



# The Tasmanian Naturalist

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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 Tarooa (slopes of up to 16°) and to Proctors Road (slopes of up to 6°). Cut into the steep slopes are many deep gullies which form creeks during the rainy periods.

## GEOLOGY AND SOIL FERTILITY

The main type of rock in this area is *Jurassic dolomite* 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 dolomite 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 dolomite soil in itself is fertile as shown in the following analysis.

## Soil analysis of Jurassic Intursive Dolomite Rocks:

S1 O2	53.3%	H2O -	- %
Al2 O3	15.5%	HsO +	0.7%
Fe2 O3	0.8%	MnO	0.1%
FeO	8.3%	Ti O2	0.6%
MgO	6.8%	P2O5	0.1%
Ca O	11.1%	C O2	- %
Na2 O	1.7%	Cr2 O3	- %
K2 O	1.0%		

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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 caused 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.

Natural erosion and silting have created greater depth of fertile soil in the gullies. With the capacity to hold more moisture, the flora is much denser with trees reaching mature heights.

#### DRAINAGE

Rainfall occurs fairly evenly throughout 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: *Eparis impressa*, *Tetratheca pilosa*, *Astroloma humifusum*, *Lomatia tinctoria*, *Diplarrhena 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.

TREES AND SHRUBS OF THE BONNET HILL AREA (survey May 1978)

- Acacia dealbata*  
 " *melanoxyloides*  
 " *marisii*  
 " *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*  
*Epaoris impressa*  
*Eucalyptus globulus*  
 " *obliqua* (in gullies, near the top)  
 " *ovata* (wetter areas, near the top)  
 " *pulchella*  
 " *viminalis*  
*Ezocarpos cupressiformis*  
*Hebe (Veronica) formosa* (lower parts of western slopes)  
*Leptospermum scoparium*  
*Leucopogon virgatus*  
*Lomatia tinctoria*  
*Pimelea humilis*  
*Plagianthus sidaoides* (lower eastern slopes)  
*Pomaderris eliptica* (in gullies at eastern slopes)  
*Pultenaea juniperina*  
*Senecio linearifolius*  
*Tetratheca pilosa*  
*Ulex europaeus* (introduced gorse)

	Lea Scout Camp		Proctors Rd - Bonnet Hill Area			
	'78	'77	'60	'59	'48	'48
	Mar	Jul	Jun	Jun	Nov	May
<u>BIRDS OF THE BONNET HILL AREA</u>						
<i>Vanellus miles</i> Masked Lapwing (Spurwing Plover)	-	-	-	+	-	+
<i>Phaps chalcoptera</i> Common Bronzewing	-	-	+	-	-	-
<i>Calyptorhynchus funereus</i> Yellow-tailed Black-Cockatoo	-	-	-	-	+	-
<i>Platycercus caledonicus</i> Green Rosella	-	-	+	+	-	-
<i>Cuculus pyrrhophanus</i> Fan-tailed Cuckoo	-	-	-	-	+	-
<i>Chrysococcyx basalis</i> Horsefield's Bronze-Cuckoo	-	-	-	-	+	-
<i>Turdus merula</i> Blackbird	-	-	+	+	-	-
<i>Petroica rodinogaster</i> Pink Robin	+	-	-	-	-	-
<i>Petroica phoenicea</i> Flame Robin	-	-	+	-	-	+
<i>Petroica multicolor</i> Scarlet Robin	+	+	-	-	+	+
<i>Melanodryas vittata</i> Dusky Robin	+	+	+	+	-	+
<i>Pachycephala olivacea</i> Olive Whistler	-	-	-	+	-	-
<i>Pachycephala pectoralis</i> Golden Whistler	+	-	+	+	+	+
<i>Colluricincla harmonica</i> Grey Shrike-thrush	+	-	+	-	+	+
<i>Myiagra cyanoleuca</i> Satin Flycatcher	-	-	-	-	+	-
<i>Rhipidura fuliginosa</i> Grey Fantail	-	-	+	+	+	+
<i>Malurus cyaneus</i> Superb Fairy-wren (Blue Wren)	-	+	+	+	+	-
<i>Sericornis frontalis</i> White-browed Scrubwren	-	-	-	+	-	-
<i>Acanthiza pusilla</i> Brown Thornbill	+	-	+	+	-	+
<i>Anthochaera paradoxa</i> Yellow Wattlebird	+	-	+	-	-	-
<i>Lichenstomus flavicollis</i> Yellow-throated Honeyeater	+	+	+	+	+	+
<i>Melithreptus validirostris</i> Strong-billed Honeyeater	+	-	+	+	-	-
<i>Melithreptus affinis</i> Black-headed Honeyeater	+	+	+	-	-	+
<i>Phylidonyris pyrrhoptera</i> Crescent Honeyeater	+	+	-	+	-	+
<i>Phylidonyris novae-hollandiae</i> New Holland Honeyeater	+	+	+	+	+	+
<i>Acanthorhynchus tenuirostris</i> Eastern Spinebill	+	+	+	-	-	+
<i>Pardalotus punctatus</i> Spotted Pardalote	+	-	-	+	+	+
<i>Pardalotus striatus</i> Striated Pardalote	+	-	-	-	-	-
<i>Zosterops lateralis</i> Silvereye	-	-	-	+	+	-
<i>Carduelis carduelis</i> European Goldfinch	-	-	-	-	+	-
<i>Passer domesticus</i> House Sparrow	-	-	+	-	-	-
<i>Emblema bella</i> Beautiful Firetail	+	-	-	-	-	+
<i>Artamus cyanopterus</i> Dusky Woodswallow	+	-	-	-	-	-
<i>Corvus tasmanicus</i> Forest Raven	+	+	-	+	-	-

OBSERVATIONS: March 1978, July 1977 by J.G.K. Harris  
 June 1959, November 1948, May 1948 by L.E. Wall

## LAND USE

Much of the dry sclerophyll 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 Tarooana.

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.

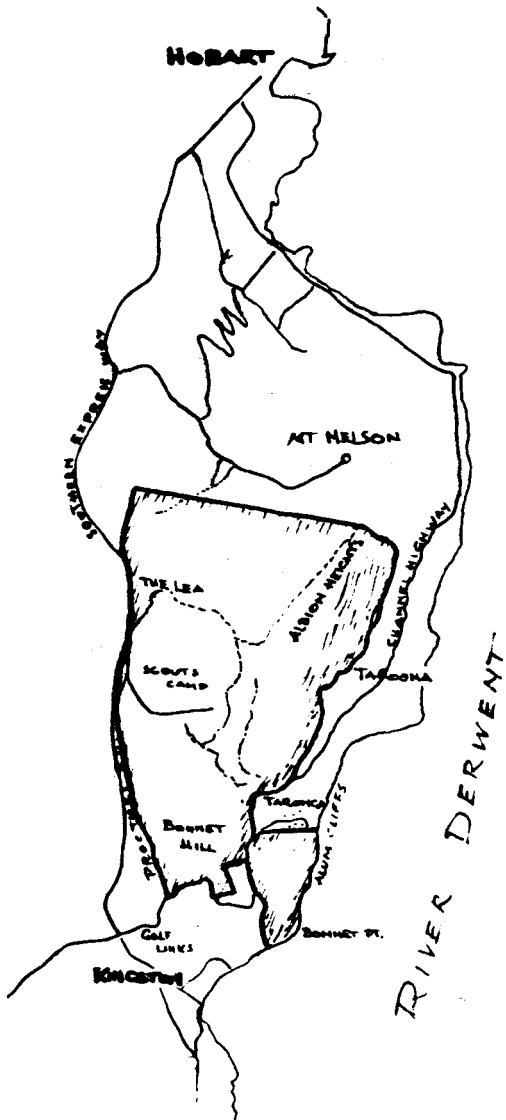
## HISTORY

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.



TOWARDS A FLORA OF MAATSUYKER IS.Part 11 Ferns, Clubmosses and Lichens

A.M. Moscal &amp; 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 CLUBMOSES OF MAATSUYKER ISLAND

<i>Asplenium obtusatum</i>	F	(a)	Most common, from salt spray to peak
<i>Blechnum watsii</i>	F	(b)	At all elevations
<i>Dicksonia antarctica</i>	F	(h)	In sheltered east facing gullies to 4m. Around main peak to 1m.
<i>Histiopteris incisa</i>	F	(e)	In seepage areas
<i>Lastreopsis shepherdii</i>	F	(f)	In gullies
<i>Lycopodium varium</i>	C		2 clusters 1km apart on humus rich forest floor
<i>Microsorium diversifolium</i>	F		Throughout shrubbery & forest area
<i>Polystichum proliferum</i>	F	(c)	In gullies and forested areas
<i>Pteridium esculentum</i>	F	(d)	Mainly in abandoned garden plots
<i>Pteris tremula</i>	F	(g)	In moist sheltered places

C = Clubmoss  
F = Fern

(a)-(h) = Scale of abundance:  
(a) = Abundant;  
(h) = Rare.



TABLE II - LICHENS OF MAATSUYKER ISLAND

<u>LICHEN</u>	<u>LICHEN TYPE</u>	<u>SUBSTRATE</u>	<u>ABUNDANCE</u>
	(a)	(b)	(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

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 information 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.
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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 Gayne Vevers, Assistant Director of Science and Curator of the Aquarium, The Zoological Society of London. Copy supplied by ANZ Book Co. P/L.