with New Zealand and with other parts of Australia. Why did not a bold and active snail like Caryodes dufressnii find its way into Victoria (Kershaw & Dartnall, 1972). How does one account for the presence of Bothriembryon (Tasmanembryon) tasmanicus in Tasmania when all its relatives are in Western and South Australia. In fact, there was a tendency to look for eastern Australian relatives for this snail.

Land Snails in Tasmania

Iredale referred in several of his papers on land mollusca to the preference for dry conditions by his family Paralaomidae (now known to belong to the family Punctidae). The idea was based at first on the finding of individuals of the genus Paraloama Iredale 1913 on the surface of dry rocks. Later other species were also found in dry situations. The family Punctidae with the other group of very small snails of family Charopidae make up a large proportion of the Tasmanian snail fauna. It is not always easy to tell them apart. It would be helpful if habitat was a guide, particularly as the Charopidae were claimed to prefer moist conditions. However I soon found that it would be unwise to rely on such a rule in Tasmania.

There is of course some truth in these claims. But as Iredale pointed out himself, Australian snails aestivate during the dry periods of summer or drought Dryness is then a relative term when applied to snail habitat. Thus, in wet Tasmanian forests snails may be found during most of the year. In dryer eastern and midland localities they may not be in evidence for months at a time.

A damp situation in snail terms is one then where rainfall reliability is high or drainage and vegetation provide a suitable habitat. Thus, the Gippsland Lakes region of Victoria has a low rainfall with high reliability which encourages the presence of charopid species. On the other hand, although the sand dunes of the Furneaux Group have similar rainfall, other factors are entirely different.

How then could charopids live in this situation, as they do, if they are adapted only to very moist conditions. Perhaps interdune swales provide pockets from which snails could move onto the dunes when conditions became suitable. However, I have found species of the family on dunes in north eastern Tasmania where no convenient pocket existed. All they seem to need is plenty of litter and shelter. It seems apparent then that care is needed in defining the habitat even of individual species.

It would be incorrect to infer that every tiny species found in a damp situation belongs to the Charopidae. In one such situation careful search revealed only one species of Pernagera but a number of species of the Punctidae, as well as other snails. This was in rain forest near Tarraleah in Central Tasmania. In fact all Tasmanian collectors have been aware of this distribution. Punctidae can and do occupy dryer situations than many Charopidae, but may also occupy closely similar situations. Thus the Punctid snail Trocholaoma lives in fern gullies in north western Tasmania. But, as Iredale has pointed out, the tiny Charopidae are never exposed and he used the term cryptozoic life for them.

Shelter then is the operative factor for it is obvious that species of Pernagera and Discocharopa survive in relatively dry situations. Geminoropa by comparison is a genus of the wet forests of Tasmania and New Zealand.

I have experimented with the native slug Cystopelta which, lacking a shell, could be susceptible to dryness. It is found in wet forests on Mt. Barrow, in tea tree 'swamps' and in sclerophyll forest near the Tamar River. My observations were carried out in the latter area (Kershaw, 1957). Slugs allowed air but not moisture survived only for 24 hours, but in the absence of both, less than 3 hours. Helicarion by comparison remained alive in a matchbox for a week, but less than 3 days in an airtight tin.

In this area of variable rainfall the summer may be long and dry. Cystopelta survives such conditions for in 1955 with higher than normal rainfall it was very plentiful.

A search was therefore made during the summer for a suitable habitat which would enable survival. This proved to be a depression filled with a mulch of rotting leaves where the soil remained moist for long periods. Here was Cystopelta curled up well below the dry surface providing for the future breeding stock of the species.

In this area the Charopidae were represented by a species of Elsothera as well as large forms formerly placed in the Family Flammulinidae. In some places there were many Punctidae, Helicarion and the predator Strangesta. Hence if the habitat provides enough moisture for survival of breeding stock the species survive. It is not enough to look at the family but rather at the genus or the species in study of the habitat. In Tasmania it is not difficult to find evidence that many species survive a very wide range of conditions, while some are very selective.

Tasmania appears to have many natural boundaries to the spread of species. Various forms do appear to exist which have adapted to restricted habitat. Much has been made of geographical situation in allowing the validity of species in lists (Iredale, 1937). Victaphanta milligani does in fact live only in the rain forests of western Tasmania, Bothriembryon tasmanicus only in the eastern coastal country, and Anoglypta launcestonensis in the north eastern rainforest. Caryodes dufressnii has produced a giant rain forest form and a dwarf sclerophyll forest form.

Despite these examples most geographic determinations have been found misleading and a closer ecological study is required. There remains the similarity, perhaps not necessarily uniformity, of species between Tasmania and Victoria. Can this be due to Pleistocene migration? We have seen that this does not account for all the problems. In fact Tasmanian snails have adapted to a wide range of conditions which may be due to the glacial period. But the relationships seem to be much less easy to account for, much older than this. Species have been found over a wider range than originally thought. Hence the idea of isolated colonies of Tasmanian snails is not necessarily a valid one. The Pleistosene Epoch certainly saw variation in the range and nature of the habitat, which probably had a degree of associated snail migration. Conclusions on the significance of this are probably still premature. However it is known that the snail fauna is much older than was thought in the past (Solem, 1959). Hedley believed he was seeing specific relationships. Iredale, on the other hand, favoured family and generic levels separating Hedley's forms as distinct species. My own notes of the 1950's indicate that I favoured generic or group levels as indicative of migration paths, retaining the feeling that some genera may not be valid. But I accepted Iredale's genera of the Charopidae (Kershaw, 1954) as the most convenient means of studying these snails.

The increased understanding of the fauna, its distribution and age has provided emancipation from the necessarily restricted views of Hedley's day, but in his assessment of the relationships he may well have been nearer the truth than many later workers. Further, the new concepts being provided by geologists of Gondwanaland and the mechanism of plate tectonics provides a new light in which to view the still unsolved problems in Tasmania.

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LICHENS OF MT. FIELD NATIONAL PARK

G. C. Bratt

As part of a general survey of the lichens of Tasmania the National Parks are being studied in more detail. In this note a preliminary list is given of the lichens in the South-Eastern parts of the Mt. Field National Park. Some information is given, in abbreviated form, concerning the lichen type, abundance and substrate.

The abbreviations used are –

Fo = foliose lichen leaf like lichen
SFo = small foliose lichen = leaf like lichen of reduced size (3-5 mm)
Fr = fruticose lichen = lichen with stem or strand structure
SFr = small fruticose lichen = stem or strand structure visible only with X10 lens
C = crustose lichen = lichen almost inseparable from substrate
T = occurring on trees or bushes
R = occurring on rocks
S = occurring on soil
1 = abundant in study area
2 = common in study area
3 = uncommon in study area
4 = rare in study area

The work is incomplete and heavy emphasis is placed on the listing of the larger more easily observable lichens.

1. Lower Forest Areas - e.g. Tracks to Russell & Lady Barron Falls

Baeomyces fungoides	Fr, S, 2	Collema leucocarpum	Fo, T, 3
" heteromorphus	Fr, S, 2	Hypogymmia lugubris	Fo, T, 2
Cladia aggregata	Fr, S, 1	Peltigera dolichorrhiza	Fo, S, 2
" schizopora	Fr, T, 3	Pseudocyphellaria rubella	Fo, T, 3
Cladina leptoclada	Fr, S, 3	Sphaerophorus melanocarpus	Fo, T, 1
Cladonia cornuta	Fr, S, 3	Usnea xanthopoga	Fr, T, 2

N.B. This area has been badly damaged by human agency, also this is the most poorly sampled area. Hence a much greater variety is expected to be found after more detailed examination.

2. Mixed Forest - Horizontal + Eucalypts - e.g. immediately below "Forest Walk"

Cladia Schizopora	Fr, T, 3	Pseudocyphellaria rubella	Fo, T, 2
Collema laeve	Fo, T, 3	Psoroma du Rietzii	SFo, T, 2
" leucocarprum	Fo, T, 2	" contextum	SFo, T, 2
Menegazzia retipora	Fo, T, 2	" sphinctrinum	SFo, T, 1
Polychidium umhausense	Fr, T, 4	Sagenidium molle	SFr, T, 2
Pseudocyphellaria mougeotiana	Fo, T, 2	Sticta filix	Fo, T, 1
" pseudosticta	Fo, T, 1	Usnea capillacea	Fr, T, 1
" punctillaris	Fo, T, 4	" flexilis	Fr, T, 1
" rigidula	Fo, T, 4	" xanthopoga	Fr, T, 1

3. Nothofagus Forest - e.g. "Forest Walk"

Anzia angustata	Fo, T, 3	Pseudocyptiellaria cinnamomea	Fo, T, 1
Cladia aggregata	Fr, S, 1	" faveolata	Fo, T, 2
Cladina leptoclada	Fr, S, 2	" flowtowiana	Fo, T, 2
Cladonia subdigitata	Fr, S, 1	" rubella	Fo, T, 2
Leptogium tremelloides	Fo, T, 3	Psoroma sphinctrinum	SFo, T, 1
Menegazzia retipora	Fo, T, 3	Ramalina farinacea	Fr, T, 3
" weindorferi	Fo, T, 2	Sagenidium molle	SFr, T, 2
Nephroma australe	Fo, T, 4	Sphaerophorus melanocarpus	Fr, T, 1
Parmelia tenuirima	Fo, T, 3	" tener	Fr, T, 1
Pseudocyptiellaria billardierii	Fo, T, 2	Sticta filix	Fo, T, 1

4. Higher Eucalyptus Forest - e.g. Beattie's Tarn Track

Baeomyces fungoides	Fr, S, 2	Cladonia scabriuscela	Fr, S, 2
" heteromorphus	Fr, S, 2	" subdigitata	Fr, S, 2
Cladia aggregata	Fr, S, 1	" verticillata	Fr, S, 1
" retipora	Fr, S, 1	Hypogymnia billardierii	Fo, T, 3
" schizopora	Fr, T, 2.	" lugubris	Fo, T, 1
" sullivanii	Fr, S, 1	Lecidea cinnabarina	C, T, 2
Cladonia capitellata	Fr, S, 2	Peltigera dolichorrhiza	Fo, S, 2
" chlorophaea	Fr, S, 2	Placopsis parallina	C, R, 1
" cornuta	Fr, S, 2	Pseudocyphellaria pseudosticta	Fo, T, 1
" cornutoradiata	Fr, S, 2	Psoroma paleaceum	SFo, T, 2
" crispata	Fr, S, 2	Siphula decumbens	Fr, S, 2
" furcata	Fr, S, 2	Stereocaulon ramulosum	Fr, R, 1
" pleurota	Fr, S, 2		
" pyxidata	Fr, S, 2		

5. Remnant "Pine Grove" - e.g. Lake Dobson

Note that "Pines" are rarely the substrate

Catillaria griffithii	C, R, 3	Pseudocyphellaria flotowiana	Fo, T, 2
Cladia aggregata	Fr, S, 2	" pseudosticta	Fo, T, 1
" retipora	Fr, S, 2	" rubella	Fo, T, 2
" sullivanii	Fr, S, 2	Psoroma contextum	SFo, T, 2
Cladina leptoclada	Fr, S, 2	" du Rietzii	SFo, T, 2
Collema leucocarpum	Fo, T, 1	" paleaceum	SFO, T, 2
Hypogymnia lugubris	Fo, T, 1	Psoroma soccatum	SFo, T, 2
Lecanora atra	C, R, 2	Siphula fragilis	Fr, S, 3
Leptogium burgessii	Fo, T, 2	Sphaerophorus melanocarpus	Fr, T, 1
Menegazzii foraminulosa	Fo, T, 3	" tener	Fr, T, 1
" weindorferi	Fo, T, 2	Sticta filix	Fo, T, 1
Peltigera dolichorrhiza	Fo, S, 2	" limbata	Fo, T, 4
" microphylla	Fo, S, 3	Stereocaulon corticatulum	Fr, R, 3
Pseudocyphellaria billardierii	Fo, T, 2	" ramulosum	Fr, R, 1
" crocata	Fo, R, 2	Usnea capillacea	Fr, T, 2
" flaveolata	Fo, T, 2		

6. Subalpine Moors - e.g. Tarn Shelf, Mt. Mawson Plateau, Field East & West Plateaux

Alectoria pubescens	Fr, R, 2	Parmelia conspersa	Fo, R, 2
Bilimbia sp	C, S, 2	" stygiodes	C, R, 3
Buellia wahlenbergii	C, R, 3	Pseudo cyphellaria crocata	Fo, R, 2
Cetraria islandica	Fr, S, 4	" pseudosticta	Fo, T, 1
Cladia aggregata	Fr, S, 1	Siphula complanata	Fr, S, 1
" " f. inflata	Fr, S, 4	" fragilis	Fr, S, 1
" retipora	Fr, S, 1	" moorii	Fr, S, 2
Cladina arbuscula	Fr, S, 2	Stereocaulon corticatulum	Fr, R, 2
Cornicularia aculeata	Fr, S, 4	" ramulosum	Fr, R, 1
Diploschistes scruposus	C, R, 3	Thammolia vermicularis	Fr, S, 1
Lepraria neglecta	C, S, 2	Umbilicaria cylindrica	Fo, R, 1
Menegazzia bullata	Fo, T, 2	Usnea glomerata	Fr, R, 1
" foraminulosa	Fo, T, 2		

7. Mountain Peaks - e.g. Mawson, Rodways, Field East, Seagers L/o, Field West

Agyrophora subglabra	Fo, R, 2	Placopsis gelida	C, R, 2
Alectoria pubescens	Fr, R, 3	Psoroma paleaceum	SFo, T, 3
Buellia wahlenbergii	C, R, 3	Rhizocarpon geographicum	C, R, 1
Cladia fuliginosa	Fr, S, 2	Siphula fragilis	Fr, S, 1
Diploschistes scruposus	C, R, 2	" moorii	Fr, S, 1
Lecanora atra	C, R, 2	Sphaerophorus tener	Fr, R, 3
Lecidea dicksonii	C, R, 2	Thammolia vermicularis	Fr, S, 2
Neuropogon acromelanus	Fr, R, 4	Umbilicaria cylindrica	Fo, R, 1
Parmelia signifera	Fr, R, 2	Usnea golmerata	Fr, R, 2
Pertusaria sp.	C, R, 2		

FLORA OF FRENCHMAN'S CAP NATIONAL PARK

D. Pinner

Family Myrtaceae	–	Leptospermum serviceum
		Calistomen viridiflorus
		Eucalyptus vernicosa
Family Ericaceae	–	Gaultheria hispida
Family Monimiaceae	–	Atherosperma moschatum
Family Fagaceae	–	Nothofagus gunnii
		Nothofagus cunninghamii
Family Eucryphiaceae	–	Eucryphia lucida
		Eucryphia milliganii
Family Escalloniaceae	–	Anopterus glandulosus
		Tetracarpaea tasmanica
Family Podocarpaceae	–	Phyllocladus aspleniifolius
		Pherosphaera hookeriana
		Microcachrys tetragona
		Dacrydium franklinii
Family Taxadiaceae	–	Athrotaxis selaginoides
Family Winteraceae	–	Drimys lanceolata
Family Proteaaceae	–	Cenarrhenes nitida
		Persoonia gunnii
		Bellendena montana
		Telopea truncata
		Lomatia tinctoria
		Lomatia polymorpha
		Banksia marginata

Family Epacridaceae	-	Prionotes cerinthoides
		Sprengelia incarnata
		Richea sprengelioides
		" procera
		" scoparia
		" dracophylla
		" pandanifolia
Family Gentianaceae	-	Gentianella diemensis
Family Cunoniaceae	-	Anodopetalum biglandulosum
		Bauera rubioides
Family Stylidiaceae	-	Stylidium graminifolium
Family Rhamnaceae	-	Spyridium gunnii
Family Scrophulariaceae	-	Euphrasia striata
Family Rubiaceae	-	Coprosma quadrifida
		" nitida
Family Leguminosae	-	
1. Mimosoideae		Acacia dealebata
		Acacia mucronata
		Acacia melanoxylon
Family Droseraceae	-	Drosera arcturi
Family Compositae	-	Helichrysum species
		Senecio species
		Brachycome species
		Ewartia catipes
Family Pittosporaceae	-	Billardiera longiflora

Macquarie

570.5

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WEST COAST BIRDS ISSUE

AVIAN FAUNA OF THE CROTTY AREA

P. Fielding, O.M.G. Newman, and R.W. Rose

INTRODUCTION:

This report presents the findings of surveys carried out between Mar. 1974 and Oct. 1975 of the avifauna in an area of central Western Tasmania to the east of Macquarie Harbour.

At the turn of the century the study area contained a thriving mining industry with sizeable townships at Crotty, Darwin and Kelly Basin. Today the area is virtually unpopulated with mining operations confined to the Queenstown district and areas to its north.

The West and South of Tasmania have received scant ornithological investigation in the past because of the rugged terrain, inaccessibility and the remoteness of such areas from the major centres of population in Tasmania, namely Hobart and Launceston. Green and Mollison (1961) discussed the birds of the South-West near Port Davey and Jackson et al (1975) included a bird list for the North-West (Norfolk Range). Thomas and Wall (1972) described the birds of Lake Pedder, prior to the creation of the enlarged lake.

Today the West and South-West of Tasmania are under some environmental pressure from hydro-electric power development. Some of the area reported on herein may be flooded in the future, a fact which has provided motivation for the present study.

Two separate organisations took part, the Bird Observers' Association of Tasmania (B.O.A.T.) and the Zoology Department of the University of Tasmania. The authors gratefully acknowledge the contribution of the following individuals who made records available: G. Bromfield, R. Mawbey, Mrs. A.V. Ratkowsky, N.A. Sheppard, D.G. Thomas and L.E. Wall. One of the members of the survey team (R.W.R.) was in receipt of a research grant from the University of Tasmania.

SCOPE OF THE STUDY :

Observations were made predominantly around the Kelly Basin and Franklin River Roads from about 3 km north of the Lyell Hwy. to the Hydro-Electric Commission

camp at the Franklin River. Other areas investigated included a swamp on the flats adjacent to the King River immediately to the south of the Lyell Hwy., the Crotty area and the track along the East Jukes spur, the beginning of the Fincham Track to Frenchmans Cap, the Kelly Basin track from the Nora River to Kelly Basin at Pillinger, and a track to the meteorite crater in the Andrew River basin.

Although observations were made predominantly in the vicinity of roads and walking tracks it is thought that coverage was realistic. The area was visited at all seasons and considerable time was spent in each habitat type. Some areas received intensive coverage, in particular around the Lyell Hwy. bridge over the King River and near Township Creek.

Observations involved approximately 100 man-hours.

HABITAT :

The West Coast is a high rainfall area with falls of 250 cm/annum being not uncommon. As a consequence of this, the climatic climax vegetation is temperate rainforest (Jackson 1965). However, one finds a variety of habitats reflecting not only climate but also varying soil fertilities, degrees of firing, clearing activities as well as altitude (the region studied extends from Kelly Basin at sea-level to Mt. McCall, 760 m)

In areas of frequent firing sedgeland is the predominant vegetation. Bordering sedgeland one finds wet scrub which is also present on the banks of creeks and rivers traversing the sedgeland. In areas of less frequent firing mixed forest is to be found. Mixed forest and wet sclerophyll are both common West Coast habitats. At higher altitudes moorland becomes the predominant vegetation. The habitat can be described as cold-wet adapted.

In much of the area south of the Lyell Highway to about 3 km past Township Creek, firing, milling and lack of regrowth (except at the banks of creeks) has led to a large hummock sedgeland. The predominant species in this area are Gymnoschoenus, Carpha, Juncus and Restio. In the wet scrub bordering creeks and in better drained areas one finds the Peppermint Gum and Tea-tree. The southern limit of this sedgeland merges into mixed forest which predominates along the Kelly Basin Road until it forks into the Kelly Basin track and theFranklin River Road. Along the Franklin River Road can be found rainforest, mixed forest, wet sclerophyll and on some of the slopes almost pure stands of tea-tree. As the road rises, the predominant vegetation becomes moorland. In contrast, relatively undisturbed rainforest exists along the whole length of the Kelly Basin track.

Swamp is found just south of the Lyell Highway, including several acres of spiked reed (probably Juncus). Much of the area north of the Lyell Highway is cleared land used in the past for grazing now discontinued. It has been fired recently and there are large stands of black wattle.

Anotated Species List

Distances from Lyell Highway refer to roads either following the King River to the north or leading to the Hydro-Electric Commission camp at the Franklin River to the south (The Kelly Basin Road). The Kelly Basin track refers to the track from the H.E.C. gate on the Kelly Basin Road at the Nora River to Kelly Basin at Pillinger.

Black Cormorant — Phalacrocorax carbo

Present Kelly Basin Jun. and Nov. and observed soaring over Lyell Highway near Nelson Creek west of King River. Almost certainly frequents rivers in area, although not observed.

White-faced Heron — Ardea novaehollandiae

One seen near Crotty in Mar. 1975 was the only record

Anas species

2 duck on King River near the Lyell Highway in Nov. appeared to be Grey Teal Anas gibberifrons.

Australian Goshawk — Accipiter fasciatus

1 Mt. Fincham area Mar. 1974.

Wedge-tailed Eagle — Aquila audax

Single birds seen on Darwin Plateau at 600 m in Mar. 1975 and at Township Creek in Mar. 1974.

Swamp Harrier — Circus approximans

A single bird present near Crotty in Nov. 1974.

Brown Hawk — Falco berigora

Single birds present Crotty area Mar. 1974 and 1975.

Brown Quail — Synoicus ypsilophorus

3 flushed on flats near junction of King River and Lyell Highway in Mar. 1974. Present at Crotty in Oct. 1975.

Lewin Water Rail — Rallus pectoralis

1 seen in Nov. 1974 between Baxter Rivulet and the Kelly Basin Road.

Japanese Snipe — Gallinago hardwickii

Present Nov. 1974 near King River north of the Lyell Hwy.

Brush Bronzewing — Phaps elegans

Numerous records. Obviously resident and apparently dispersed throughout area.

Yellow-tailed Black Cockatoo — Calyptorhynchus funereus

Common resident well dispersed throughout the area. Often heard rain-forest areas and seen in or passing over more open habitats. Largest flock recorded comprised 22 birds in Mar.

Sulphur-crested Cockatoo — Cacatua galerita

Present near Crotty on the Mt. Darwin foothills in Jun. and Nov. 1974.

Green Rosella — Platycercus caledonicus

Common resident, present throughout the area in the vicinity of wet sclerophyll and rainforest habitats.

Blue-winged Parrot — Neophema chrysostome

1 positively identified at the intersection of the Baxter Rivulet and the Kelly Basin Road in Mar. 1974.

Neophema parrots, species undetermined, also observed in Mar. 1974 (3 near Baxter River flying over an area of sedge and low scrub containing a number of dead eucalypts) and in Nov. 1974.

The very rare Orange-bellied Parrot Neophema chrysogaster has similar field characters to N. chrysostoma and could well occur in the area under investigation. The last recorded nesting of this species was at the south end of Macquarie Harbour from 1918 to 1923 (Hinsby 1947).

Ground Parrot — Pezoporus wallicus

Apparently resident and probably not uncommon. 4 flushed from sedge type habitat in the vicinity of the Kelly Basin Road just south of Crotty in Mar. 1974. Further records same area in Nov. 1974 and Mar. 1975. One flushed in swamp near King River just south of the Lyell Highway in Mar. 1974.

This elusive species is difficult to detect. Extensive areas of sedge type habitat appear suitable for the species. A more comprehensive census could be effected in the future by listening for the piping call, which is uttered for a period of approximately 30 minutes at dusk.

Fan-tailed Cuckoo — Cacomantis pyrrhophanus

3 Nov. records, 1 from 3 Km north of the Lyell Highway near the King River and 2 near Crotty.

Golden Bronze Cuckoo — Chrysococcyx plagosus

1 calling in wet sclerophyll approximately 8 km south of Lyell Highway and several in rainforest near start of Kelly Basin track in Nov. 1974.

Boobook Owl — Ninox novaeseelandiae

2 heard near Crotty in rainforest in Mar. 1974 and heard near Township Creek south of Crotty in Nov. This species is easily missed because of its nocturnal habits and is probably resident and not uncommon.

Spine-tailed Swift — Hirundapus caudacutus

Mar. 1974 records of 12, 30 km south of Lyell Highway and 3 low over rainforest at the meteorite crater.

Dollar-Bird — Eurystomus orientalis

1 shot by G. Hinsby near Crotty in 1918 is the only confirmed record of the species in Tasmania (Sharland 1958).

Welcome Swallow — Hirundo neoxena

A summer visitor, small numbers frequenting open lowland areas. Mar. and Nov. records at Lyell Highway bridge over King River and from the area immediately south of Crotty.

Tree-Martin — Petrochelidon nigricans

A summer visitor frequenting similar localities to the Welcome Swallow and tending to be more numerous than that species.

Australian Pipit — Anthus novaeseelandiae

Present picnic grounds at Lyell Highway bridge over King River in Mar. 1974.

Black-faced Cuckoo-shrike *Coracina novaehollandiae*

4 records of up to 2 birds from the Lyell Highway bridge over the King River and the area up to 3 km north of the bridge.

Australian Ground-Thrush *Zoothera dauma*

Resident, mainly occurring in rainforest areas. Records throughout the year along the Kelly Basin Track.

Blackbird *Turdus merula*

Present Lyell Highway bridge over King River and area to the north. No evidence that it has spread to the rainforest areas to the south.

Superb Blue Wren *Malurus cyaneus*

Common resident. Observed all habitats except rainforest. Not present button grass areas unless other vegetation types present (i.e. low shrubs).

Southern Emu-Wren *Stipiturus malachurus*

Common resident in suitable habitat. Frequents swampy and button grass areas interspersed with low shrubs. Not recorded from pure stands of button grass. Recorded between 6 and 24 km south of Lyell Highway and from teatree swamp at Kelly Basin.

Tasmanian Thornbill *Acanthiza ewingi*

Common resident throughout the area in wet habitats where an abundance of trees or shrubs exist. Not present pure button grass plains and moorland. Nest found with eggs in Nov.

Brown Thornbill *Acanthiza pusilla*

The status of this species in the area requires further investigation. Visual separation of this species from *A. ewingi* is made usually on the basis of the absence of prominent fluffy white feather tufts on the side of the vent.

Juvenile *A. ewingi* individuals banded by Mr. K. Harris at a B.O.A.T. camp-out at the University Field Station at Koonya on the Tasman Peninsula in Dec. 1975 lacked this field character. Consequently, visual reports of *A. pusilla* in rainforest in late spring and summer may well concern juvenile *A. ewingi*. The two species may also be separated by differences in crown colouration, *A. ewingi* being much more rufous, and breast markings, *A. pusilla* being streaked whereas *A. ewingi* markings are more scalloped and have a greyer base. There are also vocal differences, but differentiation on this basis requires extreme familiarity with species, and may not be useful where juveniles are concerned.

Birds appearing to be *A. pusilla* were noted from the vicinity of the Lyell Highway bridge over the King River in Nov. and Mar. The area concerned was grazed, being open with scattered shrubs and wattles, habitat more consistent with the occurrence of *A. pusilla* than *A. ewingi*.

Several records were made of individuals without white vent feathers in rainforest areas approximately 30 km south of the Lyell Highway near the Nora River. These records may concern juvenile *A. ewingi* in view of recent evidence presented above. Further investigation is desirable, preferably by examination of the bird in the hand.

Scrub-Tit *Acanthornis magnus*

Resident in rainforest and wet sclerophyll habitats. Several records in area from 25 km south of Lyell Highway to Kelly Basin, particularly near the Bird River. Also observed at Fincham Creek.

White-browed Scrub-Wren *Sericornis frontalis*

The Tasmanian sub-species commonly known as the Brown Scrub-Wren is a common resident well distributed in rainforest, wet sclerophyll and dense shrubberies.

Field-Wren *Calamanthus fuliginosus*

Common resident well distributed in button grass and open areas interspersed with light scrub.

Flame Robin *Petroica phoenicea*

Rather uncommon. Records from vicinity of Lyell Highway bridge over King River in Mar. and Nov.; habitat modified by grazing. Pair seen near Crotty in open area with light scrub in Mar.

Pink Robin *Petroica rodinogaster*

Fairly common resident favouring locations near running water in rain-forest and wet sclerophyll habitats.

Dusky Robin *Petroica vittata*

Uncommon, probably resident. Observed near Crotty and on the Darwin Platcau at 600 m. Nest found containing eggs in Nov.

Grey Fantail *Rhipidura fuliginosa*

Common and well distributed throughout all timbered areas including rain-forest. Observed all seasons, but most authorities consider this species to migrate north partially during winter.

Golden Whistler *Pachycephala pectoralis*

Records from grazed country with wattles near King River 3 km north and immediatcly south of Lyell Highway, from rainforest area near Kelly Basin and the Nora River. Also noted at Crotty.

The Golden Whistler has a preference for drier habitats than the Olive Whistler *Pachycephala olivacea*, and is listed as scarce in rainforest habitat (Ridpath and Moreau 1966).

Olive Whistler *Pachycephala olivacea*

Common resident of rainforest and dense wet habitats in the south of the study area. Also recorded approximately 3 km north of Lyell Highway.

Grey Shrike-Thrush *Colluricincla harmonica*

Common resident in all timbered areas including rainforest.

Grey-breasted Silvereye *Zosterops lateralis*

Common with records from Lyell Highway bridge over King River, Crotty area, Purgatory Gap, and near the Nora River approximately 30 km south of Lyell Highway. Present in both rain forest and more open wet habitats where there are shrubs.

Yellow-throated Honeyeater — Meliphaga flavicollis

Common resident, frequenting all timbered habitats including rainforest.

Strong-billed Honeyeater — Melithreptus validirostris

Fairly common in rainforest and wet sclerophyll habitats. Only observed south of the Crotty area.

Crescent Honeyeater — Phylidonyris pyrrhoptera

Very common resident, widely distributed throughout all timber and shrub covered wet habitats. Also noted in button grass-heath habitat at the tree line approximately 5 km from the Hydro-Electric Commission camp at the Franklin River.

New Holland Honeyeater — Phylidonyris novaehollandiae

Apparently scarce, only recorded on the Darwin Plateau at 600 m altitude in Mar. 1975.

Eastern Spinebill — Acanthorhynchus tenuirostris

Abundant at times, only one record, approximately 28 km south of Lyell Highway in rainforest, until Oct. 1975, when common in most arboreal and scrub habitats including near Crotty, Travellers Creek, Fincham Creek and rainforest on Kelly Basin Track.

Beautiful Firetail — Emblema bella

Fairly common and widely distributed in scrub habitats. Present in tea-tree swamp at Kelly Basin and in sedge/scrub areas around Crotty.

House Sparrow — Passer domesticus

Only recorded near human habitation at the Lyell Highway bridge over the King River.

Goldfinch — Carduelis carduelis

Recorded at the Lyell Highway bridge over the King River and a flock of c. 25 was seen approximately 12 km from the Hydro-Electric Commission camp at the Franklin River in Jun.

Black Currawong — Strepera fuliginosa

Common and widespread resident noted from both rainforest and more open habitats in all areas south of Lyell Hwy.

Forest Raven — Corvus tasmanicus

Resident, distributed throughout the area and observed in or over most habitat types.

DISCUSSION :

The Crotty area is the most southerly area in the west of the State to which there is direct road access for conventional vehicles. Hence, a survey of its avifauna may be used as an indicator for less accessible areas in the south.

Fifty-three species of birds have been recorded from the area under investigation, including 3 introduced species. One species recorded is an accidental vagrant to the State.

Ridpath and Moreau (1966) consider that Tasmania has 92 common species (excluding sea birds). Hence, the area under investigation has an impoverished avifauna, which is typical of wet habitat (Brereton and Kikkawa, 1963) as is prevalent in the west of the State. Dry sclerophyll, the Tasmanian habitat supporting the greatest number of species, is not represented in the study area.

Three species present in the area, Ground Parrot, Southern Emu-Wren and Scrub-Tit are often considered rare and to have a restricted distribution. It is suggested that this view is incorrect, all of these species being widely distributed in the State, particularly in the south and west (Newman, 1975). The apparent scarcity of these species arises from their secretive habitats, lack of obvious vocalization and occupation of habitat in areas which are seldom visited because of difficulties of access.

The status of one species in the South-West of Tasmania, the Orange-bellied Parrot, is a cause for considerable concern. This species is listed in the Red Book (Fisher et al 1969) as endangered with extinction. It is thought to breed in the South-West of Tasmania (Milledge, 1972), migrating to the mainland in winter. However, its present status, breeding habitat requirements, etc. are unknown. Urgent investigation is required such that areas can be reserved to ensure its survival.

The present study indicated that Neophema parrots occur in the Crotty area, but only the Blue-winged Parrot was positively identified. This species typically is found in savannah woodland and cultivated areas, and thus has a predominantly eastern distribution in Tasmania. Indeed, 1973/74 records were the first indication that the Blue-winged Parrot occurs on the West Coast south of the Arthur River (also noted at the mouth of the Henty River north of Strahan, Mar. 1974.) If recent West Coast records represent a presently occurring extensions of the Blue-winged Parrot's range, then agricultural modification of the environment may be assisting this process. For instance, grazing activities south of the Lyell Highway bridge over the King River have created a pseudo-savannah woodland type habitat. Consequently, the occurrence of Blue-winged Parrots in the Crotty area could be a recent development and the species could be in direct competition with the Orange-bellied Parrot in the area.

As previously discussed the observation of the Brown Thornbill in rainforest requires further investigation. Confusion concerning the identification and/or geographical distribution of the Tasmanian and Brown Thornbills exists throughout the range of the Tasmanian Thornbill. Recent remarks concern the possible occurrence of the Tasmanian Thornbill on Wilsons Promontory in Victoria (Cooper 1975).

Raptors, species whose presence is obvious, and identification difficult, were scarce in the area, only the Brown Hawk and Wedge-tailed Eagle being recorded more than once. The scarcity of the Swamp Harrier, a species so typical of swampy open areas in the east of the State must reflect the absence of suitable prey in the west (e.g. young of the Tasmanian Native Hen Tribonyx mortierii, Spur-winged Plover Vanellus miles and rabbits). Two other raptors, the Grey Goshawk Accipiter novaehollandiae and the White-breasted Sea Eagle Haliaeetus leucogaster were observed over the lower reaches of the Gordon River in Nov. 1974 and would be expected to occur in the Kelly Basin area on occasions. No Peregrine Falcons Falco peregrinus were observed during the survey although apparently suitable craggs for breeding are available in the study area. The Peregrine Falcon has been reported for the adjacent Frenchman's Cap area (Pinner 1976)

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BIRDS OF NORTHERN SOUTH-WEST TASMANIA

David Ziegeler

INTRODUCTION

The following list of birds was compiled on a bushwalking trip of two weeks duration, from 24 February to 11 March 1975, through the area. The route of the walk was from the Lyell Highway, down the Jane River Track, south-east to the northern end of the Prince of Wales range, over the range and into the Denison River Valley, up to the Spires, east to the Denison Range, south to Stepped Hills, into the Vale of Rasselas and out to the Gordon River Road.

The vegetation types travelled through are as follows: temperate rain forest, scrub rainforest, wet sclerophyll forest between the Lyell Highway and the Prince of Wales Range except for a strip of temperate rainforest along the Denison River and in the southern end of the Vale of Rasselas. Wet scrub and wet mallee patches were scattered throughout the area from the Denison River Valley to the Gordon River Road. Shrub moor and wet hummock sedgeland (button grass plains and moors) were the dominant vegetation formations that were walked through between the Spires and the Gordon River Road. Montane moors, dwarf shrubbery, dwarf rainforest on the Prince of Wales Range, the Spires and Denison Range and a patch of sub-alpine woodland at Lake Rhona in the Denison Range. Highland lakes and tarns provided an additional habitat in the Spires area and Denison Range.

LIST OF SPECIES

Little Pied Cormorant Phalacrocorax melanoleucos one seen on Windy Lake near the Spires and at a tarn 3 km to the south-east. Possibly the same bird 5 March and 8 March.

Wedge-tailed Eagle Aquila audax a pair seen in the Prince of Wales Range and one at Mt. Curly near the Spires, 1 March and 6 March.

Brown Falcon Falco berigora a pair seen in the Denison Range, 10 March. Another hawk was seen in the Denison Valley but was not identified because of the distance of the observation.

Bronzewing Pigeon Phaps sp. 2 flushed from the Jane River Track, not identified for certain but probably elegans because of the habitat and area.

Yellow-tailed Black Cockatoo Calyptorhynchus funereus scattered in small numbers throughout the area, two large flocks of about 30 each seen in the Spires area.

Sulphur-crested Cockatoo Cacatua galerita heard in scrub rain forest between Jane River Track and the Prince of Wales Range and one seen in the Denison River Valley.

Green Rosella Platycercus caledonicus small flocks throughout the area.

Ground Parrot Pezoporus wallicus 3 heard at dusk on 2 March, on high button grass hills north of the Spires. One seen east of Mt. Curly on 8 March, one in the Vale of Rasselas 11 March, and one under Stepped Hills on 11 March.

Boobook Owl Ninox novaeseelandiae one heard in temperate rainforest by the Denison River on the night of 1 March.

Spine-tailed Swift Hirundapus caudacutus flocks seen flying over button grass plains along the Jane River Track on 24 and 25 February. A flock of about 25 seen on the Prince of Wales Range on 1 March. A few seen above buttongrass in the Denison River Valley on 2 March. Two seen on the Denison Range on 10 March.

Tree Martin Petrochelidon nigricans, two seen on the Prince of Wales Range on 1 March.

Australian Pipit Anthus novaeseelandiae, three seen on the Denison Range at an altitude of 1,100 metres.

Black-faced Cuckoo-shrike Coracina novaehollandiae heard in burnt wet sclerophyll forest along the Jane River Track.

Australian Ground-Thrush Zoothera dauma, two seen in temperate rainforest by the Denison River.

Superb Blue Wren Malurus cyaneus a party seen in open tea-tree scrub in the southern end of the Vale of Rasselas.

Southern Emu-Wren Stipiturus malachurus, scattered sporadically throughout the areas of buttongrass.

Tasmanian Thornbill Acanthiza ewingi recorded in all vegetation types throughout the area except for montane moor, shrub moor and wet hummock sedgeland.

Brown Scrub-Wren Sericornis humilis distribution as for the Tasmanian Thornbill.

Field-Wren Calamanthus fuliginosus common in shrub moor, wet hummock sedgeland from the Denison River Valley to Gordon River Road ranging up to 1,100 metres on the Denison Range.

Scrub Tit Acanthornis magnus seen in scrub rainforest and wet scrub on the western slopes of the Prince of Wales Range.

Flame Robin Petroica phoenicea heard calling at Windy Lake.

Pink Robin Petroica rodinogaster seen at Best's Rivulet on the Jane River Track, in scrub rainforest at the base of the Prince of Wales Range, a brown plumaged bird in wet scrub at Lake Curly. Heard in wet scrub in the Vale of Rosselas.

Grey Fantail Rhipidura fuliginosa seen along the Jane River Track and at the Florentine River at the southern end of the Vale of Rasselas.

Golden Whistler Pachycephala pectoralis seen at Best's Rivulet on the Jane River Track, heard in scrub rainforest near the base of the western side of the Prince of Wales Range and in wet scrub in the Denison River Valley.

Olive Whistler Pachycephala olivacea heard along the Jane River Track, western slopes of the Prince of Wales Range and at Lake Curly.

Grey Shrike-Thrush Colluricincla harmonica heard along the Jane River Track, at Lake Curly, seen in wet mallee east of Mt. Curly and in wet sclerophyll in Vale of Rasselas.

Spotted Pardalote Pardalotus punctatus heard in wet sclerophyll forest in the Vale of Rasselas.

Yellow-tipped Pardalote Pardalotus striatus, distribution as for the previous species.

Grey-breasted Silvereye Zosterops lateralis recorded along the Jane River Track to the Prince of Wales Range, in the Denison Range and in the Vale of Rasselas.

Yellow-throated Honeyeater Meliphaga flavicollis seen east of Mt. Curly, heard on Stepped Hills and common in timbered areas in the Vale of Rasselas.

Strong-billed Honeyeater Melithreptus validirostris heard on the Jane River Track.

Crescent Honeyeater Phylidonyris pyrrhoptera common throughout the area.

New Holland Honeater Phylidonyris novaehollandiae moderately common on the plains 2 km east of Mt. Curly.

Eastern Spinebill Acanthorynchus tenuirostris heard at Best's Rivulet, in scrub rainforest on the western side of the Prince of Wales Range and in the Vale of Rasselas.

Yellow Wattlebird Anthochaera paradoxa heard in wet sclerophyll forest in the Vale of Rasselas and in a patch of wet sclerophyll on Stepped Hills.

Beautiful Firetail Emblema bella heard by a scrub-choked creek north of the Spires and in sub-alpine woodland at Lake Rhona in the Denison Range.

Black Currawong Strepera fuliginosa recorded in small numbers throughout the area.

Forest Raven Corvus tasmanicus, 3 seen at the Florentine River.

CONCLUSION :

This area is uninhabited and parts of it little visited even by bushwalkers and would be virtually unstudied ornithologically.

This list would of course not be fully comprehensive of the bird fauna of the area because of the large area covered in a short period of time but provides a basis for further study in the area and may fill gaps in the knowledge of the distribution of some species.

BIRDS OF THE FAR WEST COAST OF TASMANIA

Peter Fielding

INTRODUCTION

This paper deals with the area from Renison Bell to the Pieman River. Most observations were made from the road which travels via Rosebery, Tullah, Guildford, Waratah and Corinna. The main habitats are temperate rainforest, pineforest, wet sclerophyll forest, wet mallee, wet scrub, sedgeland, paddocks, beaches and ocean.

The far west coast is a mountainous region, the major peaks being Mt. Murchison 1,275 m, Mt. Farrel 712 m, Mt. Pearse 1,001 m, Mt. Cleveland 857 m and Mt. Donaldson 435 m. There are numerous rivers and creeks. The major river is the Pieman which, unfortunately, is polluted by mining companies at Rosebery and Renison Bell. The Savage River is also polluted from mining activities. These rivers lack the birdlife found on the nearby unpolluted Donaldson River.

Mr. J. Stockley and Mr. D. G. Thomas kindly supplied me with lists of birds seen between Renison Bell and Waratah during 1974 and 1975. Their observations together with my own made during a five day visit in early-March 1975 form the basis of this paper. Others who assisted with their observations were the Pieman River Ferry Captain, hunters, fishermen and Mr. D. Murray a geologist working in the area.

ANNOTATED LIST OF SPECIES

Black Cormorant Phalacrocorax carbo

Seen at the junction of the Huskisson and Pieman Rivers near Rosebery and along the Pieman near its mouth.

Black-faced Cormorant P. fuscescens

Present near the mouth of the Pieman River.

Hoary-headed Grebe Podiceps poliocephalus

Single birds at Waratah and on the Pieman River near Corinna. Large numbers of this species irrupted into Tasmania in early 1975. Not normally present on the lower Pieman River.

White-faced Heron Ardea novaehollandiae

Common from Corinna to the mouth of the Pieman River.

Black Swan Cygnus atratus

A small flock of resident birds frequent the Pieman River near its mouth.

Black Duck Anas superciliosa

Recorded at Waratah.

Grey Teal A. gibberifrons

Recorded at Waratah.

Grey Goshawk Accipiter novaehollandiae

Irregular visitor to Corinna and heard in rainforest between Rosebery and Tullah.

Wedge-tailed Eagle Aquila audax

Occasionally seen between Savage River and Corinna. Two birds seen in rainforest near Renison Bell.

White-breasted Sea Eagle Haliaeetus leucogaster

Fairly common Pieman Head. Reported to have nested on Conical Rock during the last two years.

Swamp Harrier Circus approximans

Recorded once at Waratch.

Tasmanian Native Hen Tribonyx mortierii

Present in the Guildford district on the Hellyer and Fossey Rivers. Reported to be common at the Pieman River mouth where numbers have increased over the past few years.

Spur-winged Plover Vanellus miles

Common at Waratah and surrounding pastures. Present around Rosebery in small numbers.

Pacific Gull Larus pacificus

Three birds at the mouth of the Pieman River.

Silver Gull L. novaehollandiae

Common at the Pieman River mouth.

Caspian Tern Hydroprogne caspia

One seen at the mouth of the Pieman River.

Brush Bronzewing Phaps elegans

Widespread. Recorded near Renison Bell, Tullah, Waratah and Corinna.

Swift Parrot Lathamus discolor

Several small flocks between Renison Bell and the Hatfield River in Mar. 1975.

Yellow-tailed Black Cockatoo Calyptorhynchus funereus

Common and widespread in all habitats with trees and occasionally seen flying over sedgeland.

Sulphur-crested Cockatoo Cacatua galerita

Less common than the previous species, occurring in much the same habitats.

Green Rosella Platycercus caledonicus

Common and widespread occurring in most habitats with trees including pineforest and in paddocks.

Ground Parrot Pezoporus wallicus

Fairly common around Hardwicke Bay at the mouth of the Pieman River.

Fan-tailed Cuckoo Cacomantis pyrrhophanus

Seen near Bulgobac River and at Rosebery.

Golden Bronze Cuckoo Chrysococcyx plagosus

Heard in wet mallee at Bulgobac River and in rainforest near Renison Bell.

Boobook Owl Ninox novaeseelandiae
Present near Rosebery.

Spine-tailed Swift Hirundapus caudacutus
Observed above the Pieman River near Rosebery.

Azure Kingfisher Alcyone azurea
Reported along the Donaldson River but was not seen in the polluted Savage and Pieman Rivers.

Laughing Kookaburra Dacelo gigas
Calling in wet sclerophyll forest near Guildford and in lighter forest near the Fossey River.

Welcome Swallow Hirundo neoxena
Common townships, sedgelands and along highways through forest.

Tree-Martin Petrochelidon nigricans
Seen near Tullah and at Guildford.

Australian Pipit Anthus novaeseelandiae
Fairly common in sedgeland and grassy areas.

Black-faced Cuckoo Shrike Coracina novaehollandiae
Recorded at Waratah, Fossey and Bulgobac Rivers.

Australian Ground Thrush Zoothera dauma
Common in raingorest and wet sclerophyll forest.

Blackbird Turdus merula
Present at Waratah and Rosebery.

Superb Blue Wren Malurus cyaneus
Common and widespread in most habitats from rainforest margins to sedgelands.

Southern Emu-Wren Stipiturus malachurus
Recorded in sedgeland at Chinamans Creek, near the Pieman River mouth and at Bulgobac River.

Tasmanian Thornbill Acanthiza ewingi
Common in a variety of tree based habitats including pineforest.

Scrub-Tit Acanthornis magnus
Common in wet sclerophyll forest, stands of tea tree and rainforest. Adult feeding independent young at Corinna 7 Mar. 1975.

Brown Scrub-Wren Sericornis humilis
Common in rainforest, wet sclerophyll forest and pineforest.

Field-Wren Calamanthus fuliginosus
Common in sedgeland, wet mallee and wet scrub.

Flame Robin Petroica phoenicea
Common near the highest point on the Murchison Highway 690 m above sea level between Tullah and the Huskisson River.

Pink Robin P. rodinogaster

Widespread and common in rainforest and wet sclerophyll forest.

Dusky Robin P. vittata

Common in areas of light forest, wet mallee, rainforest - eucalypt mixtures, pineforest, sedgeland and in townships.

Grey Fantail Rhipidura fuliginosa

Common in rainforest, wet sclerophyll forest, light forest and stands of tea tree.

Golden Whistler Pachycephala pectoralis

Common in wet sclerophyll forest, light forest and pineforest.

Olive Whistler P. olivacea

Common in wet sclerophyll forest. Female feeding dependent young near Rosebery 6 Mar.

Grey Shrike-Thrush Colluricincla harmonica

Common. Wet sclerophyll forest is the preferred habitat but also occurs in pineforest.

Yellow-tipped Pardalote Pardalotus striatus

Common between Fossey and Bulgobac Rivers but not recorded further south 21 - 24 Oct. 1975. The only other record for the area is of a bird calling at Rosebery on 12 Aug. 1974.

Grey-breasted Silvereye Zosterops lateralis

Common in wet sclerophyll forest and rainforest.

Yellow-throated Honeyeater Meliphaga flavicollis

Common in a variety of tree based habitats from wet sclerophyll to light eucalypt forest and wet mallee. Occasional in rainforest.

Strong-billed Honeyeater Melithreptus validirostris

Recorded at the Fossey River and Corinna in wet sclerophyll forest. Two birds feeding on the nectar of a flowering tree deep in rainforest.

Crescent Honeyeater Phylidonyris pyrrhoptera

Common and widespread in a variety of habitats ranging from rainforest to sedgeland with scattered bushes.

New Holland Honeyeater P. novaehollandiae

One seen in a tall stand of tea tree at Corinna.

Eastern Spinebill Acanthorhynchus tenuirostris

Widespread and common particularly in rainforest 21 - 24 Oct. 1975. Scarce at other times.

Yellow Wattlebird Anthochaera paradoxa

Recorded in scattered tall eucalypts near Guildford and the Fossey River.

Beautiful Firetail Emblema bella

Recorded at Bulgobac River and Chinamans Creek. A fisherman has noticed a sharp decline in numbers at the Pieman River mouth over the last 10 years.

House Sparrow Passer domesticus

Common at Guildford, Waratah, Rosebery and Tullah.

Goldfinch Carduelis carduelis

Common at Waratah and seen deep in a pine forest near Guildford.

Starling Sturnus vulgaris

Common at Waratah and Rosebery.

Black Currawong Strepera fuliginosa

Common in a variety of habitats. Recorded on a beach at Hardwicke Bay and a single bird perched in a pineforest near Guildford.

Forest Raven Corvus tasmanicus

Common in a variety of habitats ranging from rainforest to sedgeland. Often feeds on road kills.

BIRDS OF FRENCHMAN'S CAP NATIONAL PARK

D. Pinner

1.	Hoary-headed Grebe	Podiceps poliocephalus
2.	Wedge-tailed Eagle	Aquila audax
3.	Peregrine Falcon	Falco peregrinus
4.	Yellow-tailed Black Cockatoo	Calyptorhynchus funereus
5.	Sulphur-crested Cockatoo	Cacatua galerita
6.	Green Rosella	Platycercus caledonicus
7.	Australian Ground Thrush	Zoothera dauma
8.	Southern Emu-Wren	Stipiturus malachurus
9.	Tasmanian Thornbill	Acanthiza ewingi
10.	Scrub-Tit	Acanthornis magnus
11.	Brown Scrub-Wren	Sericornis humilis
12.	Field-Wren	Calamanthus fuliginosus
13.	Scarlet Robin	Petroica multicolor
14.	Pink Robin	P. rodinogaster
15.	Grey Fantail	Rhipidura fuliginosa
16.	Golden Whistler	Pachycephala pectoralis
17.	Olive Whistler	P. olivacea
18.	Grey Shrike-Thrush	Colluricincla harmonica
19.	Grey-breasted Silvereye	Zosterops lateralis
20.	Yellow-throated Honeyeater	Meliphaga flavicollis
21.	Strong-billed Honeyeater	Melithreptus validirostris
22.	Crescent Honeyeater	Phylidonyris pyrrhoptera
23.	Black Currawong	Strepera fuliginosa
24.	Forest Raven	Corvus tasmanicus

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LICHENS OF SOUTH WEST TASMANIA

PART I – LICHENS OF THE BUTTON GRASS AREAS

by G.C. Bratt

A preliminary list of the lichens of the button grass covered plains and hills and associated areas is given herein. The list is biased towards macro-lichens and to areas readily accessible from the HEC Gordon Road network. The extreme south and west of the State have not been studied and hence any collections from such areas would be appreciated by the author.

The "South-West" is defined for the present purposes as the area to the south and west of the straight lines between Low Rocky Pt., Gordon River Power Station, Tim Shea, Weld River - Huon River Junction, Adamson's Peak and South Cape.

The South-West has already felt the effects of human activities such as fires, dam building, flooding, timber cutting and road construction. It seems important therefore to study the area before other changes are made. Ideally such studies should have commenced prior to man's activities, but this is not possible since studies of burns and regrowth suggest fires (by either natives or settlers) in the area at least as early at 1805. It was possible to study some areas before flooding occurred and some comparison between flooded and nonflooded areas is possible.

The preliminary species list together with abbreviated information on lichen type, substrate and abundance are given in Tables 1 and 2. The abbreviations used are:-

Fo	=	foliose lichen - leaf like lichen
SFo	=	small foliose lichen - leaf like lichen of reduced size (3 - 5 mm)
Fr		fruticose lichen = lichen with stem or strand structure
SFr	=	small fruticose lichen - stem or strand structure visible only with X10 lens
C	=	Crustose lichen = lichen almost inseparable from substrate
T	=	occurring on trees or bushes
R	=	occurring on rocks
S	=	occurring on soil

1 = abundant in study area
2 = common " " "
3 = uncommon " "
4 = rare " " "

TABLE 1 - AREAS NOW FLOODED BY SERPENTINE AND GORDON DAMS

Section 1 - Sand dune area at Lake Pedder (Natural State)

Cladia aggregata	Fr,	S,	2	Cladonia sp. A *	Fr,	S,	2
" retipora	Fr,	S,	2	" verticillata	Fr,	S,	2
" sullivanii	Fr,	S,	2	Hypogymnia lugubris	Fo,	T,	2
Cladina leptoclada	Fr,	S,	4	Menegazzia foraminulosa	Fo,	T,	2
Cladonia aureri	Fr,	S,	2	Siphula complanata	Fr,	S,	2
" crispata	Fr,	S,	2	Usnea xanthopoga	Fr,	T,	4

* known from elsewhere in Tasmania, but presently unnamed

Section 2 - Melaleuca Grove at Lake Pedder (Natural State)

Cladia aggregata	Fr,	S,	1	Sagenidium molle	SFr,	T,	4
" retipora	Fr,	S,	1	Siphula moorii	Fr,	S,	2
Cladina leptoclada	Fr,	S,	2	Sphaerophorus			
Hypogymnia lugubris	Fo,	T,	3	melanocarpus	Fr,	T,	3
Menegazzia foraminulosa	Fo,	T,	3	" tener	Fr,	T,	3
Pseudocyphellaria				Thelotrema decorticans	C.	T.	3
pseudosticta	Fo,	T,	4	" lepadinum	C,	T,	3
Psoroma asperellum	SFo,	T,	3	Usnea capillacea	Fr,	T,	4
" soccatum	SFo,	T,	3	" xanthopoga	Fr,	T,	3
" sphinctrinum	SFo,	T,	3				

Section 3 - Huon Plains (i.e. Plains between L. Pedder & Huon R.) including open button grass (b. g.), wooded knolls (w. k.), and exposed quartzite (e.q.) boulders. Probably burnt 1949; examined 1965.

Cladia aggregata	Fr,	S,	2(w. k.)	Cladonia verticillata	Fr,	S,	3(w. k.)
" retipora	Fr,	T,	1(b. g.)	Hypogymnia billardierii	Fo,	T,	2(w. k.)
" schizopora	Fr,	S.	3(w. k.)	" lugubris	Fo,	T,	2(w. k.)
" sullivanii	Fr,	S,	1(b. g.)	Menegazzia forminulosa	Fo,	T,	4(w. k.)
			(w. k.)	Parmelia caperata	Fo,	R,	4(e. q.)
Cladina leptoclada	Fr,	S,	2(w. k.)	Siphula moorii	Fr,	S,	1(b. g.)
Cladonia subsquamosa	Fr,	S,	3(w. k.)	" torulosa	Fr,	S,	4(b.g.)

Section 4 - Other areas

e.g. Hermit Valley and Wedge River Plains also partially examined but showed no species not listed above.

TABLE 2 - AREA NOT FLOODED BY GORDON AND SERPENTINE DAMS

Section 1 - Open Button grass plains (e.g. Arthur Plains, Plains near Picton Huon Junction, Plains en route to Jubilee Range, Blake's & Harrison's openings).

Cladia aggregata	Fr,	S, 1	Cladonia fimbriata	Fr,	S, 3
" " f. inflata	Fr,	S, 2	" furcata	Fr,	S, 3
" retipora	Fr,	S, 1	" neiroxcyna	Fr,	S, 3
" sullivanii	Fr,	S, 2	" ochrochlora	Fr,	S, 3
Cladina leptoclada	Fr,	S, 2	" pleurota	Fr,	S, 3
Cladonia aureri	Fr,	S, 1	" sp. A *	Fr,	S, 2
" boryi	Fr,	S, 2	" sp. D *	Fr,	S, 3
" capitata	Fr,	S, 2	" subcariosa	Fr,	S, 3
" capitellata	Fr,	S, 3	" subsquamosa	Fr,	S. 3
" chlorophaea	Fr,	S, 2	" verticillata	Fr,	S, 2
" cornuta	Fr,	S. 3	Siphula complanata	Fr,	S, 1
" cornutoradiata	Fr,	S, 3	" decumbens	Fr,	S, 3
" crispata	Fr,	S, 2	" moorii	Fr,	S, 4
" didyma	Fr,	S, 3	" torulosa	Fr,	S, 4

* known from elsewhere in Tasmania, but presently unnamed

Section 2 - Elevated Button Grass Ridges or Hills

(e.g. Schnells Ridge, Twelve Trees Range, Sentinels, Peak nr. Scotts Peak Dam)

Cladia aggregata	Fr,	S, 2	Menegazzia foraminulosa	Fo,	R, 4
" fuliginosa	Fr,	S, 2	" weindorferi	Fo,	R, 4
" retipora	Fr,	S, 2	Parmelia caperata	Fo,	R, 2
" sullivanii	Fr,	S, 3	" signifera	Fo,	R, 2
Cladina leptoclada	Fr,	S, 4	" sinuosa	Fo,	R, 4
" rangerferina	Fr,	S, 3	Pseudocyphellaria pseudosticta	Fo,	R, 2
Cladonia furcata	Fr,	S, 2	Rhizocarpon geographicum	C,	R, 2
" murrayi	Fr,	S, 4	Siphula decumbens	Fr,	S, 2
" sp. A *	Fr,	S, 3	Sphaerophorus tener	Fr,	R, 2
" verticillata	Fr,	S, 2	Umbilicarua cylindrica	Fo,	R, 2
Ephebe fruticosa	SFr,	R, 4	" polyphylla	Fo,	R, 2
Hypogymnia lugubris	Fo,	T, 2	Usnea glomerata	Fr,	R, 2
Menegazzia albida	Fo,	R, 2			

* known elsewhere in Tasmania, but presently unnamed.

Section 3 - Mixed Forest at creeks in button grass (e.g. Creeks dissecting Arthur Plains)

Baeomyces fungoides	SFr,	S, 3	Pseudocyphellaria pseudosticta	Fo,	T, 2
" heteromorphus	SFr,	S, 3	Psoroma sphinctrinum	SFo,	T, 2
Cladia aggregata	Fr,	S, 1	Sphaerophorus melanocarpus	Fr,	T, 2
" schizopora	Fr,	T, 3	" tener	Fr,	T, 2
Cladonia capitata	Fr,	S, 2	Thelidea splachnirima	Fo,	S, 4
Coccotrema curcurbitula	C.	T, 3	Thelotrema decorticans	C,	T, 4
Hypogymnia lugubris	Fo,	T, 3	" lepadinum	C,	T, 3
Menegazzia weindorferi	Fo,	T, 2			

Section 4 - Tracks benches into button grass (e.g. approaching Cracroft camp from North)

Baeomyces fungoides	SFr,	S, 4	Cladina leptoclada	Fr,	S, 4
Bilimbia Sp *	C,	S, 4	Cladoniopsis caespitosa	SFr,	S, 4

* known elsewhere in Tasmania, but presently unnamed.

Section 5 - Quartz outcrops in button grass plains (e.g. Serpentine Lookout near Strathgordon)

Parmelia caperata	Fo,	R, 2	Umbilicaria cylindrica	Fo,	R, 2
Rhizocarpon geographicum	C,	R, 2			

Section 6 - Recently (1972) burnt button grass (e.g. Plains north-west of Mt. Wedge, Examined 1976)

Cladia retipora	Fr,	S, 4	Siphula decumbens	Fr,	S, 4

Section 7 - Road cuttings (e.g. Road cutting 4 km beyond Strathgordon)

Initially ca. 1964 these were bare rock faces.

Now (1976) extensive coverage of -

Stereocaulon ramulosum	Fr,	R, 1	Placopsis parallina	C,	R, 1

Comparison of the species listed in Tables 1 and 2 indicate that only four species collected at Lake Pedder prior to flooding were not collected in other similar areas of the Southwest. However all these four species were widespread and common in other areas of the State. Hence on the basis of the admittedly limited collections around Lake Pedder one may conclude that nothing unique in the Tasmanian lichen flora was destroyed by the flooding.

All the button grass areas examined to date (both in the south-west and other parts of the State) appear to have basically the same lichen flora although some of the rarer species may sometimes not be located during a limited search.

The destructive effects of fire may be noted by comparison of the lists in Table 1, section 3, and Table 2, Section 4. The recovery of button grass areas after fires may also be appreciated by comparison of Table 1, section 3, and Table 2, section 1. Some of the plains mentioned in this latter list have probably also been burnt but the detailed fire history is not presently available.

The relatively rapid coverage of new rock faces (see Table 2, section 5) with species not found in other similar parts of the South west should also be noted.

Further discussion of the species lists will be more profitable when other areas of different vegetation types are examined.

In summary, the presently available evidence suggests that the effects of man on the lichen flora of the southwest may be destructive in the short term, but to have little effect in the long term.

BIRDS IN PINE PLANTATIONS IN TASMANIA

P. Fielding

LARGE tracts of natural bush have been bulldozed and burned out to make way for an increasing number of Radiata pine plantations in the north and west of Tasmania. The Pocket Year Book of Tasmania, 1974, quotes that in 1973 the net area of these plantations was 29,000 hectares of which 21,000 are on Crown land. The Forestry Commission has a target of 80,000 hectares planned for the State.

A total of 22 hours was spent studying the following plantations located in Northern Tasmania -

Forestry Commission plots : Castra, No. 5, Isandula, No. 11, Myrtle Grove, No. 18, Nietta, No. 20, Oldina, No. 22, Stoodley, No. 30;

Associated Forest Holdings plots : Railton, No. 39, Guildford, No. 40.

The numbers shown are those allotted on the Plantation map of the Forestry Commission of Tasmania.

The following lists show the various stages of development of these plots and the birds which were observed in them.

1. Birds of the closed pine forest.

This section shows the birds that were observed deep in mature pine plantations with trees 20 or more metres high, spaced 2 metres apart in long rows, mostly in plots of about 24 hectares. Most plantations consist of many such plots separated by firebreaks.

A mature forest creates a thick canopy overhead with only a small amount of light filtering through, giving the lower branches a withered appearance due to apparent lack of sunlight. Blackberry bushes, bracken fern and tree-ferns in creek-beds' are the main understorey in the Forestry Commission plantations. A.F.H. plantation No. 40, in contrast, has no shrub understorey.

A total of 5 hours' observations was made in the centre of pine plantations well away from fire-breaks and access tracks. Nowhere deep in the plantations were birds common.

Green Rosella Platycercus caledonicus. Heard calling in Nos. 20 and 40.
Fantailed Cuckoo Cacomantis pyrrophanus. Heard calling in Nos. 5, 11 and 20.
Laughing Kookaburra Dacelo gigas. Six birds observed in No. 5, and heard calling in No. 20.
Blackbird Turdus merula. Several sightings in Nos. 5 and 18, and heard calling in No. 20.
Tasmanian Thornbill Acanthiza ewingii. Observed in No. 40.
Scarlet Robin Petroica multicolor. Observed in No. 18.
Dusky Robin Petroica vittata. One bird observed in No. 40.
Grey Shrike-Thrush Colluricincla harmonica. Observed in No. 18.
Forest Raven Corvus tasmanicus. Calling in Nos. 5 and 20, and observed in No. 18.

2. Birds of partly-logged mature plantations.

When a mature plantation is thinned out by selective logging a more open habitat is created.

A total of 5½ hours was spent in this type of habitat. More species were found in these plantations than in the denser uncut forests.

Yellow-tailed Black Cockatoo Calyptorhynchus funereus. No birds were observed but chewed decayed pines were noticed in No. 11 indicating the presence of this species.

Fan-tailed Cuckoo. Calling in Nos. 11 and 20 and observed in Nos. 18 and 30.

Blackbird. Observed in Nos. 11 and 18 and heard calling in No. 20.

Superb Blue Wren Malurus cyaneus. Observed in Nos. 11 and 18.

Tasmanian Thornbill. Observed in Nos. 11 and 40.

Brown Thombill Acanthiza pusilla. Several sightings in Nos. 18 and 30.

White-browed Scrub Wren Sericornis frontalis. One bird observed among piles of dead branches on the ground between rows of trees in Nos. 30 & 40.

Scarlet Robin. Observed in Nos. 11, 18 and 20.

Dusky Robin. Observed in Nos. 11, 20, 30 and 40.

Grey Fantail Rhipidura fuliginosa. Observed in Nos. 18 and 30.

Grey Shrike-Thrush. Observed in Nos. 18 and 30.

Grey-breasted Silvereye Zosterops lateralis. Observed in No. 18.

Goldfinch Carduelis carduelis. Observed in No. 40.

Forest Raven. Observed in Nos. 11 and 18.

3. Birds on the margins of mature plantations.

A total of 8½ hours was spent on the margins of unlogged and partly logged mature forests and from firebreaks and tracks within them. Widths of the tracks and fire-breaks ranged from 3 metres to 12 metres. Some native vegetation was growing in these situations.

Birds were slightly more common as compared with the centres of these plantations which are poorly populated by birds.

Accipiter sp. Either an Australian Goshawk or a Collared Sparrowhawk was observed at Nos. 5 and 11, flying between rows of pines.

Tasmanian Native Hen Tribonyx mortierii. Observed at No. 22.

Brush Bronzewing Phaps elegans. Observed at No. 18.

Green Rosella. Observed at No. 30.

Fan-tailed Cuckoo. Observed at No. 22.

Blackbird. Observed at Nos. 5, 20, 22 & 30.

Superb Blue Wren. Observed at Nos. 5, 20, 22 and 30.

Tasmanian Thornbill. Observed at Nos. 5, 11, 20 and 40.

Brown Thombill. Observed at No. 18.

White-browed Scrub Wren. Observed at Nos. 5, 11, 18 and 40.

Scarlet Robin. Observed at Nos. 20 and 22.

Flame Robin Petroica phoenicea. Observed at No. 22.

Dusky Robin. Observed at No. 20.

Grey Fantail. Observed at Nos. 5, 11, 18 and 22.

Golden Whistler Pachycephala pectoralis. Observed at No. 5, and heard calling at Nos. 20 and 40.
Grey Shrike-Thrush. Observed at No. 5, and heard calling at Nos. 20 and 40.
Grey-breasted Silvereye. Observed at Nos. 5, 18 and 30, where 100 birds were observed feeding on seeds in a fire-break.
Goldfinch. Observed at Nos. 5, 20 and 22.
Starling Sturnus vulgaris. Observed at Nos. 5 and 20.
Black Currawong Strepera fuliginosa. Observed at No. 40.
Forest Raven. Heard calling at Nos. 5, 11 and 20, and observed at 22.

4. Birds in young plantations.

A total of 3 hours was spent in young plantations that have tree heights between 1 and 3 metres. In a plot of 3-metre high pines at No. 20 there was no native vegetation growing with the pines and only two species of birds were observed, compared with fourteen species at a similar plot at No. 19 where native vegetation grew amongst the pines.

Where native vegetation grows among or on the margins of plantations more birdlife occur: when this vegetation disappears the number of birds declines.

Swamp Harrier Circus approximans. Observed flying above No. 39.
Tasmanian Native Hen. One adult and two young ran from a nearby paddock into No. 39.
Phaps species. A pigeon, possibly a Brush Bronzewing, was observed deep in No. 39.
Blue-winged Parrot Neophema chrysostoma. Observed deep in No. 39 and also at the margin. They appeared to be feeding on seeds of a native bush growing amongst the pines.
Fan-tailed Cuckoo. Heard calling from within No. 39.
Welcome Swallow Hirundo neoxena. Observed flying above No. 39.
Blackbird. Observed at the margin and heard calling from No. 39.
Superb Blue Wren. Observed at the margin and deep within No. 39.
Tasmanian Thornbill. Observed at the margin of No. 20.
Brown Thornbill. Observed at the margin and deep within No. 39.
Yellow-rumped Thornbill Acanthiza chrysorrhoa. Observed at the margin of No. 39.
Field Wren Calamanthus fuliginosus. Observed at the margin and deep within No. 39.
Grey Fantail. Observed at the margin of No. 39.
Grey-breasted Silvereye. Observed at the margin of No. 39.
Goldfinch. Observed at the margin of Nos. 20 and 39.
Dusky Wood-Swallow Artamus cyanopterus. Observed at the margin of No. 39.
Forest Raven. Observed at the margin of No. 39.

SUMMARY

The following numbers of species have been found in Tasmanian Pine Plantations at various stages of development —

in mature plantations	9 species	in margins of mature plantations	21 species
in partly-logged plantations	14 species	in young plantations	17 species

Tht total number of species found in all plantations was 29. Four species – Fan-tailed Cuckoo, Blackbird, Tasmanian Thornbill and Forest Raven - were found in all stages.

Twenty species were observed in a native forest near the West Gawler River in half an hour's observations, while it took twelve hours to find this number in pine plantations.

By comparison, d'Andria (1968) found 14 species in a plantation in A.C.T. in seven hours of observations and Pawsey (1951) in South Australia found 21 species in a fifteen year study.

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ANOTHER ROYAL PENGUIN IN AUSTRALIA

R. M. Tyson

A Royal Penguin Eudyptes chrysolophus schlegeli Finsch, 1876 was found alive on the beach at Falmouth on Tasmania's east coast at 16:00 hours on the 15th March 1975.

The finder, Mr. J.H. McManus, left the bird on the beach overnight. The following morning the bird appeared in a weak condition and Mr. McManus took it to his house and tried to feed it, taking it regularly to the sea to keep it's plumage wet. However the penguin died on 17 March and was sent to the Departmentof Agriculture, Mt. Pleasant Laboratories, Launceston. There the body was checked for parasites and I prepared a study skin which has been lodged with the Queen Victoria Museum, Launceston, reg. no. 1975/2/33. It was in partial moult, it's crest not fully developed and it showed dusky markings on the face and chin. Upon dissection it was found to be a sub adult female.

Two other specimens of this subspecies have been collected in Australian waters. One found on 12 April, 1952 is housed in the Tasmanian Museum, Hobart reg. no. 10028/B2658 (Cashion, 1953). Another was collected at Encounter Bay, South Australia on 22 February, 1933 and lodged in the South Australian Museum, Adelaide reg. no. B16739. (Condon, 1950).

There are four additional sight records from Tasmanian waters. One at Eaglehawk Neck on 22 February, 1944 (Hindwood and Sharland 1944). Another at Coles Bay on 23 February, 1945 (Sharland 1946). Another at Eaglehawk Neck on 16 to 18 March, 1952 (Cashion 1953) and the fourth at Safety Cove on 19 March, 1974 (Wall 1974).

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The Tasmanian Naturalist

No. 46 *August, 1976*

LICHENS OF SOUTH WEST TASMANIA

PART II MOUNTAIN PEAKS AND PLATEAUX

G.C. Bratt

This is an extension of the preliminary lichen species listing given in Part I and hence the same limitations, boundaries and definitions apply. A further limitation arises from the cursory nature of some collections and because, particularly on dolerite peaks, the lichens are often hidden in crannies and gaps between boulders. Any further material either from the listed or unlisted peaks would be appreciated.

The species lists are given in Table I, which includes abbreviated information on lichen type, substrate and abundance. The abbreviations used are as in Part I.

TABLE I - LICHENS OF MOUNTAIN PEAKS AND PLATEAUX OF S.W. TASMANIA

1. Mt. Picton, Dolerite, Fire Damaged about 1946. 1327 m

Hypogymnia lugubris	Fo, R, 4	Stereocaulon caespitosum	SFr, R, 4
Siphula complanata	Fr, R, 3	" trachyphloeum[1]	Fr, R, 3
" fragilis	Fr, R, 3		

[1] Species recently discovered in Tasmania and N.Z. Description in press.

2. Mt. Mueler Peaks & Plateau Dolerite 1120 - 1200 m

Baeomyces heteromorphus	SFr, S, 3	Hypogymnia lugubris	Fo, T, 1
Cladia fuliginosa	Fr, S, 2	Siphula torulosa	Fr, S, 4
Cladina cf arbuscula	Fr, S, 3	Sphaerophorus tener	Fo, S, T, 1
" leptoclada	Fr, S, 3	Stereocaulon caespitosum	SFr, R, 2
Cladonia boryii	Fr, S, 2	Thamnolia vermicularis	Fr, S, R, 3
" capitata	Fr, S, 2	Umbilicaria cylindrica	Fo, R, 2
" pleurota	Fr, S, 2	Usnea capillacea	Fr, T, 3
" subdigitata	Fr, S, 2	" glomerata	Fr, R, 2
Diploschistes scruposus	C, R, 4		

3. Mt. Anne Area. Mostly dolerite with quartzite outcrops

3.1 Mt. Sarah Jane. Dolerite. Cursory collection. 1180 m

Siphula fragilis	Fr, R, 3	Umbilicaria cylindrica	Fo, R, 3
Sphaerophorus tener	Fr, R, 3		

3.2 Mt. Anne. Dolerite. 1320 m

Diploshistes scruposus	C, R, 4	Stereocaulon caespitosum	SFr, R, 4
Hypogymnia lugubris	Fo, R, 4	" vesuvianum	Fr, R, 3
Siphula fragilis	Fr, R, 4	Umbilicaria cylindrica	Fo, R, 3

3.3 Mt. Eliza. Dolerite. 1289 m

Buellia pulchella	C, R, 4	Stereocaulon corticalum	Fr, R, 4
Pertusaria sp.	C, R, 1	" ramulosum	Fr, R, 3
Sphaerophorus tener	Fr, R, 2	" tracyphloeum[2]	Fr, R, 3

[2] Species recently discovered in Tasmania and N.Z. Description in press.

3.4 Plateau near Mt. Eliza. Dolerite. 1240 m

Baeomyces heteromorphus	SFr, S, 4	Cladonia subdigitata	Fr, S, 4
		Coccotrema cucubitula	C, S, 1
Cladia fuliginosa	Fr, S, 2	Siphula complanata	Fr, S, 2
" leptoclada	Fr, S, 2	" fragilis	Fr, S, 2
Cladonia murrayii	Fr, S, 4		

3.5. Boulders on Anne-Eliza Plateau. Dolerite. 1220 m

Biatora sp.	C, R, 3	Parmelia signifera	Fo, R, 2
Diploschistes scruposus	C, R, 2	Sphaerophorus tener	Fr, R, 2
Hypogymnia lugubris	Fo, R, 2	Stereocaulon caespitosum	SFr, R, 2

3.6 Quartzite Peak area. Quartzite. 1320 m

Cornicularia aculeata	Fr, S, 3	Siphula complanata	Fr, S, 1
Hypogymnia alpicola	SFo, R, 1	Sphaerophorus tener	Fr, R, 2
Rhizocarpon geographicum	C, R, 1	Usnea glomerata	Fr, R, 2

4. Mt. Wedge. Dolerite. Fire damaged between 1909 and 1953

Buellia pulchella	C, S, 4	Cladina leptoclada	Fr, S, 3
Cladia aggregata	Fr, S, 3	Stereocaulon ramulosum	Fr, S, 3

5. Mt. La Perouse. Sandstone. Cursory Collection. 1157 m

Parmelia signifera	Fo, R, 3	Siphula complanata	Fr, S, 3
		Stereocaulon ramulosum	Fr, R, 3
Rhizocarpon geographicum	C, R, 3		

6. Mt. Snowy. Dolerite. 1160 m

Cladia fuliginosa	Fr, R, 2	Siphula fragilis	Fr, R, 2
Hypogymnia lugubris	Fo, R, 2	" torulosa	Fr, R, 2
Psoroma hypnorum	C, S, 4	Sphaerophorus tener	Fr, R, 2
Siphula complanata	Fr, R, 2	Stereocaulon caespitosum	SFr, R, 4
" foliacea	Fr, R, 2		

7. Mt. Hartz. Peak & Plateau

7.1 Mt. Hartz Peak. Dolerite. 1255 m

Baeomyces heteromorphus	SFr, R, 3	Lecidea cf achropholia	C, R,4
Bilimbia sp.	C, P, 3	Menegazzia aeneofusca	Fo, R,4
Cladia aggregata	Fr, S, 3	Pertusaria sp.	C, R,3
Cladonia boryii	Fr, S, 3	Siphula complanata	Fr, R,3
" subdigitata	Fr, S, 3	" fragilis	Fr, S, 3
Hypogymnia lugubris	Fo, R, 3	Sphaerophorus tener	Fr, R, 3

7.2 Mt. Hartz Plateau. Dolerite. 760 - 1000 m

Baeomyces fungoides	SFr, S, 2	Cladia sullivanii	Fr, S,1
Cladia aggregata	Fr, S, 1	Cladia leptoclada	Fr, S,3
" " f. inflata	Fr, S, 1	Coccotrema curcubitula	C, S,4
" fuliginosa	Fr, S, 1	Placopsis brevilobata	C, R,2
" retipora	Fr, S, 1		

8. The Needles - Peaks & Plateau. Quartzite. 1000 m

Aspicilia alpina	C, R, 2	Menegazzia aeneofusca	Fo, R,4
Cladia aggregata	Fr, S, 3	" albida	Fo, R,4
" retipora	Fr, S, 2	" bullata	Fo, R,3
" sullivanii	Fr, S, 3	Ochrolechia sp.	C, R,4
Cladina cf. arbuscula	Fr, S, 2	Parmelia signifera	Fo, R,2
Cladonia murrayii	Fr, S, 1	Pseudocyphellaria pseudosticta	Fo, R,2
" pleurota	Fr, S, 2	Siphula moorii	Fr, S,1
" subdigitata	Fr, S, 2	Sphaerophoropsis stereocaulonoides	SFr, S,3
" cf. subrangiformis	Fr, S, 2	Sphaerophorus tener	Fr, R,2
Cystocoleus niger	SFr, R, 4	Umbilicaria cylindrica	Fo, R,2
Hypogymnia lugubris	Fo, R, 3	Usnea glomerata	Fr, R,1
Leptotrema sp.[3]	C, S, 4		

[3] Undescribed; recently discovered Tasmanian endemic.

9. Tim Shea. Quartzite conglomerate. 952 m

Baeomyces heteromorphus	SFr, S, 3	Hypogymnia lugubris	Fo, T,2
Cladia aggregata	Fr, S, R,3	Leptotrema sp.[3]	C, T,4
" retipora	Fr, S, 2	Menegazzia aeneofusca	Fo, R,4
" sullivanii	Fr, S, 2	Parmelia signifera	Fo, R,2
Cladonia cornuta	Fr, S, 3	Siphula complanata	Fr, S,2
" murrayii	Fr, S, 2	Sphaerophorus melanocarpus	Fr, R,3
" pleurota	Fr, S, 2	" tener	Fr, R,3
" cf. subrangiformis	Fr, S, 2	Stereocaulon ramulosum	Fr, R,2
" verticillata	Fr, S, 2	Umbilicaria cylindrica	Fo, R,1
Cystocoleus niger	SFr, R, 4	" polyphylla	Fo, R,2
		Usnea glomerata	Fr, R,2

[3] Undescribed; recently discovered Tasmanian endemic.

The species lists of Table 1 indicate an individualistic lichen flora for each mountain which cannot be generalised. The main factors affecting the floras are probably fire history and climate, but lack of information precludes detailed comment. The main features apparent at the present time are :-

1. Few species on peaks obviously burnt, e.g. Picton and Wedge.

2. Many more species on quartzite peaks (e.g. Needles and Tim Shea), but it is not clear if this is due to substrate or lower altitude.

3. More species on doleritic plateaux than doleritic peaks, due to more shelter and greater diversity of habitat.

4. Most common and widespread species are Baeomyces heteromorphus, Cladia aggregata, Cladina leptoclada, Hypogymnia lugubris, Parmelia signifera, Siphula complanata, Siphula fragilis, Sphaerophorus tener, Stereocaulon caespitosum and Umbilicaria cylindrica.

5. Some species expected to be commonly present (from observations on other mountains) are either rare (e.g. Thamnolia vermicularis) or absent (e.g. Agyrophora subglabra, Neuropogon acromelanus).

ERRATUM

Part 1 (Tasm. Nat. No. 45) contains several errors on page 4:
4th last para. Table 2, Section 4, should read Table 2, Section 1.
3rd last para. Table 2, Section 5, should read Table 2, Section 7.

TASMANIAN AQUATIC NON-MARINE MOLLUSCA.
PART II LYMNAEA

Ron. C. Kershaw.

(Honorary Associate in Malacology, Queen Victoria Museum).

INTRODUCTION:

Some aspects of the distribution and occurrence of Lymnaea tomentosa in Tasmania are given. The danger of the possible introduction of Lymnaea columella is discussed. To assist naturalists recognise the two species brief descriptions are given with references to recent work.

Lymnaea tomentosa (Pfeiffer).

The snail is widely distributed in the north, midlands and south of the state, but not in the north-west or the Huon Valley on present knowledge. Stephens has referred (1975) to its absence from the Huon. Further check may be desirable as L. huonensis Tenison Woods 1876 was named from the Huon. I can find no modern record.

Hubendick (1951) has described the animal fully, but his work is not readily available. The shell has been figured by Kershaw (1975) and Stephens (1975). A great deal of interest has been shown by Philip Munday of Riverside High School near Launceston. The following notes are mainly from snails collected by him from the School dam.

The animal is tan-grey speckled with deep seated white flecks. The foot is very thin broad spatulate posteriorly and distinctly paler than the body. The tentacles are relatively large flat triangular normally resting flat laterally. They may be held erect in young animals. The shell in these is greyish yellow horn with dark mottles and bold longitudinal ribs. Animals collected in early spring to early summer included young but only adults were found by me in June.

ECOLOGY:

L. tomentosa is found at the water's edge in dams often attached to vegetation. It likes the underside of leaves just in the water. Shallow water and marshy areas with clayey mud seem most likely sites. Any salinity seems unsuitable but much remains to be done on the habitat in Tasmania. I am not able to establish any relationship to climate. The significant feature is the presence of persistent moisture throughout the year. Small areas may be all that is necessary to ensure snail survival in dry periods. As the snail is capable of self-fertilisation only a few animals need to survive to reproduce a viable population.

Lymnaea columella Say.

This species has been introduced into New South Wales and Western Australia. Ponder (1975) has discussed the former and Chalmer and Kendrick (1975) the latter situation. The snail has already spread widely after introduction into New Zealand. There is considerable risk that it may reach Tasmania. As it is a more vigorous snail than our present species and a more effective vector of liver fluke, the danger is apparent. The potential effect on the rural industry is emphasised.

Climo and Pullan (1972) give comparisons between the two species. The shell of L. columella is illustrated by both Ponder (l.c.) and Chalmer and Kendrick (l.c.). In general sufficient information is available for tentative identification should the snail reach Tasmania. Provided no delay occurs in identification it may be possible to achieve quick control.

To assist interested naturalists the following points may be made. The shell is more elongate less variable than the rather globose L. tomentosa, but typical of the family. The animal is described as black or very dark grey. The tentacles which are also triangular, are small and tend to point forward when the animal is crawling. Climo and Pullan state that spiral lines are always absent in L. tomentosa though present in L. columella. In Tasmania the former species has very fine spiral lines so this is not a reliable feature.

Snails may be introduced in various ways. One of these is via the stocking of the home aquarium. To facilitate control of exotic species from this source do not empty discarded water into the drainage system. It should be treated with formalin or boiled if there is a risk of entering drains.

PRESERVATION OF FRESHWATER SNAILS:

Menthol is commonly used to relax snails. As it is becoming expensive I have adopted the following method to obtain more effective usage. Prepare a solution of menthol by mixing a dozen or so powdered crystals in about $\frac{1}{2}$ litre clean water. Mix thoroughly. Wash the snails by using a fine mesh kitchen sieve and place in a small jar with some water. As soon as possible, not more than a few hours, fill the jar from the stock solution and secure the top to exclude air. The snails should relax and drown. Within 24 hours drain off the solution into a suitable container and transfer the snails to preservative. The dilute menthol may be re-used once or twice more before discarding. How often I have not yet established.

For permanent preservation fix the snails in neutralised formalin for seven days, then transfer to 70% alcohol. Snails for study use or for sending to a museum can be placed immediately in 70% alcohol after relaxing. After several days they may be forwarded in a sealed container with cotton wool moistened with alcohol. The menthol solution if kept carefully sealed (and labelled) will serve many lots of snails over a period.

The assistance of naturalists in obtaining snails, particularly Lymnaea, for research and monitoring purposes will be greatly valued. Snails may be sent to the Tasmanian Museum. (attent. Mrs. E. Turner), Box 1164 M, P.O. Hobart; to the Queen Victoria Museum (attent. R. Kershaw), Wellington Street, Launceston or to the Chief Veterinary Pathologist, C/- Department Agriculture, Mt. Pleasant Laboratories, P.O. Box 46, South Launceston.

Please supply details of locality where found and method of preservation. Any further details supplied will be valued. Animals may be sent alive if placed in a suitable sealed container with some water and cotton wool or vegetable matter and labelled 'live snails'. Acknowledgement will be made.

ACKNOWLEDGEMENTS:

The writer is grateful for the interest and assistance of Philip Munday and the Headmaster, Mr. Childs of the Riverside High School. The use of a microscope supplied by the Science and Industry Endowment Fund is much appreciated. I am grateful to Department of Agriculture Officers for their help.

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NESTING OF BLACKBIRD

G.S. Dodson

In 1972 a pair of Blackbirds built in a Kunzea baxteri outside the kitchen window, laid 4 eggs, all hatched. They immediately built another nest in a japonica and laid 4 eggs. Two hatched, the other two having been removed by us. As soon as these had flown, the female proceeded to lay 5 eggs in the first nest in the Kunzea, and four of these hatched. The fifth egg was fertile, but the chick did not hatch.

In 1974 the following occurred in the same nest in a bougainvillea.

September	
8 - 11	Laid 4 eggs
	2 eggs removed
25	2 young hatched
October	
9	2 young flew
13 - 17	Laid 5 eggs
	3 eggs removed
31	2 young due but did not hatch.
	Female sat till 5 or 6 Nov., less frequent towards the end.
November	
7 - 11	Laid 5 eggs. There were now 7 eggs in the nest.
22	2 young hatched
25	3rd young hatched
December	
6	1st and 2nd young flew
7	3rd young flew

The 4 eggs left in the nest proved to be infertile.

BIRDS OF THE GRANVILLE HARBOUR DISTRICT

Peter Fielding.

INTRODUCTION

The area considered here is on the west coast of Tasmania, from the Little Henty River to the Newdegate River. Zeehan is the inland limit of the area studied. The habitats generally are typical of the cold-wet western third of the island. : sedgeland, shrub moor, sphagnum bog, wet mallee, wet shrub, wet sclerophyll and mixed Eucalyptus/Nothofagus forests, temperate rainforest, dry Banksia scrub, tall open eucalypt forest and paddocks. The area is mountainous, the highest peak being Mount Agnew, 846m, and there are numerous creeks. The main river is the Little Henty. Cumberland Lake (440m) was dammed to create power for a now disused mine near Trial Harbour. Granville Harbour has an area of rich kraznozem soil which is used for agriculture and contrasts with the poor skeletal soils and moor podzolic peats which surround it.

This is not a complete list for the area - egrets are regular visitors especially along the coast where many seabirds may shelter from storms. Mr. R. Bigwood, a resident of Granville Harbour, kindly supplied much information for that locality and Messrs. K. Fairbrother, J. Faulkner and N. Sheppard also provided valuable information. My observations were made during March, April and October 1975 and March, 1976.

ANNOTATED LIST OF SPECIES:

THICK-BILLED PENGUIN Eudyptes pachyrhynchus
One record of 2 beach-washed birds at Trial Harbour 5 Aug. 1972.

WHITE-CAPPED ALBATROSS Diomedia cauta
4 off Trial Harbour 22 Jul. 1973.

SHORT-TAILED SHEARWATER Puffinus tenuirostris
Recorded at Granville Harbour.

FLUTTERING SHEARWATER P. gavia
One record of a beach-washed bird at Trial Harbour 24 Feb. 1974.

BLACK CORMORANT Phalacrocorax carbo
Common along the coastline. Recorded along the Little Henty River to Zeehan.

LITTLE PIED CORMORANT P. melanoleucos
One at the mouth of Duck Creek.

BLACK-FACED CORMORANT P. fuscescens
Common Granville Harbour. One at St. Clair Falls south of Granville Harbour.

HOARY-HEADED GREBE Podiceps poliocephalus
Recorded at a new dam lined with polythene sheeting at Zeehan.

WHITE-FACED HERON Ardea novaehollandiae
Granville Harbour is a gathering point for birds on winter migration. On 4 Mar. 1975 61 were present. Common between Granville Harbour and Newdegate River 15 Mar. 1976. Small numbers recorded near South Gap Creek, Twelve Mile Creek, Austral Creek, Little Henty River at the mouth and near Zeehan, and at Zeehan Dam.

BLACK DUCK Anas superciliosa
Fairly common Granville Harbour, Zeehan and near the Little Henty mouth.

GREY TEAL A. gibberifrons
Fairly common Granville Harbour.

WHITE GOSHAWK Accipiter novaehollandiae
Pair regular visitors to Granville Harbour until late 1974 since when only a single bird has been seen.

WEDGE-TAILED EAGLE Aquila audax
Occasional at Granville Harbour. Single birds near Trial Harbour, Lake Cumberland and near Piney Creek.

WHITE-BREASTED SEA EAGLE Haliaeetus leucogaster
Fairly common along the coast.

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LICHENS OF SOUTH WEST TASMANIA

PART III FORESTS

G.C. Bratt

THIS note is an extension of the preliminary lichen species listing given in Parts I and II and hence the same limitations, boundaries, definitions and abbreviations apply. The further limitations in this listing arise from the superabundance of lichens in the forested areas which makes it difficult to discern the smaller and less common species. Further material would be appreciated particularly from the forests surrounding mountain tarns, the interiors of the dense "horizontal" forests, and from the remaining "Huon Pine" stands.

The available records show considerable similarity in lichen flora for areas of similar forest type and hence considerable generalization has been made in the species listing of Table 1.

Six forest types and their associated lichen floras or communities are distinguished in Table 1. Types 1 and 2 (Mixed Nothofagus - Eucalyptus and dense Rain Forests) would account for the greatest proportion of the forests in the Southwest and also for the greatest biomass of lichens. The lichen floras of these two types of forest are basically identical although there is a greater variety and a much greater biomass in the dense rain forest. It appears that the lower illumination and perhaps a higher permanent humidity in the dense rain forest areas favours a prolific growth particularly of Pseudocyphellaria sp. and Sticta filix. Most of the species are common and weedy.

TABLE 1 - LICHENS OF THE FOREST OF S.W. TASMANIA

Type 1 Mixed Nothofagus - Eucalyptus Forest

e.g. Logging areas north of Mt. Wedge, West of Mt. Mueller, Arve Rd.

Anzia angustata	Fo, T, 3	Pseudocyphellaria hirta	Fo, T, 3
Cladia aggregata	Fr, T, 2	" pseudosticta	Fo, T, 1
" schizopora	Fr, T, 4	" rubella	Fo, T, 3
Gymnoderma melacarpum	SFr, T, 4	Psoroma sphinctrinum	SFo, T, 2
Menegazzia weindorferi	Fo, T, 2	Sagenidium molle	SFr, T, 4
Nephroma australe	Fo, T, 4	Sphaerophorus melanocarpus	Fr, T, 1
" cellulosum	Fo, T, 2	" tener	Fr, T, 1
Psdueocyphellaria billardieriiFo, T, 1		Sticta filix	Fo, T, 1
" flotowiana	Fo, T, 1	Usnea capillacea	Fr, T, 3

Type 2 Dense Rain Forest - Nothofagus, Anodopetalum, etc.
e.g. South slopes Sentinel Range, Northern slopes Mt. Wedge, Forest Walk Scott's Pk. Rd., Serpentine Dame Rd.

Anzia angustata	Fo, T, 3	Pseudocyphellaria hirta	Fo, T, 2
Collema laeve	Fo, T, 4	" pseudosticta	Fo, T, 1
" leucocarpum (1)	Fo, T, 2	" punctillaris	Fo, T, 4
Dendriscocaulon umhausensis	Fr, T, 4	" rigidula	Fo, T, 4
Hypogymnia lugubris	Fo, T, 2	" rubella	Fo, T, 2
Lecidea cinnabarina	C, T, 3	" scabrosa	Fo, T, 4
Menegazzia weindorferi	Fo, T, 2	Sagenidium molle	SFr, T, 2
Nephroma australe	Fo, T, 4	Siphula decumbens	Fr, T, 2
Pertusaria nothofagii	C, T, 2	Sphaerophorus melanocarpus	Fr, T, 1
Phaeographis dendritica	C, T, 4	" tener	Fr, T, 1
Pilophorus conglomeratum	Fr, T, 4	Sticta filix	Fo, T, 1
Pseudocyphellaria billardierii	Fo, T, 1	Usnea capillacea	Fr, T, 1
" cinnamomea	Fo, S, 1	" xanthopoga	Fr, T, 1
" flotowiana	Fo, T, 1	"	

(1) Exact status presently under investigation. Also known as Polychidium umhausensis

Type 3 Old very mixed forest, Nothofagus, Melaleuca, Dacridium and Banksia
e.g. Lake Judd and Islet Lake

Cladia aggregata	Fr, S, 2	Pseudocyphellaria pseudosticta	Fo, T, 3
Cladina impexa	Fr, S, 4	Psoroma asperellum	SFo, T, 3
Cladoniopsis caespitosa	Fr, R, 4	" sp. (3)	SFo, T, 3
Ephebe fruticosa	SFr, R, 4	" sphinctrinum	SFo, T, 3
Hypogymnia lugubris	Fo, T, 3	Siphula decumbens	Fr, T, 4
Menegazzia bullata	Fo, T, 3	Sphaerophorus melanocarpus	Fr, T, 3
" weindorferi	Fo, T, 3	" tener	Fr, T, 3
Pertusaria sp. (2)	C, S, T, 1	Usnea oncodes	Fr, T, 3
Pseudocyphellaria billardierii	F, T, 3		

(2) Undescribed Tasmanian endemic
(3) Known elsewhere from Tasmania but presently undetermined.

Type 4 Low Melaleuca-Leptospermum Groves
e.g. Banks of Huon beyond Blake's Opening

Anzia angustata	Fo, T, 4	Pseudocyphellaria hirta	Fo, T, 3
Coccocarpia gayana	Fo, T, 2	" pseudosticta	Fo, T, 3
Collema leucocarpum	Fo, T, 3	" rigida	Fo, T, 4
Leptogium brebissonii	Fo, T, 3	" rubella	Fo, T, 2
Nephroma australe	Fo, T, 2	Psoroma contextum	SFo, T, 2
" cellulosum	Fo, T, 1	" durietzii	SFo, T, 2
Parmeliella pycnophora	Fo T, 1	" leprolomum	SFo, T, 2
Peltigera polydactyla	Fo T S, 3	Sticta limbata	Fo, T, 2
Pseudocyphellaria faveolata	Fo, T 2		

Type 5 Isolated Islands of Eucalyptus, Melaleuca, Pittosporum and Phyllocladus in button Grass Plains, e.g. Upper Olga Valley

Leptogium scotinum	Fo, T, 4	Psoroma reticulatum	SFo, T, 4
Pseudocyphellaria billardierii	Fo, T, 3	" soccatum	SFo, T, 2
" colensoi	Fo, T, 4	" sphinctrinum	SFo, T, 2
" flotowiana	Fo, T, 2	Psoromaria descendens	SFo, T, 4
" hirta	Fo, T, 4	Sphaerophorus melanocarpus	Fr, T, 2
" pseudosticta	Fo, T, 2	" tener	Fr, T, 2
" rubella	Fo, T, 2	Sticta filix	Fo, T, 2
Psoroma asperellum	SFo, T, 2	Usnea oncodes	Fr, T, 2

Type 6 Sparse Eucalyptus Forest e.g. Ragged Range Slopes

Anzia angustata	Fo, R, 4	Pseudocyphellaria flotowiana	Fo, T, 4
Coccotrema curcubitula	C, R, 3	" hirta	Fo, R, 4
Hypogymnia lugubris	Fo, R, 2	" pseudosticta	Fo, R, 1
Menegazzia cf albida	Fo, R, 2	" rubella	Fo, T, 4
Peltigera dolichorrhiza	Fo, S, 3	Sphaerophorus tener	Fr, R, 1
Nephroma australe	Fo, R, 4	Sticta filix	Fo, R, 2
Parmelia signifera	Fo, R, 1	Thelidea corrugata	Fo, S, 3
" sinuosa	Fo, R, 4	Usnea sp.	Fr, R, 2
		Xanthoparmelia mougeotiana	SFo, R, 1

Type 3 communities have only been identified at two localities, Lake Judd and Islet Lake, but is expected to occur in unburnt forests fringing the many mountain tarns in the southwest. It appears to be characterised by a small lichen population both in number and abundance of species. A curiosity is the recently discovered and as yet undescribed Tasmanian endemic Pertusaria species (known only from the two area mentioned above) in which the spores are sufficiently large to be seen with the unaided eye when they burst from the fruiting body in a jelly like mass.

Type 4 forests (mixed groves of Leptospermum and Melaleuca) are common around the rivers of the southwest, but the particular community of lichens and forest type has only been located once in the Huon Valley. All of the species listed for this community are known from other parts of the State, but in no other area so far examined has there been such a rich assemblage of normally rare species particularly Coccocarpia gayana and Parmeliella pycnophora.

The isolated islands of trees in button grass plains (Type 5) and the open Eucalyptus stands (Type 6) were expected to have floras similar to those button grass areas described in Part I of this series, but appear to have rather unusual lichen floras maybe as a result of the existence of two rather unusual substrates. In Type 5 forests Psoromaria descendens was found on Melaleuca squamea and this is the first record of this species for Tasmania and Australia. In Type 6 forests the occurrences of two Xanthoparmelia species, X. mougeotiana and X. sinuosa on Quartz conglomerate are considered unusual.

There are quite likely other communities which have not yet been described in any of the three parts of the present series and further work is obviously desirable at the earliest opportunity.

Three anthropological effects may alter the existing lichen flora - flooding, timber cutting and fires (controlled or wild). Flooding may destroy some of the dense rain forest areas in the river valleys but investigation to date shows that the loss would be of common (in other parts of the State) weedy species. Loss of "Huon Pine" Stands may be more serious as these have not yet been examined. Timber cutting in the area will increase illumination and hence temporarily destroy shaded habitats causing Type 2 communities to temporarily degenerate into Type 1 communities. Fires in such areas will have disastrous temporary effects. However, because of the high rainfall in the area regeneration after cutting and fires is expected to be rapid and the communities would be expected to be restored in a reasonable time provided unburnt pockets remain to supply lichen propagules. Fires from unextinguished camp fires near mountain tarns are likely to be particularly destructive of Type 3 communities which may require centuries to regenerate.

BIRDS OF THE GRANVILLE HARBOUR DISTRICT

Peter Fielding

CONTINUED - from August

SWAMP HARRIER	Circus approximans Single birds seen at Granville Harbour and Zeehan.
BROWN FALCON	Falco berigora Fairly common Granville Harbour. One at Zeehan.
BROWN QUAIL	Synoicus ypsilophorus Fairly common at Granville Harbour and present at Trial Harbour and Zeehan.
TASMANIAN NATIVE HEN	Tribonyx mortierii Has become established at Granville Harbour over the last five years spreading down the coast from the Pieman River mouth. Occasional at Fen Creek near the Little Henty River mouth.
PIED OYSTERCATCHER	Haematopus ostralegus Small numbers at Granville Harbour, the mouth of the Little Henty River and George Town Packet Creek.
SPUR-WINGED PLOVER	Vanellus miles Common Granville Harvour to Hoyle Creek. Also recorded at Zeehan.
BANDED PLOVER	V. tricolor Present at Granville Harbour.
RED-CAPPED DOTTEREL	Charadrius alexandrinus Two at the Little Henty River mouth in Mar. 1976.
JAPANESE SNIPE	Gallinago hardwickii Occasional visitor to Granville Harbour and Zeehan.

PACIFIC GULL Larus pacificus Recorded at the Little Henty River mouth, Trial and Granville Harbours.

SILVER GULL L. novaehollandiae Common along the coast.

CRESTED TERN Sterna bergii Common Granville and Trial Harbours. Also recorded near the mouth of the Little Henty River.

BRUSH BRONZEWING Phaps elegans Common in a variety of habitats including gorse, scrub, bracken and forest.

YELLOW-TAILED BLACK COCKATOO Calyptorhynchus funereus Common Granville Harbour. Flock at the Little Henty River near Zeehan.

GREEN ROSELLA Platycercus caledonicus Common and widespread in a variety of wooded habitats, occasionally in paddocks.

GROUND PARROT Pezoporus wallicus One near Big Rocky Creek, 2 near Granite Creek and one at Zeehan Dam.

FAN-TAILED CUCKOO Cacomantis pyrrhophanus Recorded at Zeehan

BOOBOOK OWL Nixox novaeseelandiae Recorded at Granville Harbour and the Little Henty River 12 km south of Zeehan.

SPINE-TAILED SWIFT Hirundapus caudacutus Common and widespread during March.

WELCOME SWALLOW Hirundo neoxena Common and widespread in light vegetation, on beaches and along waterways.

TREE-MARTIN Petrochelidon nigricans Less common than the previous species. Found in similar habitats and in lightly wooded areas.

AUSTRALIAN PIPIT Anthus novaeseelandiae Common and widespread in button grass.

BLACK-FACED CUCKOO-SHRIKE Coracina novaehollandiae Recorded at Granville Harbour and near Piney Creek.

AUSTRALIAN GROUND-THRUSH Zoothera dauma Seen in rainforest east of Mt. Heemskirk.

BLACKBIRD Turdus merula Common at Granville Harbour. Present at Zeehan and seen in mixed forest near Zeehan.

SUPERB BLUE WREN Malurus cyaneus Common in a variety of habitats.

SOUTHERN EMU-WREN Stipiturus malachurus Common in sedgeland and habitats with low shrubs.

TASMANIAN THORNBILL Acanthiza ewingi Common in timbered areas from dense forest to scattered low trees and shrubs in sedgeland.

BROWN SCRUB-WREN Sericornis humilis Common in dense low vegetation.

FIELD-WREN Calamanthus fuliginosus Common in areas with low vegetation.

WHITE-FRONTED CHAT Epthianura albifrons One male on a marshy headland near Granville Harbour.

SCARLET ROBIN Petroica multicolor Recorded at Granville Harbour.

FLAME ROBIN P. phoenicia Recorded at Zeehan, Granville Harbour and between the Heemskirk River and Stoney Creek.

DUSKY ROBIN P. vittata Common in a variety of habitats ranging from forest to sedgeland.

GREY FANTAIL Rhipidura fuliginosa Common in most habitats with trees.

GOLDEN WHISTLER Pachycephala pectoralis Single birds at Granville Harbour and near Piney Creek.

OLIVE WHISTLER P. olivacea Present at Granville Harbour. Single birds seen near Zeehan, near Piney Creek and in gorse near the Little Henty River.

GREY SHRIKE-THRUSH Colluricincla harmonica Common in most forest and scrub habitats.

GREY-BREASTED SILVEREYE Zosterops lateralis Recorded at Trial and Granville Harbours.

YELLOW-THROATED HONEYEATER Meliphaga flavicollis Common in forest and scrub.

STRONG-BILLED HONEYEATER Melithreptus validirostris Small flocks seen at Trial Harbour and along the Granville Harbour road.

CRESCENT HONEYEATER Phylidonyris pyrrhoptera Common and widespread in a wide variety of habitats ranging from dense forest to patches of scrub in sedgeland.

NEW HOLLAND HONEYEATER P. novaehollandiae Common in flowering Banksia scrub at Trial and Granville Harbour.

TAWNY-CROWNED HONEYEATER Gliciphila melanops Fairly common in gardens and coastal scrub at Granville Harbour.

EASTERN SPINEBILL Acanthorhynchus tenuirostris Common between Hoyle Creek and Zeehan in March. Also recorded at Trial Harbour.

BEAUTIFUL FIRETAIL Emblema bella Common in a variety of habitats ranging from forest to sedgeland.

HOUSE SPARROW Passer domesticus Common Granville Harbour and Zeehan.

GOLFINCH Carduelis carduelis Fairly common in forest and scrub.

GREENFINCH Chloris chloris Seen in coastal scrub near Granville Harbour.

STARLING Sturnus vulgaris Common Granville Harbour, Trial Harbour and Zeehan. Also recorded along coast in uninhabited areas.

BLACK CURRAWONG Strepera fuliginosa Common in a variety of habitats.

FOREST RAVEN Corvus tasmanicus Common and widespread, ranging from dense forest to beaches. Most of the beach flocks in Mar. 1976 were of immature birds.

WHITEBAIT

P. Andrews

THE name "whitebait" is the term almost universally applied to the small slender transparent fishes which migrate seasonally in large shoals up rivers and estuaries where they are caught and used as food. In some instances whitebait consists of the juvenile stages of a number of fairly common marine species. European whitebait, for example, consists of a mixture of herrings, sprats, gobies etc., whereas the whitebait of Australia and New Zealand consists predominantly of a single species.

The large commercial whitebait fishery of New Zealand is based entirely on fishes of the family Galaxiidae, commonly known as jollytails or native trout, which is a group of small freshwater fishes found only in the southern hemisphere. The common jollytail Galaxias maculatus (Jenyns) forms the main bulk of the New Zealand whitebait catch although McDowall (1) has found that other galaxiid species are often present in considerable numbers.

The Tasmanian whitebait fishery, like that of New Zealand, is also based on a single species only in this case it is a small endemic species known as the Derwent Smelt or Whitebait, Lovettia sealii (Johnston). This small fish is a member of the family Aplochitonidae, which also includes the grayling, Prototroctes maraena Gunther, and is very closely related to both the Galaxiidae and the Retroponnidae (smelts). Fishes of the family Galaxiidae also occur widely in Tasmania but only rarely do they appear in whitebait catches.

The Tasmanian whitebait is a small species which grows to about 50 mm in length and is entirely restricted to the Tasmanian mainland. Although it has been recorded from the lower reaches of most Tasmanian rivers only in a few does it occur in commercial quantities. These are mainly the rivers of the north from Bridport west to Smithton and a few southern rivers principally the Huon, Esperance and Derwent.

The species has an unusual life cycle. The eggs are laid during the spring months on sticks, weed, rocks etc. in the spawning areas which are located in the upper reaches of the estuaries. Hatching takes place between 15 and 20 days later and the larvae are washed out to sea where they grow to maturity, returning the following spring to migrate back up the rivers. The fish are caught commercially during this period by placing suitable nets in the path of the long ribbon-like shoals as they more up towards the spawning areas. After spawning the life cycle has been completed and almost all the spent fish die.

Although it is classified as a freshwater species Lovettia sealii spends most of its growing life in the sea. This is a distinct advantage in a freshwater species as it enables the growing larvae to exploit the rich plankton fauna of the sea rather than having to depend on the less abundant and less reliable food reserves of freshwater areas.

The Tasmanian whitebait fishery dates from the early 1940's when a local firm began canning operations. From 1941 to 1950 the annual catch rose rapidly, reaching a peak during 1949/1950. Part of this rapid growth was undoubtedly due to the fact that the fishery provided valuable employment during the post war years for the fishing and canning industries, the more so in view of the fact that it was available when most other species were not. In addition the ready market and the relative ease of catching the fish without the need of specialised equipment probably attracted more people into the fishery. From the 1950's onwards, however, both the species and the fishery have shown a marked and steady decline until it has reached the point today where commercial operations have all but ceased and the fishery has been closed by law.

The reasons for this decline appear to be directly attributable to a combination of overfishing and the fact that the species is harvested during the most vulnerable and undesirable part of the life cycle from the viewpoint of reproduction. Whereas the New Zealand whitebait are harvested as juveniles migrating upstream to grow into adults, Lovettia sealii in Tasmania is harvested as mature adults before they can carry out their first and only spawning. Thus not only are the migrating fish taken but their reproductive potential, which provides the next generation, is destroyed. Survival of the species thus depends on those fish which can evade capture and spawn successfully.

Although the whitebait fishery has now been closed as a conservation measure it does not necessarily mean that Lovettia sealii itself is an endangered species. The biology has been thoroughly studied by Blackburn (2) who concluded that the fishery could recover if it was severely restricted for a time to allow the numbers to build up, followed by a management plan to prevent overfishing. Despite these recommendations, made over twenty years ago, it still seems that in many areas the fishery is being overexploited resulting in the closure over the last few years. It may be some years yet before Lovettia sealii finds its way back into the fish shops as a table delicacy.

(1) McDOWALL, R.M. 1964 A consideration of the question "What are Whitebait?". Tuatara 12 (3) : 134 - 146.

(2) BLACKBURN, M. 1950. The Tasmanian whitebait, Lovettia sealii (Johnston) and the whitebait fishery. Aust. Jour. Mar. Freshwat. Res. 1 (2) : 155-198

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PUFFINUS HUTTONI ON TASMANIA'S EAST COAST

R.M. Tyson and C.R. White

DURING the first three months of 1975, six Shearwater specimens were collected between Diana's Basin and Peron Dunes. These specimens included one fresh, one desiccated and four skulls, and they are numbered as follows and will be referred to by the numbers in the following article.

Fresh (skin)	2/8
Desiccated	5/5
Skulls	4/22, 4/23, 4/24, 4/25

All specimens were initially thought to be Puffinus gavia. On further examination, and consultation with Mr. W.B. Hitchcock, specimen numbers 5/5, 4/23, 4/24 and 4/25 were found to be P. huttoni.

Comparing bill sizes and shapes to diagrams presented by Slater (1970) there is no doubt that these specimens are P. huttoni. Furthermore on taking measurements from the end nares (nearest to the tip of bill) to the tip of the maxillary unguis the following results were obtained.

Specimen Number	Measurement (mm)
4/22	23.5
2/8	24.0
4/23	26.0
4/24	26.5
4/25	26.0
5/5	27.0

According to The Handbook of Australian Sea-Birds (Serventy et al 1971) the average of the culmen of P. huttoni is greater than that of P. gavia. It is therefore concluded that due to the differences between specimen numbers 4/22 and 2/8 and specimen numbers 4/23, 4/24 and 5/5 that the latter must be P. huttoni.

From these observations and discussion with Mr. R.H. Green, specimens at the Queen Victoria Museum have subsequently been identified as follows.

Registered Number	Species
1969/2/103	P. gavia
1970/2/17	P. gavia
1973/2/75	P. huttoni
1974/2/29	P. huttoni
1976/2/1	P. huttoni

Previous records show that P. huttoni has not been recorded in this State. However, the above results show that in two collections P. huttoni is more common than P. gavia.

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Serventy, D.L., Serventy, V.N., Warham, J. 1971: The Handbook of Australian Sea-Birds.

Slater, P. 1970: A Field Guide to Australian Birds Non Passerines. P193.

CHANGES IN THE AVIFAUNA OF HOBART

Peter Fielding

INTRODUCTION

Times have changed since 1838 when naturalist John Gould started his Australian field work in the streets of Hobart Town. Gould frequently observed flocks of between four and twenty Swift Parrots Lathamus discolor passing over the town. Other species found in Hobart Town are mentioned by Gould in his Handbook to the Birds of Australia. The species mentioned were Welcome Swallow Hirundo neoxena, Tree Martin Petrochelidon nigricans, Tasmanian Thornbill Acanthiza ewingii, Flame Robin Petrocia phoenicea, Dusky Robin P. vittata, Yellow-tipped Pardalote Pardalotus striatus, Grey-breasted Silvereye Zosterops lateralis and Yellow Wattle-bird Anthochaera paradoxa. Undoubtedly Gould observed other species in Hobart Town but unfortunately didn't list them. Hobart Town in 1838 consisted of low buildings trees and shrubs. Now Hobart Town has grown to a city of tall buildings with little vegetation.

Between April 1974 and December 1976 I made a study of one city block in the main business centre. The study block was bounded by Collins, Elizabeth, Macquarie and Argyle Streets. Observations were made from ground level and from various floors of the fourteen storey high Australian Mutual Provident Society building on the corner of Collins and Elizabeth Streets. Some vegetation can be found in small gardens located in courtyards on rooftops and in front of the A.M.P. building. My thanks to Mr. L.E. Wall who provided some valuable information.

ANNOTATED LIST OF SPECIES

White-faced Heron Ardea novaehollandiae. A single bird observed flying above the A.M.P. Building 17 May 1976.

Silver Gull Larus novaehollandiae. Common. Many birds observed daily flying overhead and perched on ledges of buildings etc.

Domestic Pigeon Columba livia. Common. Often observed perched on the Clock Tower of the G.P.O.

Spotted Turtle Dove Streptopelia chinensis. One record of a bird flying above Argyle Street on 15 May 1975.

Swift Parrot Lathamus discolor. Two birds rooftop level 27 December 1976. Gould found this species common in 1838.

Yellow-tailed Black Cockatoo Calyptorhynchus funereus. Three birds slowly flying at rooftop level 28 August 1976 was the only record.

Budgerigar Melopsittacus undulatus. One record of an aviary escapee in the A. M. P. garden possibly after seeds on the ground 25 March 1976.

Spine-tailed Swift Hirundapus caudacutus. Occasionally observed flying above the city between February and April.

Welcome Swallow Hirundo neoxena. One or two birds occasionally observed flying above streets and buildings.between September and March. This species once regularly nested in the old A. M. P. building which was demolished during 1967. No nests have been found in the new building which was built on the old site. Gould found this and the following species common in 1838.

Tree Martin Petrochelidon nigricans. Occasional birds observed flying above streets and buildings between September and March. M. Sharland (Tasmanian Birds 1958) believes that nests are built occasionally in ventilators on buildings.

Blackbird Turdus merula. Common, with an increase in numbers during the wet winter of 1975. Occasional birds observed in the A. M. P. front garden.

Satin Flycatcher Myiagra cyancleuca. One record of a dead female bird that was found on the third floor podium roof of the A. M. P. building early April 1975.

House Sparrow Passer domesticus. Common, regularly observed in the A. M. P. front garden.

Goldfinch Carduelis carduelis. Two birds occasionally observed on the podium roof and in the A. M. P. garden. A pair of birds successfully nested across the road from the study block on the A. N. Z. Bank corner in Elizabeth Street. The nest was located in an ornamental tree beside the banks main entrance. Food for the young was mostly obtained from the A. M. P. garden.

Starling Sturnus vulgaris. Common throughout the day with large flocks gathering at dusk and roosting on building ledges etc. One bird was observed carrying nesting material to a tall neon sign, September 1974. A dead freshly hatched chick and an egg with a nearly hatched chick, was found on the A. M. P. poduim roof 30 Oct. 1975.

Forest Raven Corvus tasmanicus. Common, with one or two birds observed flying at roof top level daily.

CONCLUSION :

Sixteen species of birds were found, ten of them native. Only two native species are regular year round inhabitants. Three native species are regular migrants. The other five native species were only observed once. All except two of the introduced species are common. The number of introduced birds are far greater than native species. No introduced birds were recorded by Gould in 1838.

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THE PREY OF A NATIVE CAT IN SOUTH-WEST TASMANIA

by
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THE use of predator scat analysis in mammal surveys has become more popular in Australia since the publication of Brunner and Coman (1974). The technique involves identifying mammalian hairs (as well as examining bones, teeth and claws) using keys in the above book. Subsequently, the results of some surveys have been published which highlight the advantages of scat analysis over the conventional survey techniques of trapping, direct observation and spotlighting. (Brunner, Lloyd and Coman, 1975; Brunner, Amor and Stevens, 1976). These latter authors list these advantages as :-

(i) more species are often detected;
(ii) field collection is rapid;
(iii) the scats can be stored and processed at a convenient time.

During May, 1976 some mammalian scats were found in a buttongrass (Gymnoschoenus sphaerocephalus) community at the start of the old Lake Pedder walking track by the Strathgordon road. Three sets of scats of different ages were found lying side by side and are thought to be either of a quoll (Dasyurus viverrinus) or tiger cat (Dasyurus maculatus). Although the habitat may be more suitable for the quoll, the large size of the scats could indicate they belong to the tiger cat. One of the scats contained a lower jaw bone of the broad-toothed rat (Mastacomys fuscus), while the others contained fur of a pigmy possum (Cercartetus nanus or C. lepidus). M. fuscus is generally regarded as a difficult mammal to trap when living sympatrically with other small mammals (Reed and Wallis, 1975). However, use of predator scat analysis in a forest park in Victoria has shown this species to be much more common than was previously supposed (Brunner and Bertuch, 1976). Finally, data from such analyses provides some information (albeit limited) on the ecology of the predator and prey species so concerned.

Acknowledgements

We would like to thank Mr. R. H. Green for information on the Dasyurus spp. and Mr. H. Brunner for assistance with the scat analysis.

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BIOGRAPHICAL DATA:

In the course of preparing A Bio-bibliography of Australian Ornithology : 1951-1975, I am gathering a great deal of biographical data on many of the people who, in numerous ways, have contributed to Australian ornithology.

I am happy to report that people are already drawing on this material for a variety of purposes, and I would like to advise that the information is available should it be required.

SPOONBILLS IN TASMANIA

L. E. Wall

Royal Spoonbill (Platalea regia).

The first record for Tasmania was of a pair at Brown's River, just south of Hobart, on 5 May 1957 and they were there for two weeks before moving on. This was recorded in "The Emu" 57 p. 234 by M. Sharland, with a footnote that nine more had been seen at Little Swanport on the East Coast but no date was given.

On 31 August 1957 P. Bolger found one at Stanley and another at Forth. Early in October 1957 two re-appeared at Brown's River but stayed only a few days. I photographed them on 6 October.

The nine birds at Little Swanport were seen by me on 4 November 1957 and on 4 April 1958, and by P. Bolger on 23 November 1957 and 16 March 1958.

At Swansea a single bird appeared at "The Bend" on 2 September 1959 and I saw it there two days later. S. Stanfield, living on the property told me that one or two had appeared regularly at intervals of some months during the past three years, and Mrs. Lyne, of the neighbouring property "Riversdale", also saw two of them for a couple of months in 1957.

From 1959 no reports were received until 2 July 1966 when M. McGarvie saw one at Pass River, King Island (see Tas. Naturalist No. 7). The only recent occurrence was recorded in Tas. Bird Report No. 5, when two were seen at Golden Fleece Sanctuary, St. Helens from 8 to 11 September 1975.

Yellow-billed Spoonbill (Platalea flavipes)

King Island has produced the first records for the State of Tasmania, one in June 1965 near Cape Wickham where it remained for a couple of months, two at Bungaree Swamp in May 1972, and one at Yellow Rock River in July 1972. In 1975 the first report came to me verbally from Mr. and Mrs. J. Cole of Swan Point on the Tamar River, and this was confirmed by R. Cooper (see Tas. Bird Report No. 5). Mr. Cole also told me that he had seen one at St. Helens on 27 October 1972.

On 11 August 1975 H. Hale told me by phone that Mrs. W. Don, of "Coswell" Swansea, had a Yellow-billed Spoonbill about their property. I called there on 9 September but was unable to find it although I was assured it was still in the neighbourhood. I have no doubt about the identification of these records.

THE THIRD SIGHT RECORD OF THE BLACK-TAILED GODWIT IN TASMANIA

O. M. G. Newman

THIS note concerns a sight record of the Black-tailed Godwit Limosa limosa at Orielton Lagoon near Sorell on 28 February, 1976, during the Hobart area annual

wader count made by the Bird Observer's Association of Tasmania. The tide was high and the weather fine and bright with no wind.

A large number of waders was resting on an island in Orielton Lagoon. On wading out to the island, I flushed a large flock (c. 90) of Bar-tailed Godwits L. lapponica, which flew off towards the Sorell tip. However, two godwit-sized birds returned to the island and settled among a flock of c. 200 Curlew Sandpipers Calidris ferruginea. One of the godwit-sized birds had a wide white central bar on the upper wing, and a long straight bill.

I viewed the resting birds through 10 x 50 binoculars for approximately 5 minutes at a distance of 50 m. Three godwit-type birds, obviously much larger than the Curlew Sandpipers were present. I could not distinguish between these three birds which each had long straight bicoloured bills. On closer approach the three godwits flushed before the Curlew Sandpipers. Only one of the godwits had any wing or tail bars. This bird had a wide white central wing bar and a broad white band above a black terminal tail band. (These field characters were noted by other more distant observers).

On the basis of the above field characters I have no doubt that the bird with the white wing and tail bars was a Black-tailed Godwit Limosa limosa, the only possible confusing species being the Hudsonian Godwit L. haemastica, which has an indistinct white upper wing bar.

My previous experience of the Black-tailed Godwit has been limited (2 observations), but very recent. On the previous weekend I visited the I.C.I. salt fields at St. Kilda, Adelaide, with two local ornithologists, Drs. R. Sothman and J. Hatch, and saw a flock of 35 Black-tailed Godwits in flight. The Black-tailed Godwit is much commoner than the Bar-tailed Godwit at the St. Kilda salt fields, the converse of the situation in the Hobart area.

The two previous Tasmanian records of the Black-tailed Godwit were also made in the Hobart area, at Ralphs Bay on 28th January, 1965, (Thomas 1966) and at Sorell on 19th November, 1966, (Anon. 1968).

Anon Tas. Nat. 12 (1968)
Thomas, D.G. Emu 65, 222 (1966)

A CHECKLIST OF THE BIRDS OF MOUNT FIELD NATIONAL PARK

	Common Name	Scientific Name	Status	Habitat
1.	Black cormorant	Phalacrocorax carbo	o	1
2.	White-faced heron	Ardea novaehollandiae	o	1
3.	Black duck	Anas superciliosa	o	1
4.	Grey goshawk	Accipiter novaehollandiae	o	2,3
5.	Australian goshawk	Accipiter fasciatus	u	2,3
6.	Wedge-tailed eagle	Aquila audax	u	4,5
7.	Swamp harrier (2)	Circus approximans	o	2
8.	Lewin water rail	Rallus pectoralis	u	1
9.	Tasmanian native hen (1)	Tribonyx mortierii	c	2
10	Spurwinged plover	Vanellus milos	c	2
11.	Brush bronzewing	Phaps elegans	c	3
12.	Swift Parrot (3)	Lathamus discolor	o	2

	Common Name	Scientific Name	Status	Habitat
13.	Yellow-tailed black cockatoo	Calyptorhynchus funereus	c	3,4
14.	Sulphur-crested cockatoo	Cacatua galerita	o	3
15.	Green rosella (1)	Platycerus caledonicus	vc	3,4,5
16.	Pallid cuckoo	Cuculus pallidus	o	2
17.	Fan-tailed cuckoo	Cacomantis pyrrhophanus	u	3
18.	Golden Bronze cuckoo (2)	Chrysococcyx plagosus	u	3
19.	Superb lyrebird	Menura novaehollandiae	c	3
20.	Welcome swallow (2)	Hirundo neoxena	c	1,2
21.	Tree martin (2)	Petrochelidon nigricans	u	2
22.	Pipit	Anthus novaeseelandiae	c	5 (2)
23.	Black-faced cuckoo-shrike	Coracina novaehollandiae	o	2,4
24.	Ground thrush	Zoothera dauma	c	3
25.	Blackbird	Turdus merula	u	2
26.	Superb blue wren	Malurus cyaneus	c	2
27.	Tasmanian thornbill (1)	Acanthiza ewingi	vc	3,4,5
28.	Yellow-rumped thornbill	Acanthiza chrysorrhoa	o	2
29.	Scrub tit (1)	Acanthornis magnus	vc	3,4,5(1)
30.	Brown scrub wren	Sericornis humilis	vc	3,4,5
31.	Scarlet robin	Petroica multicolor	u	2
32.	Flame robin	Petroica phoenicea	c	2,3,4,5
33.	Pink robin	Petroica rodinogaster	c	3,4
34.	Dusky robin (1)	Petroica vittata	u	2,4
35.	Grey fantail	Rhipidura fuliginosa	vc	3,4,5
36.	Satin flycatcher (2)	Myiagra cyanoleuca	u	3
37.	Golden whistler	Pachycephala pectoralis	c	2,4
38.	Olive whistler	Pachycephala olivacea	c	3
39.	Grey shrike-thrush	Colluricincla harmonica	c	3,4
40.	Spotted pardalote	Pardalotus punctatus	c	3,4
41.	Yellow tipped pardalote (3)	Pardalotus striatus	u	4
42.	Grey-breasted silvereye	Zosterops lateralis	c	3,4
43.	Yellow-throated honeyeater (1)	Meliphaga flavicollis	c	3,4,5
44.	Black-headed honeyeater (1)	Melithreptus affinis	u	3,4
45.	Strong-billed honeyeater (1)	Melithreptus validirostris	c	3,4
46.	Crescent honeyeater	Phylidonyris pyrrhoptera	vc	3,4,5
47.	Eastern spinebill	Acanthorhynchus tenuirostris	u	4
48.	Yellow wattlebird	Anthochaera paradoxa	u	3,4
49.	House sparrow	Passer domesticus	c	2
50.	Black currawong	Strepera fuliginosa	vc	2,3,4,5
51.	Clinking currawong	Strepera arguta	o	3
52.	Forest Raven	Corvus tasmanicus	c	5,4,5

(1) Tasmanian endemic species (2) Summer visitor

(3) A summer visitor confined to Tasmania

Status o - occasional u - uncommon

c - common vc - very common

Habitats
1 - water - streams, River Tyenna, lakes & tarns
2 - cleared land (around picnic area & caravan park)
3 - rainforest (shown as heavy timber on Mt. Field National Park map)
4 - sub-alpine forest (shown as light timber on Mt. Field National Park map).
5 - moors & sedgelands.

This checklist has been compiled by the Bird Observers' Association of Tasmania. While every effort has been made to ensure that the list is as accurate as possible it is not claimed to be complete. If you have any additional information it would be appreciated if you would contact: The Secretary
Bird Observers' Association of Tasmania,
G.P.O. Box 68A, HOBART ... TAS. 7001

NOTES ON THE DISTRIBUTION OF ENDEMIC PLANTS

A. Moscal

The following list of endemic plants of Tasmania, compiled on bushwalking trips from 25-12-'75 to 1-3-'76.

LYELL HIGHWAY TO TULLAH

Epilobium perpusillum: Banks of Collingwood River.
Richea scoparia, Richea milliganii, Richea curtisae, Richea pandanifolia; Rocky Hill, High Dome, Eldon Bluff, Eldon Range and Peak.
Diplaspis cordifolia: Rocky Hill Plateau, Eldon Bluff, Eldon Peak.
Milligania densiflora: Rocky Hill (Eastern Rock ledges) Eldon Range.
Milligania lindloniana: Eldon Bluff Plateau, abundant, I regard it as the main stronghold of this plant within the state.
Dichosciaduim ranunculaceum var tasmanicum: Eldon Bluff.
Aciphylla precumbens: Eldon Peak, abundant, growing in prostrate cushion formation.
Abrotanella forsterioides: Eldon Peak, Eldon Range north Bluff Plateau.
Trochocarpa cunninghammii: Southwest of High Dome.
Olearia pinifolia, Perneitya tasmanica, Orites milliganii, Ewartia meridithae, Pterostylis dubia: Rocky Hill.
Athrotaxis cupressoides: Rocky Hill eastern lower Plateau, Lake Ewart.
Anemone crassifolia: Rocky Hill, High Dome, Eldon Range, Eldon Bluff.
Spyridium gunnii: Common at the base of north-eastern cliffs.

FROM ELDON RANGE NORTHWARDS ALONG THE CREST OF UNNAMED RANGE TO THE MURCHISON RIVER FOUR KM. EAST OF WHITE CLIFF HILLS

Abrotanella forstiroides, Campinema lineare, Epacris mucronulata, Agastachy odorata, Nothofagus gunnii, Tetracarpaea tasmanica, Olearia pesonoides, Persoonia gunnii, Anemone crassifolia, Helichrysum pumilum, Helichrysum antennarium, Leptomeria glomerata, Euphrasia diemenica, Euphrasia striata, Cyathodes petiolaris, Baeckia leptocaulis, Leptospermum rupestre, Rubus gunianus, Acaena montana, Eriostemon virgatus, Blandifordia punicea, Isophysis tasmanica, Eucalyptus vernicosa, Fucalyptus coccifera, Erigeron stellatus, Xyris operculata.

(Cont'd.)

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NOTES ON THE DISTRIBUTION OF ENDEMIC PLANTS

A. Moscal

(Continued - the first part of this article appeared in The Tasmanian Naturalist No. 48, February 1977)

MURCHISON RIVER

Lomatia tinctoria, Lomatia polymorpha, Epacris mucronulata, Cenarrhenes nitida, Anopterus glandulosus, Anodopetalum biglandulosum, Eucryphia lucida, Phyllocladus asplenifolius.

THE GOOSENECK, MT. MURCHISON, MT. READ, MT. HAMILTON

Phyllocladus asplenifolius: South of Lake Johnston.
Microcachrys tetragona, Diselma archeri: South-east ridges of Mt. Murchison.
Athrotaxis selaginoides: Mt. Read, Mt. Murchison at Lake Sandra, Lake Gaye.
Anemone crassifolia: Throughout
Aristotelia peduncularis: In forest West of the Gooseneck (Berry - White variant only.)
Rubus gunnianus: Mt. Murchison, abundance of fruit set only within disturbed soil, in mining and erosion areas, the same observation applies also to observations in the Loddon Range.
Anodopetalum biglandulosum: Intermixed with *Nothofagus gunnii,* South of Lake Johnston at 840 m level.
Anopterus glandulosus, Eucryphia lucida: Rain-forest West of the Gooseneck.
Callistemon viridiflorus: Mt. Murchison South.
Diplaspis cordifolia, Dichosciadum ranunculaceum var, tasmanicum, Eucalyptus vernicosa, Pernettya lanceolata, Gautheria hispida, Monotoca empetrifolia, Epacris mucronulata, Ourisia integrifolia, Euphrasia striata, Euphrasia hookeri, Plantago gunnii, Agastachys odorata, Orites milliganii, Pimelea milliganii, Exocarpos humifusus, Leptomeria glomerata, Poa gunnii, Campinema lineare: Mt. Murchison.
Persoonia gunnii: Red blossoms, probably diseased, Lake Sandra.
Euphrasia diemenica, Euphrasia diemenica collina variant: The Gooseneck and Noran Saddle.
Richea milliganii: Most predominant shrub and main stronghold of this plant localized on an area of 500 x 200 m at 960 m level West of Lake Sandra.
Richea angustifolia: Mt. Murchison confined only to exposed ridges.
Lomatia polymorpha: Rain-forest West of Mt. Murchison.

Pimelea lindleyana: Rain-forest throughout the range.
Richea curtisae: Ring River unburned area on plateau between Mt. Read and Mt. Hamilton.
Actinotus moorei, Cyathodes petiolaris, Trochocarpa cunninghamii, Leucopogon milliganii, Archeria serpillifolia, Richea scoparia, Richea pandanifolia, Prionotes cerinthoides, Mitrasacme archeri, Cenarrhenes nitida, Milligania densiflora, Blandfordia punicea: Throughout the Range from Mt. Hamilton to Mt. Murchison.

ARTHUR PLAINS

Dacrydium franklinii: Junction Creek.
Lomatia polymorpha, Monotoca scoparia var, submutica: Junction Creek and Wullyawa Creek.
Pterostylis vereenae: Not endemic, Wullyawa Creek abundant.
Thelymitra truncata: Not endemic, Dorado Ridge at 360m level.
Haemodorum distichophyllum: Crossing River - Spring River Divide.

CROSSING RIVER GORGES

Dracophyllum milliganii, Dacrydium franklinii, Lomatia polymorpha, Isophysis tasmanica, Blandfordia punicea, Monotoca scorparia var. *Leptospermum glaucescens:* On islands North of Davey S.L. Unburned sanctuaries, trees up to 15m high.

GREYSTONE BLUFF

Geum talbotianum: 20 Plants only, confined in a single cleft West side of the main Bluff rock base at 960m level.
Diselma archeri, Microcachrys tetragona, Athrotaxis selaginoides Anemone Crassifolia, Anodopetalum biglandulosum, Anoptcrus glandulosus, Tetracarpaea tasmanica, Eucryphia milliganii, Baeckea leptocaulis, Leptospermum rupestre, Milligania stylosa, Diplaspis cordifolia, Ewartia meridithea, Senecio pectinatus var. *ochroleuca, Forstera bellidifolia, Cyathodes parvifolia, Monotoca glauca, Epacris corymbiflora, Dichosciadium ranunculaceum* var. *tasmanicum, Olearia persoonioides, Olearia ledifolia Ewartia meridithae, Archeria hirtella, Archeria eriocarpa, Archeria serpyllifolia, Prionotes cerinthoides, Sprengelia distichophylla, Richea milliganii, Richea curtisae, Richea scoparia, Richea pandanifolia, Dracophyllum milliganii, Dracophyllum minimum, Euphrasia diemenica, Euphrasia kingii, Euphrasia hookeri, Agastachys odorata, Cenarrhenes nitida, Persoonia gunnii, Orites milliganii, Pimelea lindleyana, Pimelea milliganii, Helichrysum pumilum, Isophysis tasmanica, Blandfordia punicea, Xyris operulata, Eucalyptus vernicosa.*

DAVEY RIVER PLAINS

Milligania johnstonii: Two localities South of Badger Creek, at between 40 and 80m elevation.
Location I in wet heath 25 x 100m
Location II in wet heath and quarzite sand deposit of overflowing perennial creek, 100 x 250m.
Old River Sheet 8111/199263 and 199275.
If the H.E.C. Davey River impoundment is implemented, this area will be within the flood plain. The University of Tasmania is in possession of live plants which I sent out.

BADGER CREEK WATERSHED DEPRESSION
Old River Sheet 8111/212728-222728

Dacrydium franklinii: Approximately 600 to 800 mature trees of 20m in height and 4.50m in circumference, another 400 trees of less than 1.60m circumference, abundance of saplings and seedlings on moss covered ground. This area has not experienced any fire for at least 2,500 years, except on the perimetre and a wedge burn of about 500m by 200m intruding into the rainforest from a small southern buttongrass plain, now revegetating with *Eucalyptus* and *Leptospermum scoparium.* Badger Creek drains this subterranean depression through fissures under the western ridge composed of Conglomerate and at some stage caved in or collapsed at a rate of about 30m. On the western side the creek emerges into a Canyon of some 800m length and 150m at its widest, 35m in depth, narrowing into a gorge before reaching the Davey River Plains at an 80m elevation. The canyon has experienced previous spot fires and except for juvenile *D. franklinii* no other botanical notes were taken there.

Continuing notes as above within the depression:
Pseudopanax gunnii of three different leaf variants, *Archeria hirtella, Anodopetalum biglandulosum, Anopterus glandulosus, Eucryphia lucida, Olearia persoonoides, Trochocarpa gunnii, Phylocladus asplenifolius, Aristotelia peduncularis. Epacris corymbiflora* on the buttongrass plain.

Juvenile *D. frankinii* were also found at Pine Creek under Cinder Hill and at Crossing River 2023-2123.

MT. RALLINGA (MELALEUCA RANGE)

Persoonia: Prostrate plant 15 cm across, leaves linear-spathulate, 7 mm long, 3 mm wide, 1 mm thick. Flowers in leaf-axils only, the same including the fruit as in *Persoonia gunnii.*
Approximately some 300 plants on the plateau in quarzite gravel, growing alongside with normal *Persoonia gunnii* bushes.
One plant, forwarded to *Dr. W. M. Curtis* and *Mr. D. I. Morris*, is growing successfully in a garden at Fern Tree for further study. The opinion of *Dr. Curtis* and *Mr. Morris* is that it is a new endemic variant for Tasmania.

MT. BROCK

Senecio primulifolius: Southern rock spur at 600m under stunted *Nothofagus cunninghamii, Richea scoparia* variant 4m high, leaves imbricate, soft, curly, linear-lanceolate, pointed end but not pungent, 3cm long, base broad and sheathing, margins only minutely scaberulous, further study of this variant is necessary, plants of the same description have been observed at Lake Dobson and near Waldheim.

Baechea leptocaulis: 3.20m high, trunk 35cm circumference, trees of this size common in saddle between Mt. Brock and the main ridge of Melaleuca Range at 500m level in semi sheltered position, *Dracophyllum milliganii,* 5m high, inflorescence 1.20m long, 60cm across, within watershed of Alexander Creek, Mt. Brock South.

RAY RANGE

Acradenia frankliniae: Ray River, 1.5km upstream from Moulters Inlet.

Dracophyllum milliganii: Common in wet gullies on the eastern side of Ray Range up to 720 m level.

Pseudopanax gunnii, Pimelea lindleyana, Townsonia viridis.

Dacrydium franklinii: At Old River and Bathurst Creek. The Ray Range suffered extensive damage in the 1934 fire, former alpine forests of *Nothofagus cunninghamii* now almost impenetrable, regrowth of *Leptospermum, Melaleuca,*

Banksia, cutting-grass, button-grass and *Bauera rubioides,* individual *N. Cunninghamii* now up to 1.50 m and rare in distribution, the same applies to *Atherosperma moschatum* standing at 2m, no regrowth of *Eucryphia lucida* or *milliganii* was observed.

NOROLD RANGE

Leucopogon milliganii rare, *Epacris corymbiflora, Archeria hirtela, Richea milliganii, Richea curtisiae* common and abundant in exposed situations in quarzite gravel, plants of 6 m high with normal size inflorescence of 10 cm.

In cases where main trunk of wind prostrated plants has been severed through hail and gravel action (trunk being knife shaped towards prevailing weather side, the same is the case with *Baekea leptocaulis* on Mt. Brock), terminal crowns on branchelets are rooting within the gravel and bearing inflorenscences.

Richea angustifolia, Richea pandanifolia, Richea scoparia, Dracophyllum milliganii and *Dracophyllum minimum* rare, *Milligania densiflora, Ewartia meridithae* rare, *Campynema lineare, Gleichenia abscida* within the gorge of eastern set of three un-named waterfalls, *Euphrasia kingii, Euphrasia gibbsiae* abundant not endemic, *Tetracarpaea tasmanica, Athrotaxis selaginoides* one single tree north of main peak at 800 m level.

Eucryphia lucida and *Eucryphia milliganii* growing side by side on rocky foreshore of unmapped Lake at 840 m level North-west of main peak.

ROWITTA PLAINS

Prasophyllum buftonianum: (Prasophyllum buftonianum also occurs at Gates Bluff on Freycinet Peninsula where blossoming time is usually end of March-begin - ning of April) while at Rowitta Plains blossoming time is only for a short period beginning of February.

Campynema lineare, Haemodorum distichophyllum: through observations over the years in the West-Southwest, I regard the Rowitta Plains and the Melaleuca area as the main stronghold of this plant.

Pterostylis parviflora var. *aphylla* consistently blossoming here in middle of January.

The Rowitta Plains, Mt. Rugby, the western and southern slopes of Mt. Wilson, Norold Range, Old River and part of Harrys Bluff where burned out at Christmas 1972: The endemic flora seems to survive and grow very slowly; *Baeckea leptocaulis* blossoming in the second year, *Agastachys odorata* in the fourth year, for the first time. *Lomatia polymorpha, Cenarrhenes nitida, Anopterus glandulosus* no blossoms as yet in summer 1976.

Lomatia tasmanica: South Bathurst Range at approximately 200m level within rainforest, trees of 5m high not uncommon, mainly along old water race and in small clearings. Main propagation seems to be from suckers along the root system; observations in 1976 showed that all ovaries were shrivelled up, therefore no pollination had taken place. Plants as indicated by Mr. D. King to be of a complete pubescent appearance and soft feathery leaves at lower elevations, I was not able to find.

Through mining activity up to 1935 the area has been consistently burned from sea level up to about 80 m elevation and there are no *Lomatia* plants left in this zone.

Although the tin deposits are of alluvial form originating from the Granite Moinse Ridge, the location of *Lomatia tasmanica* is on metamorphosed schist and quarzite, above the general 20 m elevation, East of Point Eric.

In my quest to expand the distribution knowledge of *Lomatia tasmanica* I chose, in 1975 and 1976, habitats similar to the South Bathurst Range as follows:

Louisa Bay, Anchorage Cove, Red Point Hills, Black Cliff Hills, Cox Bluff, Abeana Head to Smoke Signal Hill, New Harbour, Hidden Bay, Kitchem Bay and Amy Harbour, Window Pane Creek to Window Pane Bay, New Falls Creek area were visited in 1972 and again in 1976. No recordings were made. Therefore the only known location and stronghold of *Lomatia tasmanica* is the area within the South Bathurst Range at 200m elevation mentioned above.

INSECT PREDATION IN THE BRUSHTAIL POSSUM

Peter Murray (Tasmanian Museum)

Some insects and other small invertebrates are incorporated in the diet of the brushtail possum quite by accident. The proportion of arthropod remains in the stomachs of possums that can be attributed to purposeful insect predation is unknown. Possums rarely seem to be attracted to insects and frequently, when presented with a moth or fly, fail to even notice it.

Yet on one occasion I was able to witness an example of spontaneous insect predation by *Trichosurus*. The action was a fast, smoothly coordinated hand-mouth capture performed on a blowfly that had landed on a wall within reach of the possum. The room was well illuminated, a condition that might impair the possum's vision, which is better suited for nocturnal or crepuscular activity.

The possum began to act the instant the fly landed. There was no sign that the fly was noticed before it came to rest. The possum assumed a bipedal stance, hind limbs in full extension; the head aiming towards the fly but well short of it. The forelimbs closed around the insect from both sides, scooping it downwards to the mouth. The possum dropped to a sitting position and consumed its prey (Figure 1.).

This incident appeared stereotyped. There was no period of evaluation or hesitation of any sort. Perhaps the closeness of the newly alighted insect to the possum triggered the action.

The example suggests that brushtail possums have maintained adequate visual acuity, spatial perception and hand-mouth coordination for predation even though they are primarily herbivorous feeders.

Several sources, including Collins (1973) state that in addition to insects, possums probably also eat small birds. There is no direct evidence that *Trichosurus* actively pursues and captures birds. Possums are fond of meat when they are presented with it but it is likely that the prevailing idea that they capture birds stems from an observation by Waterhouse in 1846 of a captive brushtail devouring a dead bird that was thrown to it. However, it is probable that possums stalk and capture insects. The kind of movements shown by the above example suggests a patterned action response. As many phalangeroids are insectivorous, the presence of this characteristic in *Trichosurus* is not surprising.

Subsequent experimentation with captive possums yielded mixed results. The experimental subjects made few attempts to capture insects presented to them. However, those few responses obtained indicated that my original observation was not of an entirely unique event. It also demonstrated that the use of the hands in insect predation by brushtail possums is typical.

Possums that were attracted to insects (injured moths) presented to them on a horizontal surface, employed a paired forelimb pounce in order to catch them. The prey was held under one or both paws until the snout could be inserted under the palms, through a "cage" of claws. Insects frequently escaped at this stage of predation.

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Collins, L.R.
1973 Monotremes and Marsupials: A Reference for Zoological Institutions. Smithsonian Institution Press, Washington

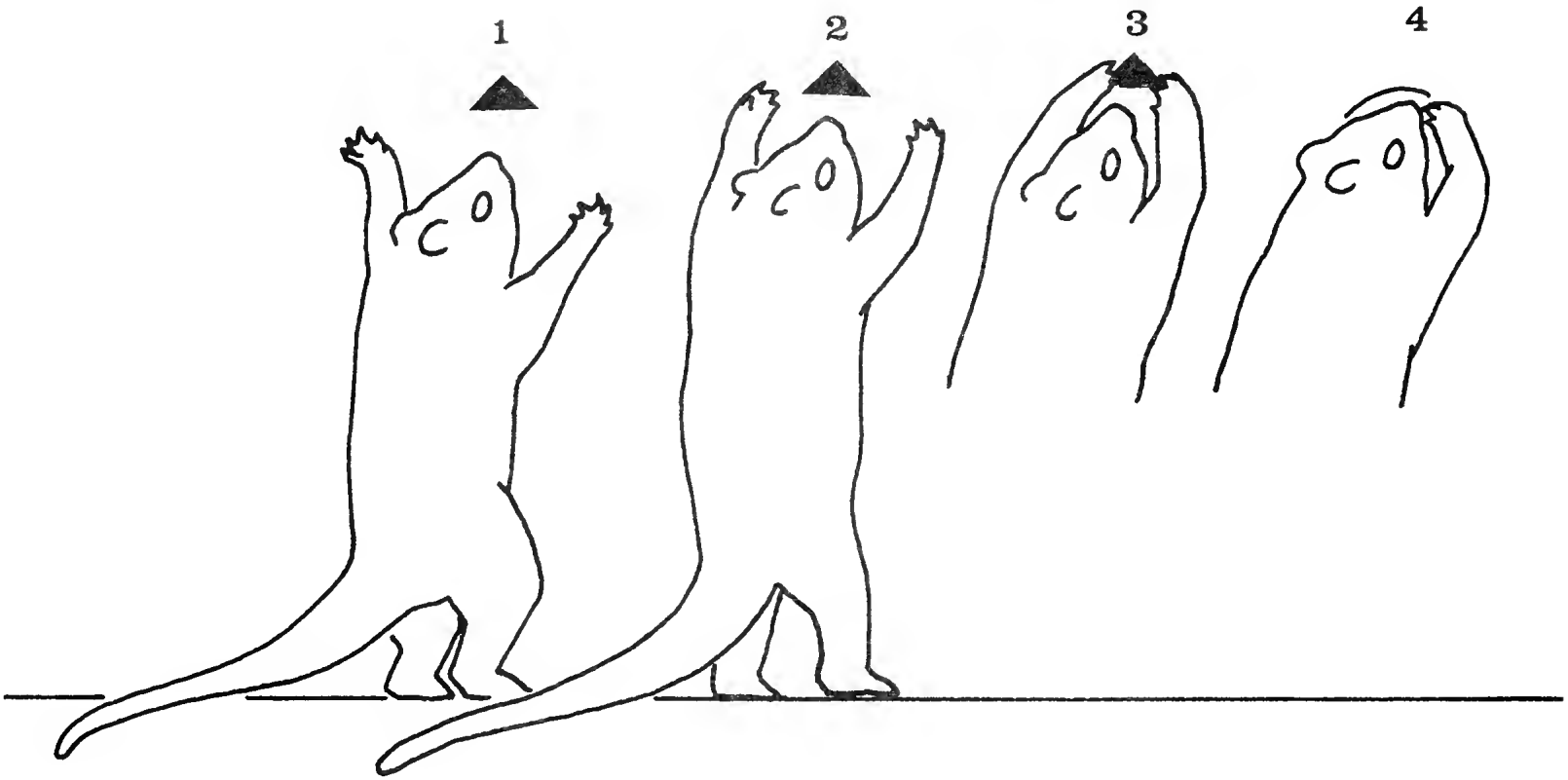


Figure 1. Sequential drawing of six month old T. vulpecula capturing a fly landed on a vertical surface (wall); 1, assumption of bipedal stance; 2, full extension of hind limbs; 3, full extension of forelimbs; 4, drawing insect towards the mouth and beginning to drop to sitting posture.

A KING CRICKET IN TASMANIA

(Orthoptera : Stenopelmatidae)

Alison Green (Tasmanian Museum)

An insect now in the Tasmanian Museum's collection represents a new record for Tasmania. It is a male King Cricket, a fearsome-looking specimen with a body length (head included) of 75 mm. It is brown in colour and wingless, with a massive head and antennae longer than the body. The large jaws, each 15mm long, could deliver a painful bite; however, there is no venom associated with these.

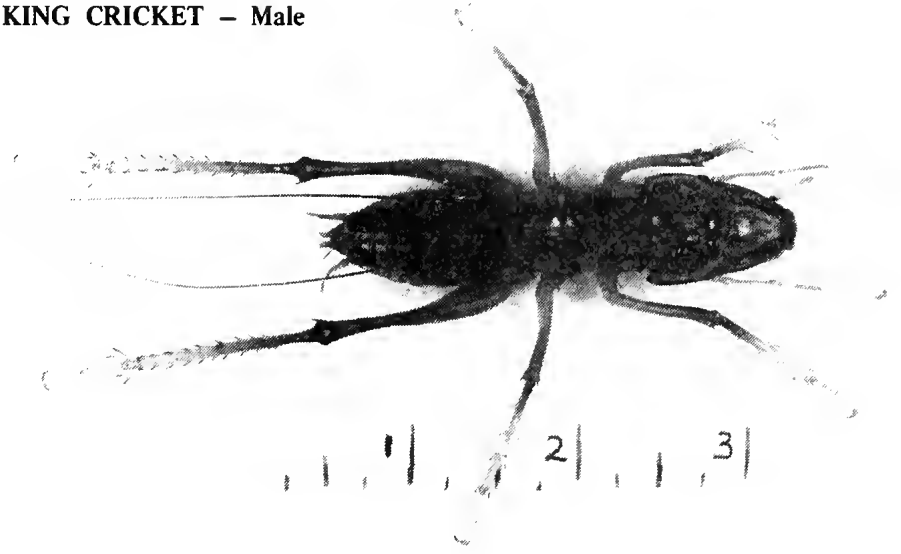
The king cricket was collected on the 6th February, 1977, by Carl Cazaly and his father, Mr. R.L. Cazaly, in bushland near their home in Brushy Creek Road, Lenah Valley (a suburb of Hobart). It was found about three feet underground, among loose, shaly rock, near eucalypt trees. The insect was still very lively when it was given to the museum next day by Carl and his brother, Zane.

King crickets belong to the same family (Stenopelmatidae) as the wetas of New Zealand. Their nearest relatives in Tasmania are the cave crickets and "tree crickets", which are placed in different families, while the long-horned grasshoppers and the true crickets, in different superfamilies, are one step further away.

King crickets occur near the eastern coast of mainland Australia where they live in rotting logs and other such hiding places. A drawing of a male of *Australostoma opacum* (Brunner), fig. 21. 3A in "Insects of Australia" (Melbourne University Press: 1970), shows the general appearance of these insects.

The Tasmanian specimen belongs to the same genus, *Australostoma,* as the mainland king crickets but the species which it represents has not yet been determined. The most likely possibility is *Australostoma australasiae* (Gray); however, a comparison with named examples is needed to confirm this guess. No previous record of a king cricket in Tasmania has been traced. It is surprising that such a spectacular insect had escaped notice until now.

KING CRICKET – Male



THE TASMANIAN MUTTON-BIRD

Irynej Skira

The Tasmanian mutton-bird or short-tailed shearwater, *Puffinus tenuinostris* forms the basis of one of Tasmania's oldest industries. This birding industry is still carried on commercially in the Hunter Islands off the North West Coast and in the Furneaux group. In the south of the State the mutton-bird rookeries are open only to non-commercial operators.

An estimate of the "catch" each season gives an idea of how large these mutton-bird rookeries are. No figures exist for the southern rookeries but few of them would have more than 20,000 chicks. In Northern Tasmania in 1976 over 160,000 birds were taken off Trefoil Island and over 110,000 each off Big Dog Island and Babel Island. Mt. Chappell Island once one of the largest commercial rookeries has been closed for some years, not only on account of its being a State Reserve but probably also because of its snakes. Even as late as 1959 an expedition raised by the local Flinders Island policeman killed 200 snakes in a day.

The number of chicks taken each year, is unrelated to the number that eventually fly away, but it is thought that about 60% of those birds that could have flown off are taken.

What research is being done on mutton birds? In 1947 research was initiated by the former Tasmanian Fauna Board and CSIRO Wildlife Division and the task given to Dr. Dominic Serventy. A base was set up on Fisher Island, just off Lady Barron on Flinders Island and basic biological studies were carried out on Fisher Island,Cat Island and other islands in Franklin Sound. Most of the work was carried out in the 1950's but today birds and their progeny are still banded on Fisher Island.

Dr. Serventy found that the birds return in late September, clean out their old burrow and lay one egg in late November, the peak of egg-laying being confined within three days. Birds do not breed until 5 or 6 years old but live to a ripe age, one bird on Fisher Island now being at least 34 years old and chicks banded on Fisher Island in 1949 and 1950 are still returning today!

Research by the National Parks and Wildlife Service is not biology orientated but management orientated. Its purpose is to know how many birds can be taken without upsetting the viability of a rookery. Formerly, up to 1000 chicks were banded on Big Dog and Little Green Islands in the Furneaux group and 400 at Cape Queen Elizabeth, on Bruny Island. From the number of bands returned an idea was obtained of how many birds 'escaped.' This method depended on the goodwill of all sorts of birders and many bands were either overlooked or not returned.

A more efficient technique was therefore needed. A comparison is now made of the number of chicks present before and after the season. Allowing for some deaths and early departures a much more accurate estimate of the "catch" can be obtained. However more data is required before preliminary findings can be reported.

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MACQUARIE

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Type Shells from the May Collection in the South Australian Museum

M.K. Macphail & W. Zeidler,
South Australian Museum,
North Terraee, ADELAIDE. S.A. 5000.

In 1929, the South Australian Museum acquired [1] several thousand shells collected by the prominent Tasmanian conchologist, W.L. May. Amongst these were some 1000 mounted and fully labelled Tasmanian shells which provided the basis for May's (1921) **Checklist of the Mollusca of Tasmania** and his invaluable (1923) **Illustrated Index of Tasmanian Shells** (see May 1923). Included are 150 Tasmanian specimens labelled in May's handwriting as "Cotypes". In this paper we list these *Type* specimens as an aid to future research (c.f. Turner and Dartnall 1971) and to re-emphasize their collector who in his time was a leading member of the Tasmanian Field Naturalists Club.

(A) W.L. May

William Lewis May was born in South Australia in 1861. With Ralph Tate, Professor of Geology at Adelaide University, he studied the types and reputed types of molluses held in the Tasmanian Museum with a view to bringing "these insufficiently known Tasmanian species into an alignment with better known speeies inhabiting other parts of the Australian eoast" (Tate & May 1901: p. 345). In his lifetime, May overturned this position: at the time of publication, his "Illustrated Index" was the only illustrated complete account of the molluses of any Australian State.

Tate and May's (1901) "Revised Census of the Marine Molluscs of Tasmania" was the second such checklist foi this State, extending the list made by the Rev. J.E. Tenison-Woods in 1878 and incorporating subsequent studies by H.D. Atkinson, C.E. Beddome, C. Hedley, W. Legrand, M. Lodder and W.F. Petterd. May's personal copy of the "Revised Census", held in the S.A. Museum Library, contains obituary

[1] purchased by Sir Joseph C. Verco, honorary Curator of Molluscs at the South Australian Museum (1914-1933) and presented by him to the Museum.

notices of his fellow collectors. This copy is extensively annotated, showing the rapid progress made in Tasmanian conchology after 1901 - a subject in which May became the esteemed and sole arbitrator for the next quarter century (Iredale 1925). An excellent draftsman, May illustrated most of his publications with original drawings, including the 1923 'handbook'. Some of these pen and ink and watercolour sketches of new species are preserved along with tracings of shells in his "Revised Census" copy.

May's shell collecting was principally made along the East Coast, Frederick Henry Bay, the Tasman Peninsula, the Derwent Estuary and D'Entrecasteaux Channel, Maria Is. and Freycinet Peninsula, but also extending during the last decades of his life to the North-West Coast and Bass Strait. Much was done in conjunction with the Tasmanian Field Naturalists Club, particularly on those occasions when the Club chartered a small steamer to take members to the traditional Easter "camp out" (e.g. May 1911). May used these steamers to augment the deep sea shell dredgings carried out by himself and Hedley in 1907 off Cape Pillar. The 1907 effort, several hours work on the 17th and 18th of December, yielded some 90 new records of shells for Tasmania, including some 45 new species! (Hedley & May 1908; May 1911, 1916, 1919).

May died on August 30th 1925.

The number of valid species remaining under May's name testify to his acumen and revised checklists of both freshwater and marine molluscs (May 1921a, 1921b) remain 'foundations' in taxonomic research some 50 years later. Species such as *Ischnochiton (Ovatoplax) mayi* Pilsbury 1895, *Orbitestella mayi* Tate 1899, *Eulimaustra mayi* Tate 1900, *Myrtea mayi* Gatliff & Gabriel 1911, *Acutoplax mayi* Torr 1913, *Tectisumen mayi* Finlay 1926 and *Glycymeris mayi* Cotton 1947, record the high regard of other malacologists for May and perpetuate his contribution to Tasmania's natural history.

(B) May's Cotypes

The "Cotypes" held by the South Australian Museum are most likely *Paratypes*, i.e. specimens upon which the original published description of a species was based but from which a *Holotype* was selected by the author. Some may be *Syntypes*, if no *Holotype* was designated. In either case, the specimens are of considerable scientific value at the present time when museums and other repositories of *Type* material are loath to permit outside lending of *Holotype* specimens.

No attempt has been made to update the synonomies as this would be beyond the scope of this paper. These may be found by reference to Cotton (1959, 1961, 1964), Macpherson and Gabriel (1962) or the Tasmanian Museum. Numbers in parentheses after each refer to May's (1921) Checklist: D registration numbers refer to the South Australian Museum Register of Mollusca. Mollusc families follow Cotton (ibid). A biblography of works, known to us, by or about W.L. May is appended.

CREPIPODA

Callochitonidae:	*Callochiton elongatus* May 1920 (230) D12696.
Ischnochitonidae:	*Ischnochiton atkinsoni* Iredale & May 1916 (233) D15678.

	* *Ischnochiton iredalei* Dupuis 1918 (236) D12718.
Lepidopleuridae.	*Lepidopleurus columnarius* Hedley & May 1908 (226) D15679.

PELECYPODA

Condylocardiidae:	*Condylocardia compressa* Hedley & May 1908 (111) D15612.
Crassatellidae:	*Cuna delta* Tate & May 1900 (98) D15611.
	Cuna hamata Hedley & May 1908 (99) D15606.
Leptonidae:	*Legrandia bernardi* Tate & May 1901 (148) D15608.
	Myllita polita May 1924 (not listed) D15614.
Philobryidae:	*Philobrya subpurpurea* May 1924 (not listed) D15613.
Sphaeriidae:	*Pisidium tasmanicum* Tenison-Woods 1876 (152) D15616.
Thraciidae:	*Pholadomya tasmanica* Hedley & May 1914 (74) D15615.
	Thraciopsis elongata May 1916 (73) D15610.
Verticordiidae:	*Verticordia tasmanica* May 1916 (85) D15605.

GASTROPODA

Acmaeidae:	*Asteracmea illibrata* var. *mellila* Iredale 1924 D15707.
Ancylidae:	*Ancylus mariae* Petterd 1902 (887) D15801.
	Ancylus tasmanicus Tenison-Woods 1876 (888) D15827.
Capulidae:	*Capulus devexus* May 1916 (519) D15776.
Cerithiopsidae:	*Cerithiopsis apicostata* May 1920 (531) D15777.
	Cerithiopsis mamilla May 1920 (534) D15778.
	Cerithiopsis trisculpta May 1913 (536) D15779.
Cocculinidae:	*Cocculinella tasmanica* May 1920 (387) D15728.
Cymatiidae:	*Eugyrina petulans* Hedley & May 1908 (601) D15785.
	Personella columnaria Hedley & May 1908 (604) D15786.
Fasciolariidae:	*Fusus schoutanicus* May 1911 (800) D15830.
Liotiidae:	*Brookula consobrina* May 1924 D15727.
	Cirsonella translucida May 1916 (353) D15732.
	Crossea consobrina May 1916 (569) D15680.
	Liotella petalifera Hedley & May 1908 (371) D15725.
	Liotina densilineata Tate 1899 (376) D15722.
	Lissotesta porcellana Tate & May 1900 (362) D15723.
	Rissoa pertranslucida May 1913 (362) D15726.
Littorinidae:	*Melaraphe praetermissa* May 1909 (405) D15729.
	Risellopsis mutabilis May 1909 (409) D15735.
Lymnaeidae:	*Amphipeplea huonensis* Tenison-Woods 1876 (875) D15686.
	Limnaea gunnii Petterd 1889 (876) D15684.

* Type status uncertain.

Limnaea subaquatilis var. *neglecta* Petterd 1889 (877) D15687.
Limnaea lutosa Petterd 1889 (877) D15685.

Marginellidae:
Marginella altilabra May 1911 (647) D15789.
Marginella auriculata May 1916 (693) D15811.
Marginella caduocincta May 1916 (650) D15794.
Marginella columnaria Hedley & May 1908 (651) D15798.
Marginella concamerata May 1918 (652) D15790.
Marginella connectans May 1911 (653) D15795.
Marginella consobrina May 1911 (654) D15792.
Marginella cratericula Tate & May 1900 (655) D15800.
Marginella dentiens May 1911 (658) D15791 & D15796.
Marginella diplostreptus May 1916 (659) D15797.
Marginella gabrieli May 1911 (663) D15805.
Marginella georgiana May 1915 (666) D15803.
Marginella hedleyi May 1911 (667) D15799.
Marginella inaequidens May 1913 (668) D15804.
Marginella incerta May 1920 (669) D15806.
Marginella indiscreta May 1911 (671) D15813.
Marginella lodderae May 1911 (675) D15814.
Marginella maugeana Hedley 1915 (677) D15815.
Marginella microscopica May 1911 (656) D15793.
Marginella multidentata May 1920 (680) D15802.
Marginella obesula May 1920 (683) D15809.
Marginella praetermissa May 1916 (685) D15808.
Marginella procella May 1916 (672) D15810.
Marginella ringens May 1913 (687) D15807.
Marginella schoutanica May 1913 (688) D15811.
Marginella vercoi May 1911 (696) D15816.

Melanellidae: (Eulimidae)
Eulima columnaria May 1916 (979) D15842.
Eulima cunaeformis May 1916 (980) D15845.
Eulima expansilabra May 1911 (986) D15877.
Eulima schoutanica May 1916 (988) D15846.

Mitridae:
Microvoluta purpureostoma Hedley & May 1908 (790) D15824.
Mitra pumilo May 1916 (783) D15825.

Muricidae:
Trophon columnarius Hedley & May 1908 (841) D15838.
Trophon molorthus Hedley & May 1908 (846) D15839.
Trophon sarmentosus Hedley & May 1908 (850) D15837 & D15854.

Nassariidae:
Nassarius mobilis Hedley & May 1908 (804) D15831 & D15832.

Naticidae:
Natica elkingtoni Hedley & May 1908 (611) D15788.
Natica schoutanica May 1913 (613) D15787 & D15867.

Omalogyridae: (Orbitestellidae)
Orbitestella iredalei May 1920 (382) D15724.

Paludestrinidae: (Hydrobiidae)
Petterdiana lauucestonis var. *minima* Petterd 1889 (507) D15774.
Petterdiana lauucestonis var. *tumida* Petterd 1889 (507)

Potamopyrgus brownii Petterd 1889 (496) D15767.
Potamopyrgus dunrobinensis Tension-Woods 1876 (499) D15769.
Potamopyrgus elongatus May 1921 (498) D15770.
Potamopyrgus legrandi Tenison-Woods 1876 (501) D15768.
Potamopyrgus marginata Petterd 1889 (500) D15772.
Potamopyrgus pontvillensis Tenison-Woods 1876 (499) D15771.
Potamopyrgus tasmanica Tenison-Woods 1876 (501) D15773.

Philinidae:
Philine columnaria Hedley & May 1908 (1028) D15847.

Pyramidellidae:
Cingulina insignis May 1911 (950) D15892.
Odostomia occultidens May 1916 (965) D15841.
Odostomia nuprasculpta Tenison-Woods 1877 (968) D15765.
Pseudorissoina capiticava Hedley & May 1908 (997) D15849.
Syrnola harrissoni Tate & May 1900 (956) D15840.
Turbonilla tiara May 1911 (976) D15844.

Pyrenidae:
Aesopus solidus May 1911 (826) D15833.
Retizafra multicostata May 1911 (834) D15836.
Zafra columnaria May 1916 (829) D15835.

Rissoidae:
Amphithalamus triangulus May 1916 (469) D15747.
Dardanula aurantiocincta May 1916 (435) D15739.
Dardanula erratica May 1913 (437) D15737.
Epigrus semicinctus May 1916 (465) D15759.
Estea columnaria Hedley & May 1908 (442) D15754.
Estea flindersi Tenison-Woods 1876 (443) D15755.
Estea labrotoma May 1920 (449) D15756.
Estea microcosta May 1920 (450) D15757.
Estea perpolita May 1920 (453) D15750.
Estea pertumida May 1916 (454) D15749.
Estea puer May 1921 (455) D15760.
Estea rubicundra Tate & May 1900 (456) D15753.
Estea tiara May 1916 (458) D15748.
Haurakia supracostata May 1920 (414) D15740.
Lironoba archensis May 1913 (417) D15741.
Lironoba freycineti May 1916 (418) D15742.
Lironoba schoutanica May 1913 (421) D15743.
Merelina sculptis May 1919 (431) D15736.
Merelina seminodosa May 1916 (432) D15745.
Merelina suprasculpta May 1916 (433) D15744.
Merelina thouinensis May 1916 (434) D15746.
Notosetia pellucida Tate & May 1900 (471) D15746.
Notosetia purpureostoma May 1920 (472) D15751.
Notosetia simillima May 1916 (473) D15752.
Rissopsis buliminoides Tate & May 1900 (483) D15762.

	Rissopsis columnarius May 1911 (484) D15766.
	Rissopsis consobrina Tate & May 1900 (485) D15763.
Rissoinidal:	*Rissoina fausta* Hedley & May 1908 (479) D15758.
	Rissoina lintea Hedley & May 1908 (478) D15761.
Scissurellidae:	*Scissurella ornata* May 1909 (273) D15851.
Styliferidae:	*Eulima munita* Hedley 1903 (986) D15843.
Trichotropidae:	*Lippistes consobrina* May 1920 (571) D15781.
	Lippistes torcularis Tenison-Woods 1878 (573) D15782.
Truncatellidae:	*Coxiella badgerensis* Johnston 1879 (513) D15850.
Trochidae:	*Basilissa niceterium* Hedley & May 1908 (339) D15733.
	Calliostoma columnaria Hedley & May 1908 (331) D15697 & D15733.
	Calliotrochus galbina Hedley & May 1908 (322) D15370.
	Calliotrochus hisseyana Tenison-Woods 1876 (323) D15731.
	Euchellus profundior May 1916 (342) D15734.
Turridae:	*Apaturris costifera* May 1920 (719) D15818.
	Epideira tasmanica May 1911 (714) D15817.
	Gatliffena fenestrata Tate & May 1900 (?) D15855.
	Guraleus schoutenensis May 1911 (729) D15820.
	Leucosyrinx esperanza May 1911 (715) D15819.
	Mangelia pagoda May 1911 (766) D15826.
	Nepotilla aculeata May 1916 (751) D15822.
	Neoptilla microscopica May 1916 (758) D15823.
	Pseudodaphnella nodorete May 1916 (746) D15821.
Turritellidae:	*Glyptozaria columnaria* Cotton & Wood 1935. (Holotype: specimen collected by Hedley & May 1908) D11438.
	Turritella microscopica May 1911 (560) D15780.
Vermetidae:	*Magilina caperata* Tate & May 1900 (583) D15784.
	Stephopoma nucleocostata May 1916 (580) D15783.

SCAPHOPODA

Siphodentaliidae:	*Cadulus spretus* Tate & May 1900 (1048) D15848.

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Addendum

PELECYPODA

Propehyridellidae	*Rugoshyria depressa sodalis* Iredale 1934 (May's 156 redescribed) D15988

GASTROPODA

Charopidae	*Endodonta hookeriana* Petterd 1879 (911) D15977
Liotiidae	*Zalapais Lissa* Suter 1908 (365) D15984
Marginellidae	*Marginella gatliffi* May 1911 (664) D15987

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THE DISCOVERY OF TASMANIA AND MAN'S EFFECT ON THE ENVIRONMENT

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Until recently the Tasmanian Aborigines were described as a race separated not only geographically but also physically and genetically from their Australian neighbours. As the scope of archeological discovery and investigation widens, the former ambiguities over racial origin and environmental balance lessen. This paper summarizes the evidence that suggests the Tasmanian natives originated from the Australian mainland and reviews the literature to suggest that rather than be in balance with his environment, Tasmanian prehistoric man was totally at its mercy.

Initially two questions must be answered, (a) from where did the Tasmanian natives come and (b) by whom was this island discovered. Let us consider the most obvious population source - the Australian mainland. From many archaeological discoveries we have good reason to believe that it is from the Australian mainland that the Tasmanian natives originated. Throughout Australia the Aborigines displayed a stone technology that had strong morphological similarities. This may be termed the Australian core tool and scraper tradition (Jones, 1971). Basically this tradition was characterised by the style of retouch and types of tools. Most of the tools were hand-held scrapers. This kind of tool dates from the earliest records of man until approximately 5,000 years B.P. (Before Present) and was characterised by a large variety of scrapers made from a core material (Fig.1) and a variety of flake scrapers with steep edges (Fig.2) and many small scrapers with delicately shaped edges (Figs.3 and 4).

As one may expect there are broad regional differences within this tradition, characterised by the frequency of certain tools used. For example, Tasmania was characterised by a higher proportion of notched, concave and nosed scrapers (Figs. 3 and 4), the coastal region of N.S.W. displays a low but persistent occurence of small, carefully made denticulate pieces and in South Eastern Australia the scrapers are smoothly re-

touched with long convex edges (Jones, 1971). Stone tool similarities would seem to link Tasmanian culture to the mainland culture.

Recent studies also tend to reduce the numbers of physical traits thought to distinguish the Tasmanians from the Southern Australian natives. For example, there is general agreement as to the similarity between Tasmanian and Australian skulls. The differences include (Jones, 1971) a longer, wider, yet less deep skull interior, a lower face with lower eye sockets and broader nasal openings. The roof of the mouth was also shorter due to a smaller area of bone at the rear of the mouth. There seems therefore, to be some deviation in facial form, yet the Australians and Tasmanians were most probably derived from a common racial stem.

Excavations by Dr. Rhys Jones at West Point, near Marrawah, revealed skeletal material which was very similar to individuals from coastal New South Wales. We can conclude that Tasmanians are probably local variants of the southern Australian population and differences that do exist are probably due to environmental pressures and genetic factors resulting from population restraints. The anatomical picture therefore fits the archaeological picture very well.

In addition to the archaeological and anthropological similarities there are definite similarities between the Tasmanian and Southeast Australian cultures. These include similarities in economic systems, organization of society, the technology of spears, waddies, baskets, huts, stone tools and in the use of ochre for burial, ceremonial practices and art.

However, after 10,000 B.P. Tasmania became an island, eventually separated from Australia by 320 km. of water. Influences that diffused through the Australian culture after this time did not affect the Tasmanian culture. This explains the absence of the dingo, boomerang, spear thrower, hafted tools, a variety of small stone types (backed microliths), adze flakes and points, compound disposal of the dead and some religious customs. (Jones, 1971).

If it is acceptable that the Tasmanians find ancestry with the Australian natives, we must now consider how they discovered Tasmania. This is quite simple. Until 10,000 years ago the Pleistocene sea level was some 60m. below its present level. Man had entered Tasmania some 23,000 years ago (Bowlder and Hope, 1976) and reached southern Tasmania by 12,000 B.P. (Goede and Murray, 1976) , as Tasmania was connected to Australia by a low land bridge (Fig.5) some 65-70 km. wide, running up the eastern side of Tasmania.

Environment

Evidence from pollen analysis at Pulbeena Swamp, N.W. Tasmania, indicates that the vegetation of North West Tasmania between 10-25,000 years B.P. consisted of grasslands in which shallow, poorly drained swamps ocurred (Colhoun, 1976). These grasslands extended across the North Coast of Tasmania (including the Bass Strait landbridge) and through the midlands to the lower reaches of the Derwent Valley. The mountains and plateaux of the centre and south west displayed alpine grasslands.

The climate into which the Aborigine first ventured was colder and drier with temperatures being 8°C lower than at present. Cold, frosty winters were succeeded by spring floods, accentuated by snow melts and followed by relatively warm and dry summers. From 11,500-9,500 B.P. marked increases in precipitation produced rapid increase and altitudinal zonation of forests - which remain the dominant vegetation today.

Throughout Australia during the Pleistocene there seem to be several environmental themes. There is evidence for an Australian dry period before 10,000 B.P. (Kershaw, 1976; Hope, 1976). This was subject to fluctuation and local variations, particularly on the coasts, with the central Australian region being affected little by Pleistocene climatic changes (Jones, 1968). After 10,000 B.P. there seems to be an increase in temperature and precipitation. Again the major impact of this change was felt in coastal areas, presenting an environment of invading forest.

The predatory relationship between the Tasmanian Aborigines and the giant marsupial is very uncertain. Goede and Murray (1976) suggest that "the mega-fauna contained in Tasmanian Pleistocene localities appears to be very similar to the mainland, particularly Southern Australia." They suggest that the mega-faunal elements in the late Pleistocene of Tasmania had been isolated from their mainland counterparts for only a short period before their extinction. However, there is still some uncertainty as to actual date of extinction. As the Tasmanian evidence is inconclusive this portion of the paper only considers the evidence from the mainland.

Australian Pleistocene fossils contain the extinct marsupials *Thylacoleo*, *Nototherium*, *Diprotodon*, *Phascolonus*, *Procoptodon* and the flightless birds *Dromornis* and *Genyornis*. Extinction of these species was very rapid and archaeological sites of less than 20,000 B.P. on the mainland do not show mega-faunal remains. The most recent dates for mega-fauna are from Keilor (Vic.) 30,000 B.P. and Lake Menindee (N.S.W.) 25,000 B.P. (Jones, 1968).

Extinction has previously been blamed on post glacial aridity. This may not be acceptable in the light of recent research as,

(a) this fauna had survived previous climatic 'drys'
(b) evidence tends to suggest these marsupials were tolerant if not well adapted to drier environments. For example the fossilized stomach contents of a *Diprotodon* contained vegetable material similar to today's salt bush communities.
(c) the extinction on the mainland became most pronounced around 20,000 B.P. - well before any post-glacial aridity.
(d) it is likely there was no post-glacial aridity.

Considering these findings, it would appear that man was the only factor facing the marsupials to which they were not adapted. An analogy is found in America where "Pleistocene fauna had survived all climatic changes until the arrival of man - they disappeared not because they lost their food supply, but because they became one." (Jones, 1968). Similar evidence is

found in Malagasy and New Zealand where much of the endemic fauna became extinct only in the last 1,000 years, the time man colonized these islands. If man did not play a major role in the extinction of Australian mega-fauna he must have accelerated it. By analogy with other continents, and lack of alternatives, one must conclude that the arrival of man was the decisive factor in the extinction of Australian marsupials.

Fire

Fire was the Aborigines most powerful tool. The vegetation of Australia is certainly fire adapted and had most likely been a major ecological factor for millions of years. The advent of man must have increased the frequency of this factor.

In mainland Australia and Tasmania fire was used continuously, the dry climate and inflammable vegetation being conductive to widespread environmental damage. The first accounts of fires in Tasmania give some indication of the use of fire by the Aborigines. Tasman (1964) while sailing up the D'Entrecasteaux Channel in 1642 stated "now and then we saw clouds of dense smoke rising up from the land." Peron (1809) noted that "in every direction immense columns of flame and smoke arose. All the appointed sides of the mountain were burning.....for the extent of several leagues." The following day in the Derwent estuary "wherever we turned our eyes we beheld the forest on fire." Robinson (1966) records many observations of the Tasmanians' use of fire, or of burnt areas.

The Aborigines carried fire in the form of fire sticks and lit the bush as a matter of course as they moved through. For example, Labillardiere (Feb. 14, 1792) describes a group of people "one of whom carried a lighted piece of decayed wood in his hand, he.....amused himself now and again by setting it to a tuft where there were some dry herbs." Peron (1809) described an Aborigine with "a lighted fire brand in his hand, setting fire here and there to the bushes which covered the land."

Fire was used universally to alter, if only temporarily, the vegetation over vast areas. If areas are not reburned regeneration occurs quickly. Today on the south coast of Tasmania there is inaccessible scrub which Robinson refers to as easy walking. On the west coast near West Point, which is still burned regularly, our bush still looks the same as Robinson described.

The *Poa* grasslands of Surrey and Hampshire Hills - described by the explorer Helleyer as open grass country - have been rapidly returning to forest in the past 100 years. On the mainland savannah woodland becomes forest within 50 years if fire is prevented (Jones, 1968).

In high rainfall areas of Tasmania there are complex ecological ratios of soil fertility, aspect and fire frequence, the latter being most important. For example we have a wet sclerophyll (mosaic of *Eucalyptus* forest) with a medium fire frequency and wet scrub and sedgeland with high fire frequency.

Constant fires impoverish the land due to leaching of soils and if this occurs the process may not be reversible. Jackson

(1965) argues that rain-forest does not occupy anything like its full range because of firing by the Aborigines. The rain-forest is inhospitable to man - dank and dark with a few edible animals (Guiler, 1965). On the other hand sclerophyll mosaic forest holds plenty of food, is easily burned and therfore makes easy passage for the fire starter. Aborigines lived in areas that are now rain-forest.

Along the west coast there is extensive sedgeland - where the climax vegetation should be rain-forest. The maintenance of the sedgeland depended on constant firing. Although there is a great difference in the environments of east and west Tasmania, Hiatt (1967) has found surprising similarity in the ethnographically recorded diets from both areas. This could not be the case if sedgeland did not exist and it may be that through fire the Aborigines maintained an environment suitable to their economy in areas normally closed to them. Faunal evidence at West Point, near Marrawah, suggests sedgeland for the last 2,000 years (Jones, 1968).

The eastern part of Tasmania displays large open areas of *Poa* grass. Jackson (1965) says there seems "no doubt that this condition was produced by a long firing by the Tasmanians." This was most probably a conscious policy, carried out by the Aborigines to attract and hunt game. Robinson (April 3, 1829) describes an open country interspersed with wooded copses that were intended for hunting kangaroos, having "been done by the natives, when burning the undergrowth they have beaten out the fire in order to form these clumps."

There is no questioning the fact that the Tasmanian natives used fire liberally to maintain their environment. However, the actual significance and environmental impact of fire may be over-estimated.

Colhoun (1976) describes an environment in Tasmania which from apprcximately 25,000 years B.P. was grassland. Approximately 10,000 B.P. Eucalypt forests began to dominate. Man occupied Tasmania from at least 23,000 B.P. and lived in an environment with much more open forests than seen by European man. These conditions persisted until 10,000 B.P., when, due to increased moisture Eucalypt forest expanded rapidly. These vegetation patterns seem to be totally independent of man, a low precipitation producing grassland and a higher precipitation forest. The effect of man-made fire may not have created the grasslands or open forests prevailing today; rather man could only contest forest encroachment on his favoured, open environment. Consequently man may have been faced with an increasingly inhospitable environment in which fire was his only way of maintaining the environment to which he was best adapted. Fire therefore, may not have been a significant tool in the formation of our present environment.

Conclusion

Results from Lynch's Crater on the coast of North East Australia (Kershaw, 1976) tends to support the hypothesis that climate is a significant factor in the formation of our present environment. He puts forward a 'climatic anthropogenic' hypothesis for the rain-forest - sclerophyll transitions that

occured between 38-28,000 B.P. The vegetation he claims "would have been under stress through lower rainfall and would have been more susceptible to human interference through fire and therefore more easily destroyed." This may account for the period 38-20,000 B.P. but Kershaw gives no explanation for the rapid increase in rain-forest after 10,000 B.P., except evidence of increased rainfall. This creates an inconsistency in the theme that the Aborigines could control and modify their environment thrcugh the use of fire. This vegetation curve is very similar to that described by Colhoun (1976) and suggests to us that the Aborigines, at least in their Northern Australian and Tasmanian environments, played little part in the overall pattern of vegetation. This may indicate the Aborigines were totally at the mercy of the environment which was becoming increasingly hostile towards them.

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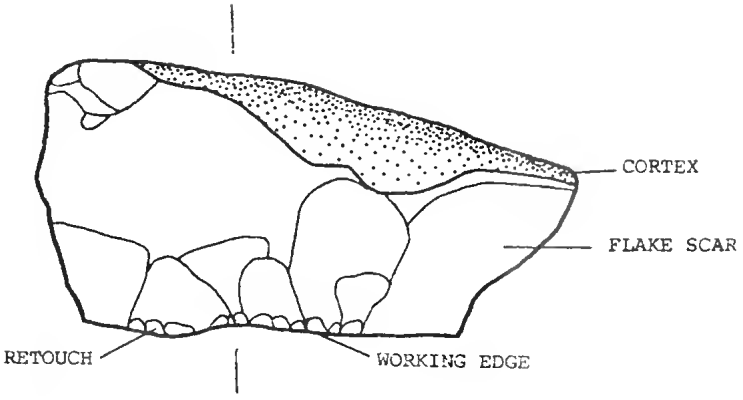
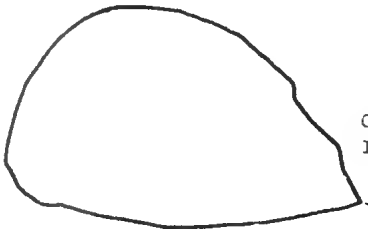
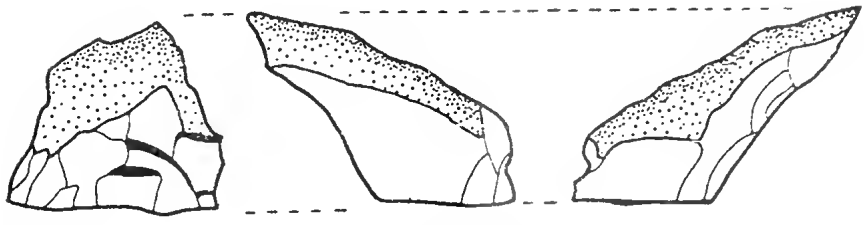


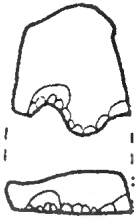


1. PEBBLE CORE SCRAPER



2. STEEP EDGED FLAKE SCRAPER

3. CONCAVE FLAKE SCRAPER



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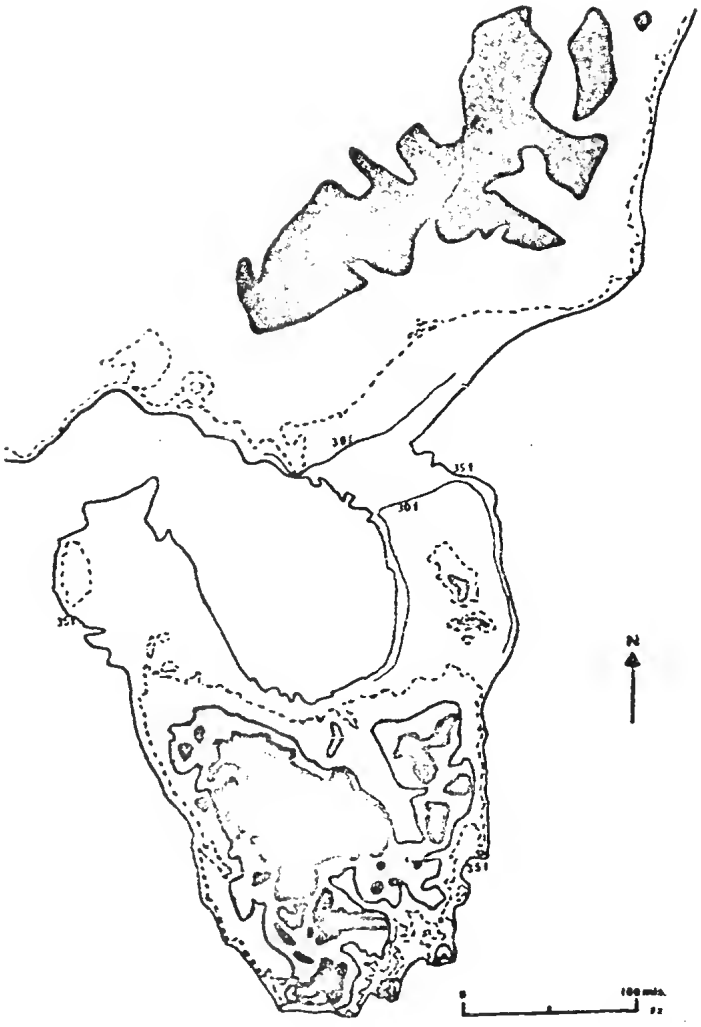

Fig. 5 PLEISTOCENE LAND BRIDGE ACROSS BASS STRAIT.
(after Jones, 1968).

SOME PLANT RECORDS FOR THE CAPE BARREN ISLAND WILDERNESS AREA.

J. S. Whinray

The Furneaux Group is in south-eastern Bass Strait and Cape Barren, which is about 44,000 hectares in area, is its second largest island. Some clearing has taken place at its western end and at Puncheon Head, the north-eastern point. Although part of the island was referred to by the Australian Conservation Foundation (1975) as a potential minor Wilderness Area, no specific section of the island was mentioned.

The present article gives some details of the plants of the part of the island which I call the Wilderness Area. They are drawn from notes taken during my many visits from 1969 to 1976. Specimens of unusual species lodged at Australian herbaria are indicalted in the text by the first letters of the cities in which the herbaria are situated.

The Wilderness Area

The Wilderness Area, which is about 34,000 hectares in area, is the portion of the island east from the foothills of Mount Munro, excepting Puncheon Head (see map). Its highest land is Double Peak (512 metres) by the western edge and Mount Kerford (500 metres) in the south-east. The Battery Bay Hills and the few other hills are much lower. There are many swamps on the extensive flats and gently sloping plains. One of the lagoons is dammed behind high coastal sand dunes. Another is separated from the sea by a bare, low, narrow beach. All of the streams are intermittent and at least three have saltings in their estuaries.

Some Effects of Firing

In 1831 an area near the Battery Bay Hills was described as "an extensive country consisting of grass trees and interspersed with some copse." (Plomley, 1966). That description still fits parts of the Wilderness Area. The most obvious thing about the Area is the immaturity of much of its vegetation, about three fourths of it having been fired between 1969 and early 1976. Some parts have been fired twice during that period. Little of the fired parts had mature vegetation at the time of firing because of previous fires. Austral Grasstrees *Xanthorrhoea australis* are now dominant in parts of the Area because the constant firing has suppressed scrub growth. I think that the early description given above is of vegetation affected similarly by firing.

Some of the present day firing is done by fishermen but most is done by the resident Aborigines. The latter told me that firing, by keeping the vegetation short, favours the Brush Kangaroo *Wallabia rufogrisea* which prefers open areas, and allows it to increase its numbers relative to the Wallaby *Thylogale billardieri* which prefers thick scrub (John Mansell and Devony N. Brown, pers. comm.). From about 1900 to about 1948, dogs were used to hunt Brush Kangaroos in the Wilderness Area and the animals were snared as well (E.L. Maynard, W.A. Riddle, John Mansell and Claude B. Mansell, pers. comm.). Hunting, therefore, depended on firing. I think that the frequent firing could have been started in the early nineteenth century by Aboriginal women who hunted Brush

Kangaroo on a large scale on the island before 1831. I think they would have used dogs as they were using them for hunting on nearby Flinders Island in 1830 (Plomley, 1966). Fire was used by Aborigines to effect vegetation change and increase macropod numbers on the Tasmanian mainland (Jones, 1968). I surmise that it might also have favoured some macropods more than others. Even though hunting and snaring have ceased in all but the far west of the island, almost the whole island is still being fired regularly and I believe the use of fire has become a custom with the Aborigines. This firing is probably one of the few Aboriginal practices still being followed in Tasmania.

Lowland Vegetation

Much of the vegetation of the lower country of the Wilderness Area can be divided roughly into that of the dry banks and slopes and that of the damper flats and bottoms.

The main dominants of the dry areas are Silver Peppermint *Eucalyptus tenuiramis* and Austral Grasstree *Xanthorrhoea australis* Large parts of the lowland Silver Peppermint stands have been changed to a mallee gum habit by the firing and these trees send up many small trunks from large rootstocks. I have not seen any young Peppermints in the lowland dry areas. Some Peppermints have been killed by the firing and I think that originally this species would have been much more common. Patches of Austral Grasstrees have died in many places during the last ten years. Seedling Grasstrees were noticed only in the existing stands.

Where only Peppermints are present they remain the dominant species after firing by either shooting from their trunks or regrowing quickly from their rootstocks. Where there are Grasstrees with Peppermints, the dominant species after firing depends on the pre-fire height of the Grasstrees and on whether or not the Peppermints are mallee-like. The taller shrubs are the dominant species in areas which lack Peppermint and Grasstrees.

As an example of a dry area, I will describe a dry slope about 1km. north of Rices River Point, Kents Bay. There the vegetation was about ten years old (fired c. 1966) and the dominant species was Silver Peppermint to 3.6m. high. The understory had Austral Grasstree and the tall shrubs Silver Banksia *Banksia marginata*, Dagger Hakea *Hakea teretifolia*, Tasmanian Teatree *Leptospermum glaucescens*, Dwarf Sheoak *Casuarina pusilla* and Spreading Wattle *Acacia genistifolia*. The many lower shrubs included Wiry Bauera *Bauera rubioides*, Guinea-flower *Hibbertia procumbens*, Swamp Beardheath *Leucopogon esquamatus*, Oval-leaf Pseudanthus *Pseudanthus ovalifolius* and Hairy boronia *Boronia pilosa* var. *laricifolia*. The few herbs included Bogrush *Schoenus turbinatus*, Climbing Sundew *Drosera planchonii*, Common Rapier-sedge *Lepidosperma filiforme* and Slender Bogrush *Schoenus tenuissimus*.

Silver Peppermints were not noticed in the bottoms or on damp flats but Austral Grasstrees extended into some of the drier ones. Rushes and sedges are dominant in parts where there are neither shrubs nor Grasstrees. After firing, the vegetation of all the bottoms and flats is dominated by rushes and sedges, except where Grasstrees are present. Where only shrubs occur, they become dominant again when they outgrow the rushes and sedges.

Next I will describe an area in which shrubs, as they grow older, will be only occasional emergents above the sedge layer. This is the very damp, peaty bottom, with some surface water, on the eastern side of Kents Bay about 2km. east-south-east of the mouth of Rices River. A dense growth of Large-flowered Rapier-sedge *Lepidosperma forsythii* and occasional clumps of Button Bogrush *Gymnoschoenus sphaerocephalus* formed the dominant layer in this area which was fired sixteen months previously (December, 1974). There were only seven species growing under the dominant layer. These were Bogrush *Schoenus carsei* (This species is a new record for Tasmania. I found it first, in north-western Cape Barren Island, in 1970 (MEL, HO).), Pink Swampheath *Sprengelia incarnata*, Slender Twinerush *Leptocarpus tenax*, Soft Twigrush *Baumea rubiginosa*, Forked Sundew *Drosera binata*, Pointed Ricegrass *Tetrarrhena acuminata* and Scented Paperbark *Melaleuca squarrosa*.

A drier, nearby flat had rushes and shrubs as the dominant species. They included Manuka *Leptospermum scoparium*, Pithy Swordsedge *Lepidosperma longitudinale*, Flat Cordrush *Restio complanatus*, Yellow Hakea *Hakea nodosa* and Slender Twinerush *Leptocarpus tenax*. The lower species included Swamp Selaginella *Selaginella uliginosa*, Slender Honey-myrtle *Melaleuca gibbosa* and Common Rapier-sedge *Lepidosperma filiforme*. This vegetation was about four years old, as the area had been fired in about 1972. The shrubs will soon be the dominant species. An adjacent section, not fired for about eight years, had shrubs to about 2.5m. high and only a very occasional rush in the dominant layer.

Unusual Plants

The Wilderness Area has twelve Australian mainland plant species that do not reach mainland Tasmania. For two of the species, Large-flowered Rapier-sedge *Lepidosperma forsythii* (CAN) and Common Fringelily *Thysanotus tuberosus* (MEL), the only Tasmanian recordings are in the Wilderness Area. Six species occur on nearby Flinders Island and have their southernmost Tasmanian occurrence in the Area. These are Furze Hakea *Hakea ulicina*, Oval-leaf Pseudanthus *Pseudanthus ovalifolius* (MEL), Swamp Beardheath *Leucopogon esquamatus*, Pink Bladderwort *Polypompholyx tenella* (MEL), and Pomaderris *Pomaderris affinis* (MEL, AD, CAN). The remaining five species, which also occur just to the south on Clarkes Island, are Banded Greenhood *Pterostylis vittata* (CAN), Fringed Everlasting *Helichrysum baxteri* (CAN), Prickly Couch *Zoisia macrantha*, Horny Conebush *Isopogon ceratophyllus* and Bogrush *Schoenus carsei*. Pomaderris *Pomaderris sieberana* (MEL, AD, CAN) had also been found in the area but I do not know if it reaches the Tasmanian mainland.

The rare Bog Clubmoss *Lycopodium serpentinum* (MEL, AD, CAN), occurs in at least three localities and in one of them is very extensive. Already the Wilderness Area is probably both the Tasmanian and Australian stronghold of the species and I am sure that more occurrences will be found there. This species also occurs in one Cape Barren Island locality outside the Area (MEL, HO). Button Bogrush *Gymnoschoenus sphaerocephalus* occurs in much of the southern half of the Area and is a dominant species in many parts after fires. It is a distinctive feature as the only other Bass Strait record seems to be one small occurence on Flinders Island (Dimmock, 1957). Alpine Heath *Epacris*

paludosa grows in the Area at Victualling Office Bay (only a metre above sea level), at Rooks River and on the higher parts of Mount Kerford. Its only occurrences on mainland Tasmania are on Mount Cameron (Betty Gee, pers. comm.) and on Cape Tourville. Bushy Needlewood *Hakea sericea* is present in the Area and has been found south of this only on Rocky Cape. The Bogrush *Schoenus turbinatus* (MEL, AD, CAN), which is uncommon on the Tasmanian mainland, is widespread on dry banks and slopes in the Area. It is not recorded for any other Bass Strait island.

A few other unusual species are Prawn Greenhood *Pterostylis pedoglossa* (MEL - the only Bass Strait record), Lizard Orchid *Burnettia cuneata* (MEL - known elsewhere in Bass Strait only on King Island), Bushpea *Pultenaea stricta* (MEL, AD, CAN - the only Bass Strait records) and Pigmy Clubmoss *Phylloglossum drummondii* (CAN - elsewhere in Bass Strait only on King and Flinders Islands).

The six endemics recorded so far for the Area are Silver Peppermint *Eucalyptus tenuiramis*, Guitar Plant *Lomatia tinctoria*, Tasmanian Teatree *Leptospermum glaucescens*, *Hakea epiglottis*, *Pimelea nivea* and *Hibbertia hirsuta*.

Recommendation

My plant list for Cape Barren Island now totals just over 540 species. About 300 species occur in the Wilderness Area and I am sure that more will be found there. Most of the Area is marginal agricultural land that has never been considered seriously for farming and there are few tracks in it. It is the largest piece of uncleared land left on the Bass Strait islands and would make a distinctive Wilderness Reserve. To judge by the Australian Conservation Foundation (1975), Tasmania has only four potential minor Wilderness Areas. The Cape Barren Area would be and important addition to Tasmania's natural reserves.

Acknowledgements

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CAPE BARREN ISLAND

TOWARDS A FLORA OF MAATSUYKER IS.

PART I - Introduction and Vascular Plants

A. M. Moscal and G. C. Bratt

Introduction

During visits by A. M. Moscal to Maatsuyker Is. in 1971 and 1976 the opportunity was taken to examine extensively and collect samples of the flora. The collections have since been examined by the authors and others and the preliminary results are recorded herein.

Maatsuyker Is. is situated at approximately 43°39'S, 146°17'E, and is the most southerly substantial extension of the Tasmanian regime (excluding Macquarie Is.). It is about 2.5 x 1.2 km. and reaches a height of 260 m. Rainfall data for the island are as follows - 249 days of rain/year; mean annual rainfall 1200 mm; wettest month July (125 mm) and driest month Feb. (85 mm). Average annual temperatures vary between 8.4°C and 13.9°C with extreme mean values of 17.2°C in January to 6.3°C in August (Bureau of Meteorology, pers. comm.). High winds and salt spray are factors affecting the vegetation and mist often shrouds the higher elevations.

Geologically it appears to be composed almost entirely of metamorphosed quartz schists, faulted and folded. Sands and quartzite and remnants of conglomerate occur.

The northern end of the Island has predominantly shallow skeletal soil alternating on inclines with sandy loam. The remaining two-thirds of the Island has sandy soils intermixed or overlaid by humus.

Mutton birds are probably the largest group of inhabitants numerically (1/2 million birds) (Fleming, 1976) and their burrowing results in some erosion and land slips.

The Island has suffered at the hands of man from early times. For example, Flinders in 1798 (Lord, 1921) noted that the vegetation on the island had been burned, presumably by visiting natives. Some fires occurred before 1910 in connection with clearing operations, but apparently no man-made or wild fires have affected the vegetation since.

Some clearing has been done to give access to the lighthouse, residences, and for grazing purposes. These clearings are the major areas affected by introduced species, the blackberry being particularly widespread possibly as a result of suckering and blackbird activity. Perhaps both these non-indigenous species (the blackbird and the blackberry) should be eradicated.

Vascular Plants

The vegetation is predominantly *Leptospermum scoparium*, *Melaleuca squarrosa* and *Banksia marginata*. At about 15 m. above sea level, the dominant vegetation is stunted and wind pruned, but at higher elevations or in more sheltered areas it may reach 3.5 m. to 6 m. in height.

The higher plant flora is listed in Table 1 and further detailed information is given below.

a. *Pittosporum bicolor* - Several trees with unusual leaves were noted and these are being further examined.

b. *Blandfordia punicea* - The stronghold for this species is on western slopes. The form observed here is more robust than that observed on the mainland. On the plateau and ridges in areas of native trees, another variant of this plant was common but appeared to be reluctant to flower.

Further examination is required to determine if these represent separate species or environmental variants

c. *Westringia, Coprosma, Pimelea, Helichrysum* and *Olearia* sp. are more abundant on the Island than on the West and the South West coasts of Tasmania and this is possibly due to the infrequency of fires on the Island.

No attempt has been made to study algae, fungi, mosses or hepatics.

Part II will contain information on ferns, clubmosses and lichens.

The assistance of Dr. W.M. Curtis, Mr. D.I. Morris and Mr. M.J. Brown is gratefully acknowledged.

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Table 1

HIGHER PLANTS OF MAATSUYKER IS.

Genus & Species	Family	Status See foot note	Habitat, etc.
Acacia verticillata	Leguminosae	N	Abundant at all levels
Anopterus glandulosus	Escalloniaceae	E	Common but localized
Apium prostratum	Umbelliferae	N	Mutton bird rookeries
Archeria eriocarpa	Epacridaceae	E	On borders of shrub-eries. More common than in Tas.
" *hirtella*	"	"	" " " " " " "
Aristotelia peduncularis	Elaeocarpaceae	E	Individual plants in damp areas from mid top of Main Ridge
Banksia marginata	Proteaceae	N	Dominant plant

Genus & Species	Family	Status See foot note	Habitat, etc.
Billardiera longiflora	Pittosporaceae	N	Tangled network in shady places
Blandfordia punicea	Liliaceae	E	On poor soil and exposed areas. See text.
Bromus diandrus	Gramineae	I	Open habitat
Caladenia sp.	Orchidaceae	-	Rare, not presently fully identified
Carex appressa	Cyperaceae	N	Open habitat
Carpobrotus rossii	Ficoideae	N	Salt spray areas
Cenarrhenes nitida	Proteaceae	E	Rare
Clematis aristata	Ranunculaceae	N	Found with *Epacris impressa* and *Gahnia grandis*
Colobanthus sp.	Caryophyllaceae	E?	Open habitats. Appears to be distinct species
Coprosma quadrifida	Rubiaceae	N	Abundant, see text.
Correa lawrenciana	Rutaceae	N	Abundant in open areas along cliff tops
" *backhousiana*	"	E	" " " " " " "
Corybas dilatata	Orchidaceae	N	Well distributed but localised in or near open areas
Cotula coronopifolia	Compositae	N	Open habitat
" *longipes*	"	N	" " "
Crassula peduncularis	Crassulaceae	N	" " "
Cyathodes abietina	Epacridaceae	E	Abundant in open areas along cliff tops
" *juniperina*	"	N	" " " " "
Dianella sp.	Liliaceae	N	Open habitats
" *tasmanica*	"	N	Mutton bird rookeries
Disphyma australe	Ficoideae	N	Salt spray area
Drimys lanceolata	Winteraceae	N	Abundant at all levels
Epacris impressa	Epacriaceae	N	Form as in high rainfall and alpine habitats in Tas.
Epilobium billardierianum	Onagraceae	N	Open habitats
Eriochilus cucullatus	Orchidaceae	N	Open areas
Eucalyptus nitida	Myrtaceae	N	Only 8 specimens - possibly due to absence of fire
Exocarpos strictus	Santalaceae	N	Abundant at all levels
Gahnia grandis	Cyperaceae	N	Found with *Epacris impressa* and *Clematis sp.*

Genus & Species	Family	Status See foot note	Habitat, etc.
Haloragis teucrioides	Haloragaceae	N	Open habitats
Helichrysum paralium	Compositae	N	Abundant, see text
Hordeum leporinum	Gramineae	I	Open habitats
Lepidium foliosum	Cruciferae	N	Mutton bird rookeries
Leptospermum scoparium	Myrtaceae	N	Dominant plant
Leucopogon collinus	Epacridaceae	N	Abundant along cliff tops
" *parviflorus*	"	N	" " " " "
Luzula flaccidum	Juncaceae	-	Open habitats
Melaleuca squarrosa	Myrtaceae	N	Dominant plant
Microtis biloba	Orchidaceae	N	Open areas, rare
Monotoca glauca	Epacridaceae	N	Common in all habitats
Muehlenbeckia gunnii	Polygonaceae	N	Tangled network in shaded places
Olearia phlogopappa	Compositae	N	Abundant, see text
" *viscosa*	"	N	" " " "
Oxalis corniculata	Oxalidaceae	N	Open habitat
Pelargonium australe	Geraniaceae	N	" "
Phylloglossum drummondii	Lycopodiinae	N	Open habitat
Pimelea drupacea	Thymelaeaceae	N	Abundant, see text
Pittosporum bicolor	Pittosporaceae	N	Abundant at all levels, see text
Plantago triantha	Plantaginaceae	N	Open habitat
Poa annua	Gramineae	I	" "
" *poiformis*	"	N	" "
Pomaderris apetala	Rhamnaceae	N	Rare
Pterostylis pedunculata	Orchidaceae	N	Open area
Pultenaea dentata	Papilionatae	N	Open habitat
Rhagodia baccata	Chenopodiaceae	N	Mutton bird rookeries
Rubus fruticosus	Rosaceae	I	Introduced, see text
Salicornia blackiana	Chenopodiaceae	N	Salt spray area
Scirpus cf. wakeieldianus	Cyperaceae	N	Open habitat
Senecio lautus	Compositae	N	Mutton bird rookeries
Sprengelia incarnata	Epacridaceae	N	Uncommon, localized
Stylidium graminifolium	Stylidiaceae	N	Abundant at all levels and habitats. Similar to south coast type
Tetragonia implexicoma	Ficoideae	N	Mutton bird rookeries
Thelymitra megacalyptera	Orchidaceae	N	Open area

Genus & Species	Family	Status See foot note	Habitat, etc.
Thelymitra pauciflora	Orchidaceae	N	Open area
Urtica incisa	Urticaceae	N	Mutton bird rookeries
Westringia brevifolia	Labiatae	E	Abundant in open areas along sliff tops, see text
" *rigida*	"	N	" " " " "
Viola hederacea	Violaceae	N	

Footnote

Abbreviations used are :

I = Introduced
E = Tasmanian endemic
N = Tasmanian native

TRAGEDY IN A COFFEE-JAR!

Elizabeth Turner
Tasmanian Museum

The ways of spiders are a constant source of surprise to me but never have I been angered by the actions of an individual until a recent event which took place in a coffee-jar.

A pregnant White-tailed House spider, *Lampona cylindrata*, was donated to the Tasmanian Museum by a Geeveston resident. I housed the mother-to-be in a jar, with a twig or two and a wet cotton-ball from which to drink. Despite the loss of a leg during her initial capture, she seemed healthy and ate several small moths and a beetle when these were offered to her.

A month after her arrival she was seen to have spun a thin, white sheet of silk over the bottom of the jar. Salmon-pink eggs, wrapped in a membrane, were being squeezed out through the reproductive aperture on the ventral surface of her abdomen. Laying lasted about 20 minutes until an egg-mass, the size and shape of a "Smartie" chocoalte-bit, had been produced and placed on the silken sheet. Without pause she commenced to anchor and cover the membrane-enclosed eggs with fine, silk threads until a pinkish-white egg-sac was formed. Only then, after three hours of work, did she stop to rest.

I had never before seen a *Lampona* lay her eggs and was delighted to have witnessed this instinctive maternal act. Imagine my horror, one hour later, whenI looked again and discovered that her "rest" also included lunch! She had eaten all her eggs! I have watched many other species form egg-sacs, with no harm befalling the latter at any stage, so I was particularly dismayed to see such callous behaviour. I can only conclude that either the moths were not enough and she was still hungry, or

that the abnormal surroundings prompted her action, as this type of cannibalism is not normal amongst spiders. Some species will eat the young spiders after they emerge from the egg-sac while the young, in turn, often eat each other. Adults, too, sometimes attack other adults, of their own or different species, but egg-eating is rare and must happen only for an ulterior reason. Most female spiders are very defensive about their egg-sacs and usually never leave them except in times of stress.

As a result of this little tragedy, I will try to successfully feed and house my next pregnant spider!

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COMMUNAL EGG-LAYING IN THE THREE-LINED SKINK *Leiolopisma trilineata*

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National Parks and Wildlife Service, Hobart.

On 24 January, 1977, I collected 64 eggs of *Leiolopisma trilineata* from a single nest on the west coast of Maria Island. The nest was located under a rock embedded in the surface of a grass verge with a northern aspect just above the supra-littoral zone. The eggs were closely-packed in the nest - a chamber at the end of a tunnel which terminated under the rock about 3 cm below the surface of the soil.

The mean egg length was 1.43 cm (1.20 cm to 1.71 cm) and the mean egg breadth was 1.03 cm (0.89 cm to 1.19 cm). The relationship between the length (x) and breadth (y) of eggs is described by $y = .39x + 0.47$ ($r = 0.65$, $P >> 0.01$).

At the time of collection (about noon), no Three-lined Skinks were seen in the vicinity of the nest, although a few Spotted Skinks *Leiolopisma ocellata* were observed in the area. The eggs were incubated at 30°C to 35°C in moist soil and hatched to confirm their identity. All but one of the eggs subsequently hatched - the first on 10 February and the last on 18 February, 1977. The lizards hatched by tearing their egg shells and escaping to the surface of the soil. Each animal possessed a bright orange throat-patch. Live hatchlings were released each day as they hatched; but twelve died from over-heating and were kept in 70% ethyl alcohol solution for subsequent study by the National Parks and Wildlife Service.

The mean length of the preserved specimens is 4.88 cm (4.60 cm to 5.05 cm) and the mean snout to vent length is 2.32 cm (2.20 cm to 2.35 cm). The number of rows of scales around the

abdomen of these specimens ranges from 26 to 29 but seven specimens carry 28 scale rows. The adpressed legs either do not touch, or barely touch, and there are 18 to 21 smooth sub-digital lamellae on the fourth hind toes of these specimens. All the specimens carry five supraciliary scales over each eye. Other features of these specimens are consistent with those in the description of *L. trilineata* by Cogger(1975).

The largest number of eggs previously found in one nest of *L. trilineata* is 15 (mean clutch size 5.5 eggs) and females of this species were considered not to lay eggs communally (Rawlinson, 1974). *Leiolopisma delicata* is the only other species of skink in Tasmania which is oviparous. This species is known as a communal egg-layer and nests containing up to 110 eggs of this species have been found (Rawlinson, 1974). It is also apparent that female *L. trilineata* lay their eggs communally but how commonly this occurs is not known. The present observations suggest that eleven or twelve females of *L. trilineata* may have laid all their eggs in the nest on Maria Island.

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ADDITIONAL TYPE SHELLS FROM TASMANIA IN THE SOUTH AUSTRALIAN MUSEUM

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South Australia 5000

In an earlier paper (Macphail & Zeidler 1977), we listed type specimens forming part of the W.L. May Collection of Tasmanian shells in the South Australian Museum, Here, we complete the catalogue of type specimens of Mollusca from Tasmania held by this museum.

The specimens listed in Section A are from the Ashby and Verco Collections, for the most part shells collected in Tasmania but described by South Australian conchologists early th century. Some, e.g. May's species, were sent in exchange f th Australian shells. In most cases, the original as been preserved. Otherwise the opinion concerning type status of the shell(s) is that of Bernard C. Cotton, (ator of Molluscs at the South Australian Museum from 1934 to 1962.

The shells are arranged alphabetically in families under the original published name. The reputed type status of each shell is given, but, where dubious, is followed by a question-mark. Numbers in parenthese refer to May's (1921) *Checklist*. D registration numbers refer to the Register of Mollusca at this museum.

Additional "Cotypes" of species referred to in the earlier paper are listed in Section B.

NATIONAL MUSEUM 17 FEB 19

Section A

CREPIPODA

Callistochitonidae	*Calliston antiquus mayi* Ashby, 1919. Holotype (248) D12550.
Chitonidae	*Chiton lineolatus* Blainville, 1825. Part of type series? (237) D10237.
	Chiton oruktus Maughan, 1900. Paratype (266) D12383.
Cryptoconchidae	*Acanthochiton macrocystialis* Ashby, 1924. Holotype D10704.
	Acanthochiton macrocystialis Ashby, 1924. Paratypes D12563.
	Acanthochiton spongialis Ashby, 1923. Holotype D13733.
Ischnochitonidae	*Ischnochiton atkinsoni brunyensis* Ashby, 1920. Holotype ? (233) D11966.
	Ischnochiton iredalei kingensis Ashby & Hull, 1923. Holotype D13731.
	Ischnochiton (Haploplax) mayi viridis Ashby, 1920. Holotype (238) D11972.
Lepidopleuridae	*Lepidopleurus profundus* May, 1923. Holotype + Paratype D12533.
Plaxiphoridae	*Kopionella matthewsi intermedia* Ashby, 1927. Holotype ? D12115.
	Kopionella tasmanica Ashby, 1920. Holotype (251) D12156.

PELECYPODA

Bullinidae	*Tasmadora sorellensis* Cotton, 1943. Holotype D14132.
Mytilidae	*Arcoperna recens* Tate, 1896. Holotype. (63) D13040.
	Arcoperna recens Tate, 1896. Paratypes (63) D15607.
Nuculidae	*Pronucula cancellata* Cotton, 1930. Paratypes D15021.
	Pronucula mayi Iredale, 1930. Holotype D15109.
Philobrydae	*Philobrya fimbriata* Tate, 1898. Holotype (25) D13149.

GASTROPODA

Ancylidae	*Gundlachia beddomei* Petterd, 1887. Holotype (890) D5370.
	Gundlachia petterdi Johnston, 1878. Holotype (890) D5371.

Buccinidae	*Cantharus kingicola* Tate & May, 1900. Holotype ? (793) D15883.
Charopidae	*Helix bischoffensis* Petterd, 1879. Holotype (933) D3251.
Liotiidae	*Cyclostrema crebriculpta* Tate, 1899. Holotype (356) D13402.
	Cyclostrema porcellana Tate & May, 1900. Holotype ? (362) D16062. Paratypes D15723.
	Liotia densilineata Tate, 1899. Holotype ? (376) D13412. Paratype D15722.
	Liotia mayana Tate, 1899. Holotype (377) D13413.
Littorinidae	*Bembicium melanostoma* Gmelin, 1791. Neotype (407) D14590.
Marginellidae	*Marginella erma* Cotton, 1944. Holotype D14986.
	Marginella freycineti May, 1916. Paratypes (661) D16088.
	Marginella gracilis May, 1911. Paratypes (677) D15815, D16087.
	Marginella mayii Tate, 1900. Holotype (678) D13523.
	Marginella subauriculata May, 1916. Paratypes (690) D16090, D16091.
	Marginella thouinensis May, 1916. Paratypes (692) D16089.
Melanellidae	*Eulima mayii* Tate, 1900. Holotype ? (983) D13462.
Olividae	*Ancillaria petterdi* Tate, 1893. Holotype ? (643) D14123.
Omalogyridae	*Cyclostrema mayii* Tate, 1899. Holotype ? (383) D13426.
Patellidae	*Nacella tasmanica* Tate & May, 1900. Syntypes (---) D16068.
Pyrmidellidae	*Odostomia crassicosta* May, 1916. Paratype (961) D16072.
	Odostomia mayii Tate, 1898. Holotype (963) D13467.
Rissoidae	*Rissoa pertranslucida* May, 1913. Paratype (?) D16064.
	Rissoina semisculpta Tate, 1899. Holotype (?) D14437.
Skenopsidae	*Cyclostrema charopa* Tate, 1899. Holotype (367) D14111.
Thaididae	*Purpura baileyana* Tenison-Woods, 1881. Holotype ? (856) D13489.
Turbinidae	*Turbo simpsoni* Tenison-Woods, 1877. Paratypes (349) D9869.
Turridae	*Drillia schoutanica* May, 1911. Paratypes (743) D16030.
	Drillia subviridis May, 1911. Paratype (738) D16029.

Section B

GASTROPODA

Capulidae	*Roya devexus* May, 1961. (519) D16069.
Liotiidae	*Cirsonella translucida* May, 1916. (353) D16063.
	Crossea consobrina May, 1916. (569) D15719.
Littorinidae	*Risellopsis mutabilis* May, 1909. (409) D16065
Marginellidae	*Marginella altilabra* May, 1911. (647) D16086.
	Marginella auriculata May, 1916. (693) D16084.
	Marginella caducocincta May, 1916. (650) D16083.
	Marginella connectans May, 1911. (653) D16082.
	Marginella gabrieli May, 1911. (663) D16077.
	Marginella gatliffi May, 1911. (664) D16085.
	Marginella hedleyi May, 1911. (667). D16076.
	Marginella inaequidens May, 1913. (668) D16078.
	Marginella indiscreta May, 1911. (671) D16080.
	Marginella schoutanica May, 1913. (688) D16081.
	Marginella vercoi May, 1911. (696) D16079.
Mitridae	*Vexillum pumilo* May, 1916. (783) D16067.
Pyramidellidae	*Odostomia occultidens* May, 1916. (965) D16073.
Pyrenidae	*Mitromorpha multicostata* May, 1911. (834) D16075.
Rissoidae	*Aclis columnaria* May, 1911. (484) D15720.
	Amphithalamus pertumida May, 1916. (454) D16070.
	Epigrus semicinctus May, 1916. (465) D16071.
	Rissoa schoutanica May, 1913. (421) D16074.
Scissurellidae	*Scissurella ornata* May, 1909. (273) D9675.
Trochidae	*Euchelus profundior* May, 1916. (342) D9656.
Turridae	*Daphnella pagoda* May, 1911. (766). D1911.
	Hemipleurotoma tasmanica May, 1911. (714) D15921.

Taranis aculeata May, 1916. (751) D16043.
Taranis microscopia May, 1916. (758) D16042.

SCAPHAPODA

Siphonodentaliidae *Cadulus spretus* Tate & May, 1900. (1048) D16002.

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MEASUREMENTS OF TREES AND SHRUBS IN WESTERN TASMANIA

S.J. Berrigan
Queenstown

While working in West Coast bush in the past few years I have come across several impressively large specimens of trees and shrubs. A few of these I have measured and the details are presented here.

Note: G.B.H. = Girth at Breast Height, 1.3 m (4ft 3in) above ground level.

D.B.H. = Diameter at Breast Height, 1.3 m (4ft 3in) above ground level.

1.	Species	*Phyllocladus asplenifolius*, Celery-top Pine.
	Measurement	G.B.H. 4.22m (13ft 10in)
	Location	Near Luina, about halfway between the Whyte River and Betts Track and about 2km (1.5ml) south of the Corinna Road.
	Date	February, 1976.
	Accompanied by	M. Miller and R. Walters.
2.	Species	*Anodopetalum biglandulosum*, Horizontal.
	Measurements	Height 17m (56ft) D.B.H. 42cm (1ft 5in)
	Location	Headwaters of the Spence River, about 1km (0.6ml) west of the Franklin River Road.

	Date	September - November, 1976.
	Accompanied by	P.J. Greatpatch.
3.	Species	*Cenarrhenes nitida*, Native Plum (Port Arthur Plum).
	Measurements	Height 16m (52ft) D.B.H. 38cm (1ft 3in)
	Location	Headwaters of the Spence River, about 1km (0.6ml) west of the Franklin River Road.
	Date	September - November, 1976.
	Accompanied by	P.J. Greatpatch.
4.	Species	*Acacia mucronata*, (Willow Wattle).
	Measurement	D.B.H. 49cm (1ft 7in)
	Location	On the Lefroy Ridge, about 0.5km (0.3ml) east of the Corinna Track, south of the Pieman River.
	Date	September - November, 1976.
	Accompanied by	P.J. Greatpatch.
5.	Species	*Monotoca glauca*.
	Measurements	Height 10m (33ft) D.B.H. 30cm (1ft)
	Location	On the Lefroy Ridge, about 0.5km (0.3ml) east of the Corinna Track, south of the Pieman River.
	Date	September - November, 1976.
	Accompanied by	P.J. Greatpatch.
6.	Species	*Athrosperma moschatum*, Sassafras.
	Measurements	Height 36m (118ft) G.B.H. 3.27m (10ft 9in)
	Location	Bernafai Ridge, about 3km (2ml) south-west of Corinna.
	Date	January, 1977.
	Accompanied by	S. Hesketh, J. Andrews and R. Reid.
	(Note: This particular specimen of Sassafras has enveloped a tree fern).	
7.	Species	*Nothofagus cunninghamii*, Myrtle.
	Measurement	G.B.H. 8.46m (27ft 9in)
	Location	Bernafai Ridge, about 3km (2ml) south-west of Corinna.
	Date	January, 1977.
	Accompanied by	S. Hesketh, J. Andrews and R. Reid.

It may be of interest to note that the Myrtle with the greatest known girth (G.B.H. 13.72m or 45ft) is recorded in the Australian Forestry Journal of April, 1927. It was measured by Mr. J. Reed, Chairman of the National Parks Committee of Victoria, at the junction of Cumberland and Cora Lynn Creeks, near Marysville, in 1926. The tree was destroyed in the 1939 bushfires.

The above measurements are presented with the intention of adding to the nucleus of reliable measurements of trees and shrubs already published. It is highly likely there are still many specimens of the species mentioned above with greater dimensions than those recorded, which await accurate measurement.

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HISTORY IN A TASMANIAN CHITON

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Few of the historic biological specimens collected by the early expeditions exploring the Australian coastline are located outside museums in London and Paris. In this paper we trace the history of one of the few, a shell in the South Australian Museum of *Ischnochiton lineolatus* (Blainville, 1825).

This chiton, originally described as *Chiton lineolatus*, was taken on King Island in 1802 by Francois Péron, zoologist (Plate 1) and Charles Lesueur, artist with the (French) *Baudin* Expedition [1-4]. The shell is still legibly marked on the inside in faded black ink "Ile King", presumably Péron's handwriting (Plate 2). The history of this chiton reflects that of early zoological taxonomy in Australia.

The Baudin Expedition - two corvettes, *Le Géographe* and *Le Naturaliste*, and a schooner purchased in Sydney, all under the command of Nicolas Baudin - reached King Island on 6 December, 1802. Both Baudin's and Péron's journals describe the visit, made during the Napoleonic Wars between France and Britain [5-6]. It was during this stopover that the captain and crew of the *Cumberland* (sent from Sydney by Governor King to "watch" the French) first asserted the English claim to Tasmania [7-10] - by "hoisting the colours" (upside down) on a tree at the rear of the French encampment at Sea Elephant Bay*.

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* An act considered childish rather than hostile by the French. It did not deter the *Cumberland's* Captain from requesting (and receiving) from Baudin supplies omitted from the *Cumberland* due to her rushed departure - items ranging from gunpowder and spare sails to needles and thread.

With war a hemisphere away, it is perhaps not surprising that domestic rather than international rivalries are more apparent in the accounts of the voyage. As with Darwin and Capt. Fitzroy on the *Beagle* some 30 years later, the different demands of navigation and science brought Baudin and Peron into conflict[+].

There can be little doubt as to Peron's enthusiasm for the exploratory side of the natural sciences. Molluscs were a particular favourite. Already, in pursuit of these he had become near drowned, then lost, on the Bernier and Dorre Islands off the West Australian coast. In July, 1801, it was "Citizen Peron, whose extreme enthusiasm leads him to undertake everything without thought for the dangers to which he is exposing himself"[11]. By March, 1803, Peron's single-mindedness when on shore was somewhat less appreciated"... Citizen Peron, the most thoughtless and most wanting in foresight of everyone on board"[12]. The fate befalling the earlier La Perouse Expedition[13] exemplifies the then ever present danger of ships being driven aground if kept at anchor too long in exposed, storm-prone waters such as around the Bass Strait Islands.

Peron and the other French scientists were landed at Sea Elephant Bay on 10 December "complete with their knowledge and baggage for these gentlemen never move without pomp and magnificence", leaving Baudin "extremely dissatisfied that the whole lot of them had not left on the *Naturaliste*"[14] (sent back to France with the expedition's sick crew on 8 December). Despite rainswept conditions that were to continue for the duration of the 15-day stay, Peron was as usual enthusiastic and used the time on shore fully, "It is especially in molluscs, in worms and in zoophytes that King Island offers to the observer, treasures so to speak inexhaustible: indeed, despite the violent storms that were prevalent in these latitudes during our stay there, I managed to procure 180 unknown species of these three classes of the animal kingdom"[15] - including the *Isahnochiton lineolatus*, suggested to have been found washed up on the strand after a storm[16].

Meanwhile, on-shore gales and the loss of two anchors had three times forced Baudin on the *Geographe* to put to sea and tack as best as possible in Bass Strait. These manoeuvres left the scientists on shore dangerously short of food and finally dependent on English sealers for sustenance. Peron's interest in molluscs became more immediate: "our foodstuffs were exhausted .... the tent torn to shreds and overturned by gusts of wind, were no longer sufficient to protect us from the showers which overwhelmed us day and night....waves broke in such violence along the shore that it would have been impossible to go and look for shells which alone would have been able to nourish us"[17].

[+]Peron's journal was translated into English some 165 years before that of his commander. His description of Baudin is therefore well publicized, but not, in our opinion, just. The interested reader is referred to the Foreword by J.P. Faivre in Baudin (1801-3) and to the remarkably perceptive private letter sent by Baudin to Governor King (Appendix D in Micco 1971). Baudin's "only two genuine friends" on the voyage were the zoologist-in-chief, Rene Mauge, and the head gardener, Anselme Riedle (Baudin 1801-3, p.340). Both men had died by the time of the King Is. visit. Baudin's journal contains numerous references to excursions made with them, observations on natural history and drawings of interesting objects found. Undeservedly, the journal remains a little used source in Tasmanian natural history and anthropology.

Abating seas allowed the 'rescue' of the French scientists on 24 December. Still not one to waste any opportunity for collecting when on shore, Peron, "seeing nothing but molluscs at every step...amused himself by missing the first boat"[18]. Predictably, all this strained further the relationship between Peron and Baudin[+] and no doubt was behind Baudin's curiously acerbic summation of the stopover" "Elephant Bay is good only for ruining shipowners...Our scientists...have not had much luck. Fifty-five new plants are all that we are taking away, for I do not count a few poor shells and other small objects"[19].

With gales again expected, the Baudin Expedition set sail on Christmas Day to return to France via the South and West Australian coasts and Mauritus. The chiton fauna of King Island was to remain uninvestigated for another 120 years - until 1922 when two conchologists, W.L. May and A.F.B. Hull, independently and by chance collected on the island within a fortnight of each other[20-21].

Baudin died of tuberculosis at Mauritus on 16 September, 1803. Alone of all the naturalists accompanying Baudin, Peron completed the 3½ year voyage. After his spirited defence of the success of the expedition, he was commissioned to write both the official history and zoology of the voyage. A few zoological articles had been published before the first volume of the History appeared. Before the second volume was prepared, Peron too was dead, leaving a collection of over 100,000 specimens, some 2500 new to science, to be described by others[22]. This was worked on over the next 20 years by the malacologist Henri Blainville and the great systematicist Jean Baptiste Lamarck and the collection housed in the Museum d'Histoire Naturelle in Paris.

By the 1840's, the Australian fauna was being studied by naturalists, at least temporarily resident in Australia. Observations could now be carried out over long periods and wide areas. By the first world war, the chiton fauna had largely been collected through the efforts of men such as R. Gunn, J. Milligan, J.E. Tenison-Woods, F.E. Mawle and W.L. May in Tasmania and W.T. Bednall, J. Brazier, E.H. Matthews, W.G. Torr, C. Hedley, J.C. Verco, E. Ashby, A.F.B. Hull and T. Iredale on the mainland. Due to poor communication, many species had been discovered and named several times and, sometimes, the same name was used for completely different species. Varieties were considered separate species by some and *vice versa* by others. With taxonomic chaos ensuing, it became increasingly necessary to locate and compare the specimens on which each species was based.

[+]Peron's suggestion (Micco, 1971, p.13) that Baudin was indifferent to their fate would appear to be pique. Baudin was aware that his scientists would be lacking in supplies and, albeit belatedly, risked the weather to return to the Sea Elephant Bay anchorage. He also promptly reimbursed the English sealers for the provisions supplied.

The description of *Chiton lineolatus* and a related species *C. elongatus* had been published by Blainville in 1825[23-24]. However Blainville's descriptions predated the requirement that a specimen be designated as *Type* for each new species defined and the actual shells used were long ago replaced without special designation in the Paris Museum collections. Worse still, these collections became mixed, the locality data confused and Blainville's material concealed under mis-descriptions by an erratic malacologist, A.T. de Rochbrune, in the late 19th century[25-26]. By 1901, it was no longer possible to recognise from Blainville's 8 line description any known Tasmanian chiton: *Chiton lineolatus* became " = *Chiton* ? sp., unrecognisable"[27].

In 1916 Iredale and May located an *Ischnochiton* specimen in the British Museum labelled "*Chiton contractus auctt.*" (Reeve, 1847) for which Blainville's description of "*lineolatus*" was "absolutely applicable"[28]. Consequently they revived the name *Ischnochiton lineolatus* (Blainville, 1825) for this shell, discovering in the process that it was 'identical' to a yet another Australian chiton named "*Ischnochiton contractus* by an American, H.A. Pilsbry, in 1895, but different from *I. contractus* of Reeve, 1847. Two years later, P, Dupuis, a Belgian ex army officer working in the Paris Museum, identified Blainville's "*lineolatus*" with a different Australian chiton again, *I. crispus*, Reeve, 1847. He therefore renamed Iredale and May's "*lineolatus*" as *I. iredalei* Dupuis, 1918[29]. This view was supported by the South Australian researcher, E. Ashby who split Reeve's (1847) species *Ischnochiton crispus* into 4 species including a "*lineolatus*" Blainville, 1825. As in H.G. Well's short story of rivalry between two taxonomists working on the same animal group, "The Moth" (pp.302-304)[30], the camaraderie of earlier collecting days became submerged by charge and counter-charge in the literature[31-36] and obscured by the entry of *Chiton elongatus* Blainville, 1825 into the barbed debate and shifting synonomies.

When describing *Chiton lineolatus*, Blainville had distinguished it from *C. elongatus* "founded upon many specimens in the Paris Museum"[37]. Thus if Blainville's "*elongatus*" could be identified in the Paris Museum collection, then the identification of his "*lineolatus*" would follow by the processes of elimination. Two camps emerged: Iredale and Hull identifying Blainville's "*elongatus*" with one morph of *Ischnochiton crispus*, Reeve, 1847 and therefore Blainville's "*lineolatus*" as a species distinct from Reeve's "*crispus*": Ashby, Dupuis and the Paris Museum's director identifying Blainville's "*lineolatus*" with Reeve's "*crispus*" and the "*elongatus*" as possibly *Ischnochiton subviridis*, Iredale and May, 1916! but more likely now unrecognisable.

Ashby, a wealthy collector, took the logical if expensive step of going to the Paris Museum - with the result that the controversy became centred around whether or not the chitons in this museum purportedly collected by Peron and Lesueur and identified by Blainville were correctly labelled after Rochebrune's attentions.

Although subsequent taxonomic judgement has supported Iredale and Hull [38], neither side acquiesced and the controversy died with the main proponents, perhaps then only having been of interest to them. What was gained was the return to Australia of several of the chitons collected by Péron and Lesueur, donated by Dupuis to Ashby [39].

Thus, amongst the specimens of *Ischnochiton lineolatus* (Blainville, 1825) - a chiton common and plentiful on ocean reefs and bays on the South-West and South Australian, Victorian and Tasmanian coastlinds - in the South Australian Museum is one of the first molluscs ever to be collected from Tasmania in the interests of science.

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PLATE 1

Francois Péron

PLATE 2

Inscribed shell of
Ischnochiton lineolatus
Blainville 1825

ARCHAEOLOGICAL INVESTIGATION IN THE DERWENT RIVER ESTUARY SOUTH-EAST TASMANIA

ALUM CLIFFS TEST EXCAVATION INTERIM REPORT

Jim Stockton

National Parks and Wildlife Service, Hobart.

The Alum Cliffs excavation site is situated on the top of a small cliff between the north-east end of Kingston Beach and Bonnet Point. The grid reference is 273416 on the Derwent 8312 sheet published by the Lands Department. The site is site number 20 in the Tasmanian Aboriginal Sites Card Index. (The Card Index is held by National Parks and Wildlife Service, Hobart). The Alum Cliffs site is an open shell midden deposit typical of the Derwent estuary.

A salvage excavation was carried out for a number of reasons. Damage to the deposit had been caused by erosion, rabbit burrowing, and digging in the past. In 1975 further damage occurred when a walking track was cut into the sloping surface of the deposit.

The excavation demonstrated that the midden deposit is of significantly different composition to three previously excavated midden sites further upstream on the River Derwent. These excavations were by Sigleo at Old Beach, Dr. R. Vanderwal at the Bedlam Walls rock shelters (sometimes called the Shag Bay rock shelters) and Dr. A. Wallace at Fishers Hill, inland from Bedlam Walls.

The Old Beach excavation by Sigleo found two hearth features which were dated by radiocarbon. Hearth I gave dates of 5800 ± 130 B.P. (Before Present) (SUA-306) on charcoal and 5600 ± 100 B.P. (SUA-307) on shell remains of *Mytilus planulatus*. Hearth 2 gave a radiocarbon age on charcoal of 1960 ± 105 B.P. (SUA-308) (Sigleo 1975: 302). The Bedlam Walls (Shag Bay) rock shelter excavation by Vanderwal gave dates of 5300 ± 110 B.P. years for the bottom of the deposit and 4720 ± 120 B.P. for the top of the deposit (pers. comm.). The Fishers Hill (Shag Bay) excavation by Wallace gave dates of 5420 ± 85 B.P. (ANU-1090A) and 5890 ± 90 B.P. (ANU-1090B) (pers. comm.). Thus the dates for these sites cluster around the 5,000 B.P. year mark.

At the time the sea level may have been lower as the shellfish types found in these upstream sites are brackish types (Vanderwal, per. comm.). It was hoped that the Alum Cliffs site would be of a similar antiquity but that it would represent a fully marine resource zone. The latter was borne out by the results. The sea bed at Alum Cliffs was checked with a boat echo sounder and found to drop off steaply to a depth of 10 m at 100 m from the shore, deepening to 24 m at 400 m from the shore. It was calculated hat this would be sufficient depth to accomodate the lower sea level postulated by Vanderwal.

One 1 m x 1 m pit was excavated. The top 5 cm was stripped off as intact clumps and placed to one side. This material was used to resod the site after excavation. After the "overburden" was removed the deposit was excavated in artificial 5 cm spits as depositional stratigraphy was not clear during excavation. At a depth of 45 cm the excavation area was reduced to 50 cm x 100 cm and continued at this size through the base of the deposit to bedrock at 50 cm depth. The excavated material was first sieved through a ½" then a ¼" screen. All bone and stone was removed and bagged separately. Of the shell remaining in the ¼" sieve a random sample was taken. This sample was used to estimate the relative proportions of shellfish species present (see Table). Unsieved samples of one bucketful were taken for each spit. Where concentrations of charcoal suitable for C14 dating were found a carbon sample was taken. The sample from the lowest spit has been submitted to the Sydney University Radiocarbon Laboratory for dating. This sample (SUA-599) gave an antiquity of 3875 $\pm$ 160 B.P. Only one scallop shell was recovered. The shell has a hole in the centre which does not appear to have formed naturally. This was the only scallop shell found in the excavation. Hiatt (1967) deals with accounts of scallops as a food.

Preliminary Conclusions

In comparison with the excavations carried out by Wallace and Vanderwal, four striking differences emerge. Firstly, although not apparent during excavation, when a section was cut, the Alum Cliffs deposit was clearly and strikingly stratified in a manner that was not apparent in Bedlam Walls and Fishers Hill sites. Secondly, the species present appear to be wholly marine in habitat. Thirdly, no animal bones were found at the other sites with the exception of a bone artifact found by Vanderwal. At Alum Cliffs several fragments of animal bone were recovered. Fourthly, the scallop shell with a central hole was an unprecedented find. I would argue that the point of major interest is the pattern of change in the relative proportions of the different shellfish types present.

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TABLE OF MINIMUM NUMBERS FOR SHELLFISH SPECIES, ALUM CLIFFS

PIT B

SPIT	SPECIES				
	Mytilus sp. (mussel)	*Subninella undulata* (turbo)	*Cellana solida* (limpet)	*Notohaliotus ruber* (abalone)	Other
5-10 cm	40	14	2	1	0
10-15 cm	15	14	16	1	3
15-20 cm	7	9	5	1	4
20-25 cm	4	6	4	0	1
25-30 cm	143	27	6	0	0
30-35 cm	36	11	4	2	0
35-40 cm	49	14	5	4	4
40-45 cm	53	7	2	3-10	2
45-50 cm	37	16	3	2-4	1

Note

Mytilus sp. was estimated on a count of apexes, with the total count divided by two. The *Subninella undulata*count was based on operculums. The *Cellana solida* count was based on the total number of apexes. The count for *Notohaliotis ruber* was the most difficult. Where possible, the count was based on the apex, but in some spits this was obviously inadequate, particularly in spits 40-45 cm and 45-50 cm where the highest concentrations of *Notohaliotis* sp. was found. The figure for these levels must be interpreted with caution and given the status of an educated guess.

THE EFFECT OF A SPRING FIRE ON THE NUMBER OF BIRD SPECIES

Ann V. Ratkowsky

Tolmans Hill, Ridgeway, near Hobart, an area of approximately 200 hectares, is covered by dry sclerophyll forest. On 27 October, 1977, a bushfire burnt through about a quarter of this area, destroying all low vegetation and tree foliage up to about eight metres in height. Five days later, I discovered a section of bushland where a jeep track had acted as a fire break, resulting in a small area of burnt bush on one side of the track, and unscathed bush on the other side. I thought it would be of interest to count the different species of birds on either side of the track to determine whether there was a difference in the number of species, and to observe any changes, with time, as the burnt area regenerated.

During each visit, I walked slowly (c. 2 km/h) along the 350m section of track for ten minutes, recording the number of different species of birds seen or heard in each of the two areas. The count was then repeated in the reverse direction. I continued visiting the area until there was no longer any difference between the two areas in the numbers of bird species noted. A total of 26 visits was made over a period of 13 weeks.

In the first eleven weeks, an average of 2.7 species per counting session was observed in the burnt area. From 20 January, 1978, this number suddenly increased to an average of 7.0, thus equalling the average count in the unburnt area, which remained practically constant at about 7.0 throughout the entire period of observation. During the first week, the Fan-tailed Cuckoo, Black-headed Honeyeater, and Black-faced Cuckoo-shrike were observed in the burnt area (perhaps due to habitat or to fidelity to habitat), but they disappeared subsequently, relinquishing the burnt region to the regular inhabitants, viz. Forest Raven, Yellow-throated Honeyeater, Grey Shrike-thrush, with sporadic appearences of the Spotted Pardalote, Clinking Currawong, Blackbird and Dusky Robin. From 20 January, i.e. after eleven weeks, the following species appeared suddenly in the regenerating burnt area after having been seen only in the unburnt area previously : Black-headed Honeyeater, Brown Thornbill, Blue Wren, and, to a lesser extent, The Dusky Woodswallow, Black-faced Cuckoo-shrike and Striated Pardalote. In addition, the Satin Flycatcher and Flame Robin, neither of which had been seen previouly in either area, simultaneously appeared in both areas. At this time, the regrowth vegetation consisted of substantial new shoot growth at the bases and trunks of the eucalypt trees, accompanied by considerable recovery and regrowth of the other flowering plants.

The following species were the most regular inhabitants of the unburnt area throughout the entire project : Blue Wren, Grey Shrike-thrush, Forest Raven, Yellow-throated Honeyeater, Black-headed Honeyeater, Spotted Pardalote, Black-faced Cuckoo-shrike, Brown Thornbill, Fan-tailed Cuckoo and Golden Bronze-cuckoo.

The following table summarizes the results according to species:

SPECIES	UNBURNT AREA	BURNT AREA
Fan-tailed Cuckoo	Regularly present throughout survey	Present only during first two weeks
Black-headed Honeyeater	"	Present during first two weeks, then absent for nine weeks, then reappeared
Black-faced Cuckoo-shrike	"	"
Brown Thornbill	"	Absent during first eleven weeks
Blue Wren	"	"
Forest Raven	"	Regularly present throughout survey
Yellow-throated Honeyeater	"	"
Grey Shrike-thrush	"	"
Golden Bronze-cuckoo	"	Absent throughout survey
Spotted Pardalote	"	Sporadically present throughout survey
Clinking (Grey) Currawong	Sporadically present throughout survey	"
Blackbird	"	"
Dusky Robin	"	"
Dusky Woodswallow	"	Absent during first eleven weeks
Striated Pardaloted	"	"
Satin Flycatcher	Absent during first eleven weeks	"
Flame Robin	"	"

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BONNET HILL AREA

G. Van Munster

Between Hobart and Kingston is a low range of hills which includes Mt. Nelson, Albion Heights, The Lea and the Bonnet Hill. The following is an account of the main features of the area.

CLIMATE

The climate of the range is maritime temperate with a mild summer and cool to cold winter. The range borders the west side of the Derwent Estuary and is approximately 20km from the open ocean. Mount Wellington (1270m) which is frequently cooled with snow in winter and approximately 8km distance from Bonnet Hill influences the temperature of the westerly winds and also the rainfall. Both the breezes from the ocean and the westerly winds create sudden changes of temperature of up to 10°C The average of winter maximum temperatures is 13°C, and of summer maximum temperatures 20°C. The daily winter temperature extremes can vary from a minimum of 3°C at night to a maximum of 21°C during the daytime while the daily summer temperature extremes can vary from a minimum of 4°C at night to a maximum of 41°C during the daytime.
Cool changes are sometimes sudden, particularly as a result of sea breezes in the summer months.

Frosts occur on approximately 20 days each year but serious damage to the flora has not been observed in this area as a result of frost. Humidity very seldom reaches 17mb and averages about 10mb during the year.

Rainfall averages about 700mm per year. It is fairly evenly distributed throughout the year with peaks in spring and autumn.

Sunshine varies from an average of 8 hours a day in January to an average of 4 hours a day in June.

Winds are predominantly northwesterly for most of the year except during the summer when they are mainly southeasterly sea breezes. The average monthly wind speed ranges from 11km/hour in June to 15km/hour in November.

Snowfall is sporadic on the Bonnet Hill range and melts very quickly in the sunshine.

TERRAIN

This low mountain range varies from sea level to an average height of around 260m but rises to 340m at Mt. Nelson. The western slopes near the Southern Outlet Road are about 40m in height.

Except for Bonnet Hill, 241m, the top of the range is slightly undulating terrain. There is a relative flat plateau called the Albion Heights at 260m. From this plateau the terrain slopes steeply towards Taroona (slopes of up to 16°) and to Proctors Road (slopes of up to 8°). Cut into the steep slopes are many deep gullies which form creeks during the rainy periods.

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GEOLOGY AND SOIL FERTILITY

The main type of rock in this area is *Jurassic dolorite* with fringe areas of *Permian quartz siltstone - mudstone* and *Triassic sandstone* at the foot of the hills near the foreshore.

The surface of the range shows scattered fragmented dolorite rock. Soil developments in general are poor, varying from outcrops of solid bedrock to gullies with 2m or more deep soil. The surface is a sticky black clay when wet, up to 40m thick. Under this mantle of black soil is a yellowish clay. In its dry state the black soil is friable and forms large cracks caused by shrinkage. When the soil becomes wet the cracks close. This swelling and shrinking of soil causes movement with a creeping downward effect on the steep slopes. Where there is sufficient tree and undergrowth cover shrinkage of the soil is minimised and cracking down does not occur.

On pasture land and on bare areas landslides have occurred. These are caused by a combination of steepness of the slope (15° and over) and the saturation of the soils. The cracks absorb large quantities of water during wet period which is then released into the subsoil. The sloping bedrock lacks a sufficiently rough surface texture to hold the saturated soils, and landslides can take place.

The development of residential structures increase the risk of landslides on the steeper slopes. The clearing of natural cover through site excavations could cause adverse effects on the soil stability. The discharge of sewerage and sullage effluent with stormwater, if not carefully regulated, may, when added to the natural soakage, produce minor landslides. Although there is not a great depth of soil on the top of the range, large mature eucalypt trees, up to 45m height, are found in isolated areas. Most of the large eucalypts have been removed since white man's settlement. Frequent burning off of the areas resulted in a more open terrain prone to wind exposure and lack of ground cover, causing rainwater to run off more rapidly. The wind and rainwater run off contribute to the erosion and loss of the fertile ashes following fires.

The dolorite soil in itself is fertile as shown in the following analysis.

Soil analysis of Jurassic Intursive Dolorite Rocks:

Si 02	53.3%	H20 -	- %
A12 03	15.5%	HsO +	0.7%
Fe2 03	0.8%	MnO	0.1%
FeO	8.3%	Ti 02	0.6%
MgO	6.8%	P205	0.1%
Ca O	11.1%	C 02	- %
Na2 O	1.7%	Cr2 03	- %
K2 O	1.0%		
			100 %

The question "Do fires reduce fertility?" is very difficult to answer. Certain elements are lost, but heat, is sufficient, will create minor breakdown of rock particles and, as such, speed up new releases of minerals.

Lack of humus in the upper layer of the soil has cuased most of this area to degenerate into open forest with poorly developed trees and shrubs. The flora is much richer and better developed in the less frequently burned area of the Lea. Through lack of humus the water holding capacity is much less and the flora regenerating after the fires, suffer during the dry summer period.

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Natural erosion and silting have created greater depth of fertile soil in the fullies. With the capacity to hold more moisture, the flora is much denser with trees reaching mature heights.

DRAINAGE

Rainfall occurs fairly evenly through out the year, with peaks in spring and autumn. Most of the total of about 700mm returns quickly through the short creeks to the sea. The fringe of the plateau and the slopes drain rapidly due to their steepness, lack of humus and ground cover.

The plateau with its many small depressions and rocks drains very slowly. During the winter months, puddles of surface water and sogginess of soil are common for weeks on end. The perennial Vincent Rivulet at the western boundary of the range collects most of its water from Mt. Nelson and Albion Heights thus indicating the water holding capacity of these areas.

Due to the heavy plastic black clay, erosion is very limited in this area. Water flows are not strong enough to cause damage to the surface.

VEGETATION

The area consists of dry sclerophyll forest, savanna woodland and grassland. The flora is characteristic of areas with less than 1000mm. Rainfall is dominated by eucalypts. Various aspects of the area and man's interference, influence the number of species recorded. The density of the flora varies mainly due to moisture in the surface soil, bushfires and grazing.

The gullies are richer in species and density due to the cooler and wetter conditions. The upper part of the range with the western and southern slopes are affected by the dry nocturnal westerly winds especially during springtime. Fires on these slopes and on the plateau are much hotter. The long term effect of regular firing is an invasion of grasses, sedges and exotic perennials carried in by wind, birds or other means. The new tender shrub shoots and the native perennials are closely grazed by the animals and this combined with the competition from introduced grasses has led to the gradual eradication of many plants.

Close to the Bonnet Farm most of the Bonnet Hill area has been used for grazing by sheep and cattle since the last century. There are several large paddocks cleared of trees and rocks practically right to the foreshore. On the steep slopes where a tree cover exists, the undercover of grasses and sedges is used for grazing. The introduced shrub *Ulex europaeus* (gorse) with its sharp, thorny foliage could become a dominant plant and increase the fire hazard. It burns fiercely in a fire and afterwards the seeds germinate quickly in the open soil. As this shrub is not grazed by animals or insects it could spread quickly and cover the open woodland (a similar situation exists on Mt. Knocklofty, West Hobart). At present it is becoming established throughout most of the woodland. Common ground cover plants found in areas not burnt since 1967 are: *Epacris impressa, Tetratheca pilosa, Astroloma humifusum, Lomatia tinctoria, Diplarrena morea* and other perennials.

Eucalyptus globulus is usually dominant on the eastern slopes of the range and in the gullies with a few patches of pure stands. The plateau with its poor drainage is dominated by the swamp gum, *Eucalyptus ovata*. *Eucalyptus pulchella* is more common at the better drained areas on the top and evenly distributed on the western slopes of the range. *Eucalyptus viminalis* is less common and is found mainly on the southern and western slopes. There are a few *Eucalyptus obliqua* in the damp gullies in the centre of the range.

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TREES AND SHRUBS OF THE BONNET HILL AREA (survey May 1978)

Acacia dealbata
" *melanoxylon*
" *mearnsii*
" *stricta*
" *verticillata*
Astroloma humifusum
Banksia marginata
Bedfordia salicina
Bursaria spinosa
Cassinia aculeata
Casuarina littoralis
" *stricta*
Clematis aristata
Correa reflexa (in gullies at eastern slope)
Dodonea viscosa
Epacris impressa
Eucalyptus globulus
" *obliqua* (in gullies, near the top)
" *ovata* (wetter areas, near the top)
" *pulchella*
" *viminalis*
Exocarpos cupressiformis
Hebe (Veronica) formosa (lower parts of western slopes)
Leptospermum scoparium
Leucopogon virgatus
Lomatia tinctoria
Pimelea humilis
Plagianthus sidoides (lower eastern slopes)
Pomaderris eliptica (in gullies at eastern slopes)
Pultenaea juniperina
Senecio linearifolius
Tetratheca pilosa
Ulex europaeus (introduced gorse)

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BIRDS OF THE BONNET HILL AREA	Lea Scout Camp		Proctors Rd - Bonnet Hill Area			
	Mch '78	Jul '77	Jun '60	Jun '59	Nov '48	May '48
Vanellus miles Masked Lapwing (Spurwing Plover)	-	-	-	+	-	+
Phaps chalcoptera Common Bronzewing	-	-	+	-	-	-
Calyptorhynchus funereus Yellow-tailed Black-Cockatoo	-	-	-	-	+	-
Platycercus caledonicus Green Rosella	-	-	+	+	-	-
Cuculus pyrrhophanus Fan-tailed Cuckoo	-	-	-	-	+	-
Chrysococcyx basalis Horsefield's Bronze-Cuckoo	-	-	-	-	+	-
Turdus merula Blackbird	-	-	+	+	-	-
Petroica rodinogaster Pink Robin	+	-	-	-	-	-
Petroica phoenicea Flame Robin	-	-	+	-	-	+
Petroica multicolor Scarlet Robin	+	+	-	+	+	+
Melanodryas vittata Dusky Robin	+	+	+	+	-	+
Pachycephala olivacea Olive Whistler	-	-	-	+	-	-
Pachycephala pectoralis Golden Whistler	+	-	+	+	+	+
Colluricincla harmonica Grey Shrike-thrush	+	-	+	-	+	+
Myiagra cyanoleuca Satin Flycatcher	-	-	-	-	+	-
Rhipidura fuliginosa Grey Fantail	-	-	+	+	+	+
Malurus cyaneus Superb Fairy-wren (Blue Wren)	-	+	+	+	+	-
Sericornis frontalis White-browed Scrubwren	-	-	-	+	-	-
Acanthiza pusilla Brown Thornbill	+	-	+	+	-	+
Anthochaera paradoxa Yellow Wattlebird	+	-	+	-	-	-
Lichenstomus flavicollis Yellow-throated Honeyeater	+	+	+	+	+	+
Melithreptus validirostris Strong-billed Honeyeater	+	-	+	+	-	-
Melithreptus affinis Black-headed Honeyeater	+	+	+	-	-	+
Phylidonyris pyrrhoptera Crescent Honeyeater	+	+	-	+	-	+
Phylidonyris novae-hollandiae New Holland Honeyeater	+	+	+	+	+	+
Acanthorhynchus tenuirostris Eastern Spinebill	+	+	+	-	-	+
Pardalotus punctatus Spotted Pardalote	+	-	-	+	+	+
Pardalotus striatus Striated Pardolote	+	-	-	-	-	-
Zosterops lateralis Silvereye	-	-	-	+	+	-
Carduelis carduelis European Goldfinch	-	-	-	-	+	-
Passer domesticus House Sparrow	-	-	+	-	-	-
Emblema bella Beautiful Firetail	+	-	-	-	-	+
Artamus cyanopterus Dusky Woodswallow	+	-	-	-	-	-
Corvus tasmanicus Forest Raven	+	+	-	+	-	-

OBSERVATIONS: March 1978, July 1977 by J.G.K. Harris
June 1959, November 1948, May 1948 by L.E. Wall

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LAND USE

Much of the dry sclerophyl forest was converted into farmland during the first half of the 19th Century. The Bonnet Farmhouse was built in 1832. Before this period the aborigines could have burned the range occasionally. Middens were found near Alum Cliff. Findings in the middens indicated that the aborigines main food supply came from the sea. *

Since European settlement, fires have been lit frequently to provide an open cover of grasses for sheep and cattle. Practically all the land is privately owned except for the summit of Bonnet Hill and some reservoir areas belonging to the Council.

Following the major bushfire of 1967 and subsequent downturn in the profitability of farming, grazing intensity has decreased during the past decade.

To prevent future bushfire disasters, the local Rural Fire Brigade frequently burn the northern and eastern aspects of the range to protect the residential areas of Mt. Nelson and Taroona.

The area has been very little used by the public as most of the land is privately owned. An exception is "The Lea" belonging to the Tasmanian Scout Association, which property is regularly used for camping. The range has however a social relationship with the Channel Highway, which has become a tourist road since the opening of the Southern Expressway in 1969. It is the beautiful scenery of the Derwent Estuary with the Channel Highway twisting through the steep paddocks and bushland that makes the area so valuable. Future residential development would convert this relatively quiet road and surroundings into a common busy housing estate from which the natural flora and fauna would largely disappear.

*The Tasmanian Naturalist No. 53 May 1978: Jim Stockton, Alum Cliffs Test Excavation.

HISTORY

The top of the Bonnet Hill and the Albion Heights have no visible remains of historical sites. It is highly likely that the surveyors used the Bonnet Hill as a landmark in the 19th Century. The range with the steep slopes forced the formation of two roads between Hobart and Kingston. Proctors Road was established in 1935 and the much longer Channel Road in 1940.

'Acton House' an old guard house of classic straight Georgian style was built circa 1826. Its convict build sandstone walls show considerable cracking, probably due to excessive water from the tar sealed Channel Highway causing creeping of the soil on the steep slope.

Close to 'Acton House' is the 'Shot Tower', designed and built by the owner Joseph Muir in the year 1870. The Tower was used for making shot. Many tourists call daily to climb the 60m high tower, and visit the museum in the Tower's outbuilding.

The 'Bonnet Farm' house, of Georgian style on the south eastern slope of the Bonnet Hill, was built in 1832. The two buildings are now used as a private dwelling and have lost most of their outside charm by the white paint over the sandstone. It was from this farm that the Bonnet Hill area was partly cleared and the surrounding land used for grazing.

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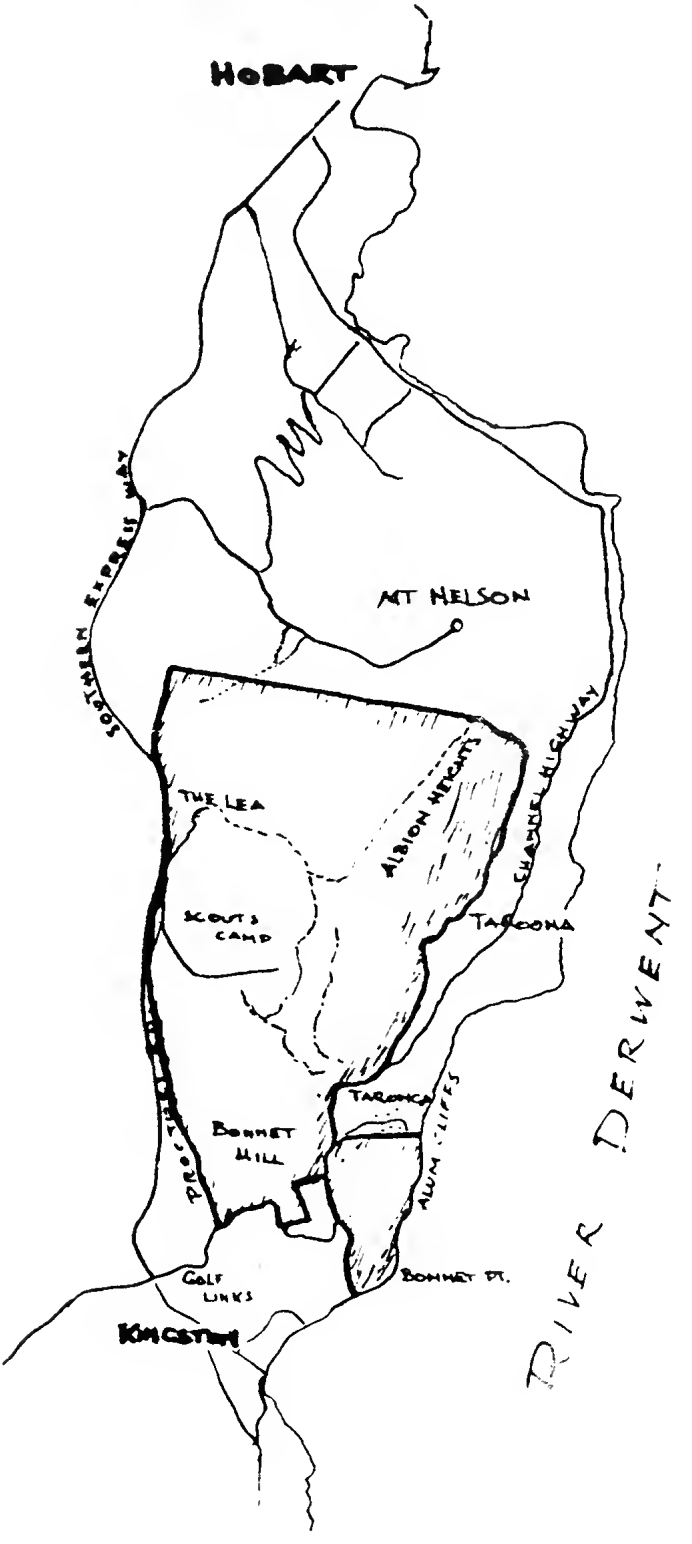
HOBART
SOUTHERN EXPRESS WAY
MT NELSON
THE LEA
ALBION HEIGHTS
CHANNEL HIGHWAY
SCOUTS CAMP
TAROONA
TARONGA
BONNET HILL
ALUM CLIFFS
GOLF LINKS
BONNET PT.
KINGSTON
RIVER DERWENT

TOWARDS A FLORA OF MAATSUYKER IS.

Part 11 Ferns, Clubmosses and Lichens

A.M. Moscal & G.C. Bratt

1. INTRODUCTION:

Part 1 of this article (see the Tasmanian Naturalist, No. 51, November 1977) gave a general description of the Island together with lists and discussion of the vascular plants.

Part II summarises the non-vascular plants of Maatsuyker Island. The ferns and clubmosses are listed in Table 1 and the lichens in Table II.

All of the species of ferns and clubmosses are known from the Tasmanian mainland.

The lichens were collected from the South & Southwestern cliffs, Eastern and Western slopes, North, South and North-South ridges and North point.

Of the lichen species examined in detail, all are known from the Tasmanian mainland. Hence if there is an endemic lichen flora it is restricted to uncollected species or those listed in Table II as incompletely examined.

Of particular note is the absence of *Xanthoria parietina* a very common lichen of the sea coast of Tasmania. It is possible that this is replaced by *Polycauliona cribrosa* a species whose near relatives are common on sub-antarctic Islands.

TABLE I - FERNS AND CLUBMOSSES OF MAATSUYKER ISLAND

Asplenium obtusatum	F	(a)	Most common, from salt spray to peak
Blechnum wattsii	F	(b)	At all elevations
Dicksonia antarctica	F	(h)	In sheltered east facing gullies to 4mm. Around main peak to 1m.
Histiopteris incisa	F	(e)	In seepage areas
Lastreopsis shepherdii	F	(f)	In gullies
Lycopodium varium	C		2 clusters 1km apart on humus rich forest floor
Microsorium diversifolium	F		Throughout shrubbery & forest area
Polystichum proliferum	F	(c)	In gullies and forested areas
Pteridium esculentum	F	(d)	Mainly in abandoned garden plots
Pteris tremula	F	(g)	In moist sheltered places

C = Clubmoss
F = Fern

(a)-(h) = Scale of abundance:
(a) = Abundant;
(h) = Rare.

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TABLE II - LICHENS OF MAATSUYKER ISLAND

LICHEN	LICHEN TYPE (a)	SUBSTRATE (b)	ABUNDANCE (c)
Caloplaca cf. citrina (d)	C	R	2
" murorum	C	R	1
" sp. (e)	C	T	4
Candelariella vitellina	C	T	3
Catillaria rimosa	C	R	2
Cladia retipora	Fr	S	3
Cladina leptoclada	Fr	S	3
Cladonia calycantha	Fr	T	3
" cornutoradiata	Fr	S	2
" scabriuscula	Fr	T,S	2
" subcervicornis	Fr	S	2
Coccocarpia pellita	Fo	R	2
Collema laeve	Fo	T	4
" leucocarpum	Fo	T	4
"Graphids" 3sp. (f)	C	R,T	1?
Hypogymnia billardierii	Fo	T	4
" lugubris	Fo	T	3
Lecanora sp. (e)	C	R	4?
Lecidea dicksonii	C	R	4?
Lecideaceae (g)	C	R,T	2
Lepraria incana	C	R	3
Menegazzia terebrata	Fo	T	4
Ochrolechia pallescens	C	R	2
Parmelia caperata	Fo	R	4?
" perlata	Fo	T	2
" pruinata	Fo	T	3
" reticulata	Fo	S,T	2
" revoluta	Fo	T	4
" subalbicans	Fo	T	2

LEGEND FOR TABLE II

(a) The lichens are classified for convenience into:-
C = crustose - lichen almost inseparable from substrate
Fr= fruticose - lichen with stem or strand structure
Fo= foliose - lichen with leaf like appearance
SFo= sub foliose - lichen with small (3-5mm) leaf like appearance.

(b) Abbreviations used here are:-
R = rock - in all cases quartz schist
S = soil
T = trees or bushes or dead wood

(c) A crude scale of abundance based upon the number of samples

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of each species collected From 1 = abundant to 4 = rare.

(d) Further confirmation required

(e) sp. known from other collections but determination presently uncertain

(f) Probably several species represented. Insufficient informatio presently available for determination.

(g) Determination to family only.

LAND BIRDS AT SEA

Leonard E. Wall

In "Australian Birds" Vol. 12, pps 1-7 is published a summary of two seabird logs for Tasmanian waters, 1948-61. These logs have been kept by Captain R. Ainsworth, at that time a member of Tasmanian Field Naturalists' Club, and L. Amiet. Included in Captain Ainsworth's logs were several references to land birds observed at sea. These however, were not included in the abovementioned summary, but are detailed below for record purposes.

14/8/48. Seven miles inside Port Philip Heads, a Homing Pigeon seen heading north and followed up P.P. Bay, tried to land on ship but couldn't because of gale. Attacked by skuas.

13/9/50. 5pm. and about 70 miles E. of King Is., two Dusky Wood Swallows were observed flying about the vessel. I don't know where they came on board unless it was Banks Strait. The weather was poor visibility being misty, light N.E. wind and slight sea.

15/4/51. 8am. and 35 miles east of Cape Wickham, 1 White-faced Heron flew around the vessel then headed north. Moderate N. wind and sea. Cloudy.

1/4/51. In Bass Strait, 1 Brown Hawk seen sitting on the back stay. Travelling westward. Moderate fresh W. wind and sea. Overcast and showery.

6/11/51. 7.30am. 20 miles S. of Sydney, 1 Kingfisher (not identified) observed perched in the rigging. It stayed with us all morning then disappeared. Moderate N.W. wind and sea with smoke haze, poor visibility.

BOOK REVIEWS - MOLLUSCS

by

Elizabeth Turner, Tasmanian Museum.

It is estimated that more than 127,000 species of molluscs inhabit the world. Thus it would have been no easy task to select the 2,000 or so species which Peter Dance has illustrated in "The Encyclopedia of Shells", ANZ Book Co., Sydney, 1977. This well presented book caters for the beginner in shell study and for the person who has already attained some knowledge in this field. The informative introduction covers classification and the general habits of molluscs, as well as their collection, preparation and storage. Simple diagrams name the different parts of gastropods and bivalves. A world map shows the geographical distributions referred to in the identification key which is provided. The species included are placed in taxonomic order, often with popular names quoted, and most are well known in their respective countries of origin. As amateurs' shell collections usually consist of popular shells, most of them will be found in this book. A comprehensive glossary and an index conclude a reference work which will be very useful for collectors interested in mollusc species throughout the world. Copy supplied by ANZ Book Co. P/L.

"Seashells of the World", ANZ Book Co., Sydney, 1977, by Gert Lindner, is another book which illustrates shells from around the world. However, this one is for the more advanced collector. Basic diagrams of gastropods and bivalves are depicted inside the covers of the book. The introduction to molluscan systematics covers classification, rules of nomenclature, type specimens and synonyms. These topics are usually missing from popular mollusc publications. There follows a section on anatomy, growth, colour, function and geographical distribution. A large chapter deals with the characteristics and morphology of the major molluscan families and subfamilies. The 1,072 species depicted are illustrated in colour and notes about them are explicit. Popular names, if any, are included. The book ends with an informative bibliography. Amateur collectors will find this volume helpful and interesting, while scientific workers will benefit from its emphasis on the correct procedures for the classification of shells. "Seashells of the World" has been translated and edited by Gwynne Vevers, Assistant Director of Science and Curator of the Aquarium, The Zoological Society of London. Copy supplied by ANZ Book Co. P/L.

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THE SHAG BAY ROCKSHELTER, TASMANIA

J. Stockton

This article is based on information from Vanderwal, R.L. (1977) The Shag Bay Rockshelter, Tasmania. The Artefact 2 (4): 161-170

The Shag Bay rockshelter was excavated by Dr. Vanderwal in 1974. The shelter chosen for excavation is 15m above the Derwent River. It is the largest of the shelters in the cliff and has a westerly aspect across the Derwent estuary. The shelter is 12m long and 4m deep. The shell midden is capped by a roof fall up to 1m thick. The occupational deposit consists of 25cm of shell midden with large quantities of shellfish remains in a charcoal and ash matrix.

The most common component of the midden was the mussel Mytilus planulatus with a minimum of 3,850 individuals represented in the deposit excavated. Surprisingly, there were very few occurrences of the large common mud oyster Ostrea angasi. Other species present in small numbers were limpets, Chiazacmea flammea, top shells, Austrocochlea constricta and conniwink, Bembicium auratum.

Two stone artefacts were recovered, one a nosed scraper, the other a flake.

There were no remains of animal bone or scale fish bone.

Carbon samples for C_{14} dating were collected from near the top of the occupation zone and from the base. The samples gave dates of $4,720 \pm 110$ B.P. and $5,300 \pm 120$ B.P. respectively. The spread of only 700 years suggests that the rockshelter was used for only a short period in archeological time.

The evidence of the stratigraphy suggests numerous short term occupations. Vanderwal sees Shag Bay as an extreme example of the east coast pattern of intensive, short term, single resource use with mussels the main attraction to the area.

THE PLANTS AND BIRDS OF THE MT. NELSON-BONNET HILL AREA

Ann V. Ratkowsky

Over the past five years I have included the Mt. Nelson-Bonnet Hill area in my various surveys of the vascular plants and birds of the Mt. Wellington area. The following lists augment the information of G. van Munster in his article "Bonnet Hill Area", Tasmanian Naturalist, No. 54, August 1978, in which he describes this naturally rich and valuable area and presents a case for the conservation of its flora and fauna.

My survey area, which includes a considerable proportion of that surveyed by van Munster, also incorporates the northern and eastern slopes of Mt. Nelson.

PLANTS

MONOCOTYLEDONAE

Gramineae (Poaceae)

Agrostis	avenacea
	aemula
Amphibromus	archeri
Danthonia	purpurascens
	setacea
	caespitosa
	procera
	laevis
	pilosa
Deyeuxia	quadriseta
Dichelachne	sciurea
	crinita
Distichlis	distichophylla
Festuca	asperula
Microlaena	stipoides
Pentapogon	quadrifidus
Poa	australis
Stipa	aphylla
	mollis
	pubinodis
Tetrarrhena	distichophylla
Themeda	australis

Cyperaceae

Carex	breviculmis
	inyx
Gahnia	graminifolia
	grandis
	radula
Lepidosperma	elatius
	filiforme
	laterale
	lineare
Schoenus	apogon
	maschalinus

Scirpus	antarcticus
	fluitans
	hookeranus
	inundatus
	platycarpus

Centrolepidaceae

Centrolepis	aristata

Juncaceae

Juncus	gregiflorus
	holoschoenus
	pallidus
	procerus
	subsecundus
	sarophorus
Luzula spp.	

Liliceae

Anguillaria	dioica
Arthropodium	milleflorum
Astelia	alpina
Bulbine	bulbosa
Dianella	revoluta
	tasmanica
Drymophila	cyanocarpa
Laxmannia	sessiliflora
Lomandra	longifolia

Hypoxidaceae

Hypoxis	hygrometrica

Iridaceae

Diplarrena	moraea

Orchidaceae

Caladenia	carnea
	gracilis
Chiloglottis	gunnii
Diuris	pedunculata
Glossodia	major
Microtus	parviflora
Pterostylis	longifolia
	nana
Thelymitra	grandiflora
	ixioides
	nuda
	pauciflora

DICOTYLEDONAE

Ranunculaceae	
Clematis	aristata
	gentianoides
Ranunculus	lappaceus
Dilleniaceae	
Hibbertia	hirsuta
	striota
Violaceae	
Viola	hederacea
Pittosporaceae	
Bursaria	spinosa
Marianthus	procumbens
Tremandraceae	
Tetratheca	pilosa
Polygalaceae	
Comesperma	volubile
Hypericaceae	
Hypericum	gramineum
Malvaceae	
Asterotrichion	discolor
Linaceae	
Linum	marginale
Geraniaceae	
Geranium	potentilloides
	solanderi
Pelargonium	inodorum
Oxalidaceae	
Oxalis	corniculata
Rutaceae	
Boronia	pilosa
	nana
Eriostemon	verrucosus
Correa	reflexa

Stackhousiaceae	
Stackhousia	monogyna
Rhamnaceae	
Pomaderris	elliptica
Sapindaceae	
Dodonaea	viscosa
Mimosaceae	
Acacia	genistifolia
	verticillata
	riceana
	stricta
	myrtifolia
	melanoxylon
	mearnsii
	dealbata
Papilionaceae (Fabaceae)	
Sphaerolobium	vimineum
Daviesia	latifolia
	ulicina
Pultenea	daphnoides
	stricta
	pedunculata
	juniperina
Bossiaea	prostrata
Hovea	heterophylla
Indigofera	australis
Kennedya	prostrata
Rosaceae	
Acaena	ovina
	anserinifolia
Crassulaceae	
Crassula	helmsii
Droseraceae	
Drosera	auriculata
Haloragaceae	
Haloragis	tetragyna
	teucrioides

Myrtaceae

Leptospermum	scoparium
Callistemon	pallidus
Eucalyptus	ovata
	viminalis
	globulus
	obliqua
	pulchella
	amygdalina

Umbelliferae (Apiaceae)

Daucus	glochidiatus

Rubiaceae

Coprosma	hirtella
	quadrifida
Opercularia	varia
Asperula	scoparia

Compositae (Asteraceae)

Lagenophora	stipitata
	huegelii
Brachycome	decipisns
	scapiformis
Olearia	viscosa
	erubescens
	stellulata
	ramulosa
	ericoides
	floribunda
	glandulosa
Vittadinia	triloba
Gnaphalium	collinum
Leptorhynchos	squamatus
	linearis
Helichrysum	scorpioidss
	dealbatum
	apiculatum
	semipapposum
	purpurascens
	dsndroidsum
	obcordatum
	scutellifolium
Cassinia	aculeata
Craspedia	glauca
Senecio	linearifolius
	minimus
	quadridsntatus
	glomeratus
	hispidulus
Bedfordia	salicina
Microseris	scapigera

Stylidfaceae	
Stylidium	graminifolium
Goodeniaceae	
Goodenia	ovata
	lanata
Campanulaceae	
Wahlenbergia	gymnoclada
	consimilis
Lobeliaceae	
Lobelia	gibbosa
Epacridaceae	
Astroloma	humifusum
Cyathodes	divaricata
Lissanthe	strigosa
Leucopogon	collinus
Acrotriche	serrulata
Epacris	impressa
Oleaceae	
Notelaea	ligustrina
Gentianaceae	
Gentianella	diemensis
Boraginaceae	
Cynoglossum	suaveolens
Convolvulaceae	
Convolvulus	erubescens
Solenaceae	
Solanum	laciniatum
Scrophulariaceae	
Euphrasia	collina
Labiatae (Lamiaceae)	
Prunella	vulgaris

Plantaginaceae

Plantago	varia

Polygonaceae

Rumex	brownii

Lauraceae

Cassytha	pubescens

Proteaceae

Lomatia	tinctoria
Banksia	marginata

Thymelaeaceae

Pimelea	linifolia
	humilis
	nivea

Santalaceae

Leptomeria	drupacea
Exocarpos	cupressiformis
	strictus

Euphorbiaceae

Poranthera	microphylla
Beyeria	viscosa
Phyllanthus	australis

Casuarinaceae

Casuarina	stricta
	littoralis

PTERIDOPHYTA

Dennstaedtiaceae

Pteridium	esculentum

Adiantaceae

Cheilanthes	tenuifolia

BIRDS

Accipiter fasciatus	Brown Goshawk
Falco berigora	Brown Falcon (Brown Hawk)
Falco cenchroides	Australian Kestrel
Coturnix australis	Brown Quail
Rallus pectoralis	Lewin's Rail
Vanellus miles	Masked Lapwing
Phaps chalcoptera	Common Bronzewing
Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo
Lathamus discolor	Swift Parrot
Platycercus caledonicus	Green Rosella
Cuculus pallidus	Pallid Cuckoo
Cuculus pyrrhophanus	Fan-tailed Cuckoo
Chrysococcyx lucidus	Shining Bronze-Cuckoo (Golden Bronze Cuckoo)
Ninox novaeseelandiae	Southern Boobook (Spotted Owl)
Podargus strigoides	Tawny Frogmouth
Hirundapus caudacutus	White-throated Needletail (Spin-tailed Swift)
Dacelo novaeguineae	Laughing Kookaburra
Hirundo neoxena	Welcome Swallow
Cecropis nigricans	Tree Martin
Anthus novaeseelandiae	Richard's Pipit (Australian Pipit)
Coracina novaehollandiae	Black-faced Cuckoo-shrike
Zoothera lauma	White's Thrush (Ground Thrush)
Turdus merula	Blackbird
Petroica rodinogaster	Pink Robin
Petroica phoenicea	Flame Robin
Petroica multicolor	Scarlet Robin
Melanodryas vittata	Dusky Robin
Pachycephala olivacea	Olive Whistler
Pachycephala pectoralis	Golden Whistler
Colluricincla harmonica	Grey Shrike-thrush
Myiagra cyanoleuca	Satin Flycatcher
Rhipidura fuliginosa	Grey Fantail
Cinclosoma punctatum	Spotted Quail-thrush
Malurus cyaneus	Superb Fairy-wren (Superb Blue Wren)
Sericornis frontalis	White-browed Scrubwren (Brown Scrubwren)
Acanthiza pusilla	Brown Thornbill
Acanthiza ewingii	Tasmanian Thornbill
Acanthiza chrysorrhoa	Yellow-rumped Thornbill
Anthochaera paradoxa	Yellow Wattlebird
Anthochaera chrysoptera	Little Wattlebird
Lichenostomus flavicollis	Yellow-throated Honeyeater
Melithreptus validirostris	Strong-billed Honeyeater
Melithreptus affinis	Black-headed Honeyeater
Phylidonyris pyrrhoptera	Crescent Honeyeater
Phylidonyris novaehollandiae	New Holland Honeyeater
Acanthorhynchus tenuirostris	Eastern Spinebill
Pardalotus punctatus	Spotted Pardalote
Pardalotus striatus	Striated Pardalote (Yellow-tipped Pardalotte)

Zosterops lateralis	Silvereye
Carduelis carduelis	European Goldfinch
Carduelis chloris	European Greenfinch
Passer domesticus	House Sparrow
Emblema bella	Beautiful Firetail
Sturnus vulgaris	Common Starling
Artamus cyanoptsrus	Dusky Woodswallow
Cracticus torquatus	Grey Butcherbird
Strepera fuliginosa	Black Currawong (Black Jay)
Strepera versicolor	Grey Currawong (Black Magpie)
Corvus tasmanicus	Forest Raven

INTERMEDIATE EGRETS IN TASMANIA

L.E. Wall

Three species of egrets can now be stated to be regular visitors to Tasmania, generally arriving in April or May and returning to the Mainland in October or November - they are the Great Egret (formerly White or Large Egret), the Little Egret and the Cattle Egret. Occasionally individuals remain throughout the summer but they are not known to breed here. Records of the other two species of egrets - the Intermediate Egret Egretta intermedia (formerly Plumed Egret) and the Eastern Reef Egret (formerly Reef Heron) are rare.

There are only two published records of the Intermediate Egret for the State: these were at Howrah on 7 June 1958 (Emu, 59: 184-188) and at St. Helens on 9th March 1977 ("Birds of Tasmania" by R.H. Green, 1977).

On 6 May 1978 I saw five Intermediate Egrets in company with two White-faced Herons near Pateena bridge in the Longford district; they were pure white birds with yellow bills and very slightly smaller than the herons they were with. I was unable to make more detailed observations but the size and bill colour were carefully noted. The following day I was able to spend a leisurely couple of hours in the district but was then unable to find these birds.

A fortnight later I saw another bird which I believe was of the same species on a farm dam at Margate but in the poor light of very late afternoon I could not be sure. On two later visits I was unable to locate this bird again.

There is an increasing belief that other occurrences of the Intermediate Egret have not been recognized because of confusion with the Great Egret. Plumage in both species is similar but the size differences are marked. If, as is usually the case, a Great Egret is seen with a White-faced Heron nearby for comparison, the larger size of the Great Egret is very noticeable, whilst as noted above the Intermediate Egret is slightly smaller than the heron.

THE EFFECT OF TIME OF DAY ON BIRD ACTIVITY

Ann V. Ratkowsky

There is a generally held belief that, as for example stated in the R.A.O.U. Atlas Newsletter, No. 7, September 1978, P. 1: "Generally, Australian birds are most active in the early morning and late evening. Observations during these periods are likely to be more productive". Having conducted several bird surveys over the past few years (Emu. 77:19-22, 1977; Tas. Nat. 53:11-12, May 1978), I felt that bird activity is fairly uniform throughout the whole of the morning. The opportunity became available for me to systematically investigate bird activity at different times of the day when we recently moved to a house situated on the edge of dry sclerophyll bushland at the foot of Mt. Nelson. The survey was prematurely terminated by an indiscriminately lit bushfire which ravaged the survey area on October 2, 1978. Nevertheless, the results accumulated to that date were statistically significant.

Bird activity was assessed as the number of different species seen or heard in timed counting sessions during the day as follows. I made 10 min. walking counts at 7.15a.m., 11.15a.m., 4.30p.m. and 5 min. sitting counts between 11.30a.m. and 1.30p.m. at 30 min. intervals in an area particularly rich in bird life near our house. Although I would not normally mix walking and sitting counts, the fact that the 11.15a.m. walking counts and the 11.30a.m. sitting counts do not differ significantly enables me to present all the results in a single table:

Time of Day	Mean Number of Species $\pm$S.E.	Number of Counting Sessions
7.15a.m.	$16.1^{a\pm}$ 0.72	9
11.15a.m.	$15.7^{a\pm}$ 0.80	9
11.30a.m.	$14.5^{ab\pm}$ 0.43	6
12 Noon	$13.5^{bd\pm}$ 0.54	10
12.30p.m.	$10.0^{c\pm}$ 1.04	10
1.00p.m.	$8.2^{c\pm}$ 0.77	10
1.30p.m.	$8.2^{c\pm}$ 0.78	8
4.30p.m.	$12.0^{d\pm}$ 0.71	9

Note: Means not followed by the same letter differ significantly ($p < 0.05$)

The above table shows that the species numbers throughout the morning are similar, but they decrease after 11.30a.m. to a minimum between 12.30p.m. and 1.30p.m. At 4.30p.m. the numbers are similar to what they were at 12 Noon. The low counts were not due to the absence of any particular species, except that the Strong-billed Honeyeater was almost totally silent at Mid-day. The Black-headed Honeyeater and Forest Raven were less vocal at Mid-day as was the Grey Shrike-thrush in the late afternoon counts. The constancy of the morning counts is gratifying to me as all my previous bird surveys have been conducted between the hours of 7.15a.m. and 11.30a.m.

Future work could be done to study when, how and to what extent bird activity increases from 1.30p.m. onwards, as after that time I investigated only one afternoon time (4.30p.m.). This would give greater insight into bird activity throughout the entire day.