



The Tasmanian Naturalist

No. 28

February, 1972

Registered at the G. P. O. Hobart, Tasmania, for transmission by post as a periodica

Supplement to the Bulletin of Tasmanian Field Naturalists' Club
Editor : D. G. Thomas Annual Subscription \$1.00

NOTES ON TASMANIAN FRESHWATER MUSSELS

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THERE are two species of freshwater mussels in Tasmania. They are found only in rivers of the Tamar system in northern Tasmania. Moreover they are apparently confined to the South Esk and its tributaries — although a recent report indicates that mussels may be present in the North Esk. It would be very desirable if this distribution could be determined by naturalists beyond doubt and the author would be pleased to hear of information which may solve this problem. One of the species also occurs in Victoria.

Iredale and Whitley (1938) studied the fluvi-faunula of Australia establishing existing relationships. On the basis of the distribution of the mussels, other mollusca and fish, they named the Tobinian Fluvi-faunula in southern Tasmania, and the Lessonian Fluvi-faunula in northern Tasmania and Victoria. The essential difference as defined depends on the presence of Hyridella in the north and Legrandia in the mountain lakes.

RECENT TASMANIAN SPECIES

Velesunio moretonicus (Reeve) 1864

This species has been known by several different names. The present name was established by Hiscock (1960) upon the discovery of the type in the British Museum. In the revised edition of W. L. May's *Illustrated Index of Tasmanian Shells* the name Velesunio legrandi (Petterd) is used. (Plate 9, fig. 11).
Distribution : The South Esk River and tributaries.

Hyridella narracanensis (Cotton & Gabriel) 1932.

This species is correctly named in the *Illustrated Index* (Plate 9, fig. 12).
Distribution : The South Esk River and tributaries.
Coastal streams of Victoria east from the Yarra River.

The Species Compared

There are very distinct differences between the two species. V. moretonicus is a much longer, broader shell when adult than is the H. narracanensis. The former is typically very broad from the dorsal margin posterior to the beaks, to the anterior margin. The latter species typically has a tapered (acuminate) posterior margin. The essential shell features of the two species are tabled below.

TABLE 1

V. moretonicus (Reeve)	H. narracanensis (Cotton & Gabriel)
Length (max.) : 105 m. m.	60 m. m.
Height (max.) : 65 m. m.	35 m. m.
Shape : Slightly swollen, not globose	Relatively swollen.
Outline : Ovoid	Amygdaloid.
Texture : Heavy and thick	Thickened, not heavy
Margins :	
Anterior : Rounded	Slightly truncate, rounded.
Posterior : Rounded	Produced, acuminate.
Posterior dorsal : Elevated	Slightly elevated.
Ventral : Straight	Rarely straight, convex.
Posterior ridge : Prominent	Very prominent.
Periostracum : Usually dark	Olive to deep purple brown.
Sculpture : Strong growth lines.	Fine growth lines, prominent rest marks.
Nacre : Purplish white, coppery blotches	Blue, slightly irridiscent, coppery purple under beaks.
Beaks : Swollen, not sculptured.	Slightly swollen, sculptured strong v-shaped ridges.
Subfamily : Velesunioninae	Hyridellinae.

FOSSIL TASMANIAN SPECIES

THE following two species have been placed in the subfamily Velesunionae by McMichael (1957), whose work should be consulted for details.

Prohyria johnstoni (Etheridge Jr.) 1881

Type locality Tamar River between Whirlpool Reach and George Town, Tasmania.
Also at Legana.

Etheridge's description is reprinted by McMichael. (1. c.). He suggests that as the posterior end of the shells become acuminate, a muddy environment is indicated. The geological age quoted is Oligocene, but more recent work indicates Eocene.

These early Tertiary beds were considered to be lacustrine. They may be of alluvial fan origin having been built up by streams flowing down the fault scarp into the Tamar trough. This has been a drainage system of considerable importance since the Early Tertiary. It is perhaps not surprising to find the Recent species Velesunio moretonicus in the Tamar system. By the West Tamar River, McMichael means the western shore of the Tamar River.

Alathyria tamarensis (Etheridge Jr.)

This species, of which the description is quoted by McMichael (l. c.), has the same locality and age as the Prohyria johnstoni. Although of the same Subfamily, the genus, Alathyria, now occurs in tropical areas of mainland Australia reaching as far south as the Murray River system. The suggestion by McMichael that it became extinct in Tasmania with the cooling climate since the early Tertiary appears very reasonable.

Distribution of Tasmanian Mussels.

Of the two subfamilies represented in Tasmania, the Velesunionae has the widest distribution throughout Australia. It is represented by a distinct species, V. moretonicus which is not found elsewhere. This species is close to but consistently distinct from Velesunio ambiguous (Philippi), which has a very wide distribution in eastern Australia. On the other hand the Hyridellinae are represented by H. narracanensis, a species which is well represented in the rivers of eastern Victoria including the Yarra. A close check of the distribution of the two species within Tasmania suggests that they are confined to the Tamar system, but there is no apparent record of their presence in the North Esk River. All records examined refer only to the South Esk River or its tributaries. Such a restricted distribution is at least curious, particularly when the possibility that the New Zealand Fauna may have come from Australia is considered (McMichael, 1958). It is not at present possible to offer an explanation, but a close study of all factors involved will be needed.

Much study has been undertaken on the question of land bridge connections between Victoria and Tasmania across Bass Strait. In one such study Dannevig (1915) envisaged a Tamar Major River which received as tributaries the rivers of Tasmania and Victoria which flow into Bass Strait. This idea, which without doubt has some merit, would appear to assist in explaining relations between Victorian and Tasmanian mussels. There are none the less a number of rivers in northern Tasmania which would appear probable tributaries of such a system, but which do not include mussels in their fauna. One possible explanation is that the South Esk system is the only one in Tasmania providing a suitable environment. It has been normal in the past to describe the distribution as "found only in rivers flowing into Bass Strait". This is however very misleading as the South Esk flows into the Tamar River far inland from Bass Strait. The Tamar River is itself a tidal estuary with a very different fauna. The extent to which this has been true during the Pleistocene may well have to be considered in understanding faunal distribution problems.

Habitat

On the surface there appears no reason why mussels should not survive in any Tasmanian river. In discussing the ecology of Australian molluscs Iredale and McMichael (1959) remark that freshwater molluscs include a range from species able to withstand any degree of dessication to those not so able. Only a few Tasmanian streams would provide conditions involving any degree of dessication. Preliminary investigations suggest that pH of the water may be a factor to be considered as an animal immersed in water of pH 8 showed no sign of life for about one month. Placed in water of pH 7.3 it resumed normal activity.

An experiment is being conducted with the co-operation of Mr. R. Hume of Launceston. Specimens of both species are being kept under observation in an aquarium. Observations seem to indicate a rhythm in keeping with the findings of Hiscock (1950) who found an association between diurnal light rhythm and diurnal feeding rhythm in his studies of shell movements. His observations were carried out in the temperature range 17-27°C., but he found no relation to temperature. Mr. Hume has recorded a range from 13-21°C. in his aquarium. The highest river temperature I have recorded to January 1971 was 24°C.

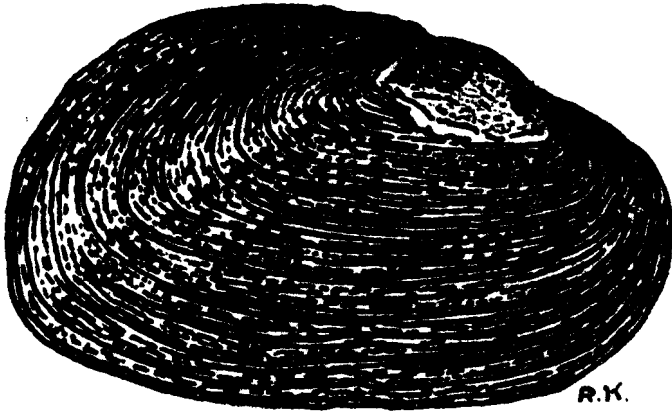
We have observed that, when feeding, the mussels hold an erect position balanced with one end immersed in the sand of the bottom. When moving, the shell changed to an oblique position as the foot was protruded. Movement was not frequent but there were short periods of activity and long periods when the only shell movement was the diurnal rhythm referred to.

Animals have been taken alive in a variety of situations. They occur between stones almost fully immersed in mud in the Cataract Gorge, Launceston. They occur in much firmer material amongst freshwater vegetation in the Lake River, and attached to a stone in fast moving shallow water of the Macquarie River. They have been taken both in main streams and minor tributaries of the system. Little of the early work done appears to have been preserved and a full investigation remains to be done in the future. Mr. Tim Hume's continued interest is therefore of very real value in the study of these animals.

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DORSAL MARGIN



R.K.

VENTRAL MARGIN

VELESUNIO MORETONICUS (REEVE)

ANTERIOR



POSTERIOR

HYRIDELLA NARRACANESIS (COTTON & GABRIEL).

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BIRD MORTALITY ON KING ISLAND 1970

M. T. Templeton

THE Tasmanian Naturalist, No. 21, May 1970 gives the bird mortality on 7 Km of beaches on the West Coast of King Island in the winter of 1969. During the winter of 1970 similar patrols were carried out on the same 7 Km of coastline and specimens were forwarded to Mr. R.H. Green, Queen Victoria Museum, Launceston, for identification and preservation. Several birds brought to me from other parts of the Island are also included.

One of particular interest was an unusually coloured Muttonbird Puffinus tenuirostris, found on the Grassy Golf Course. It was grey with a heavy mottling of white, which gave it the appearance of a Cape Petrel Daption capense.

This years birds carried very little of the oily substance found on birds in the 1969 wreck and only 34 specimens of 11 species, two new to the Island, were found dead; whereas the previous year 68 specimens of 18 species were collected. This excludes Short-tailed Shearwater and Little Penguin Eudyptula minor of which the Little Penguin was quite common in 1969 with very few dead in 1970.

One banded Little Penguin was recovered, details of which are as follows. "Banded as a nestling at Summerland Penguin Reserve, Phillip Island, Victoria. (Lat. 38° 31'S. Long. 145° 08'E) on 20 December 1969 by P. Reilly, Hampton, Victoria; found dead on the beach at the estuary of Porky Creek, King Island, Tasmania (Lat. 39° 52'S, Long. 143° 51'E) 120 miles S-W on 27 July 1970. Elapsed time 7 months."

The eleven species and dates of collection of specimens are :-

Eudyptes chrysocome - Rockhopper Penguin. A fresh specimen on Porky Beach on 12 July, and a dessicated specimen found 200 m south of the point at which the first was collected on 4 August.

Procellaria cinerea - Grey Petrel. One specimen at Porky Beach 12 July (Possibly the first collected specimen from Tasmanian beaches)

Pterodroma lessonii - Whiteheaded Petrel. One specimen at Porky Beach 12 July and one dessicated specimen in long grass above the beach on 22 November.

Daption capense - Cape Petrel. One fresh specimen at Porky Beach on 11 August and wings of one on 30 September.

Halobaena caerulea - Blue Petrel. One dessicated specimen collected by J. Hatten at Admiralty Bay, south of Currie on 11 July, one at Porky Beach on 4 August and a dessicated specimen on 9 September.

Pachyptila salvini - Medium-billed Prion. Two specimens from Porky Beach 5 July, one dessicated specimen collected by J. Hatten at Badger Box, south of Currie 13 July, four at Porky Beach 22 July, one collected 2 km inland from City of Melbourne Bay on the eastern coast on 25 July, one dessicated specimen from Porky Beach 22 November.

Pachyptila turtur - Fairy Prion. One dessicated specimen Porky Beach 28 April, two Porky Beach 4 August and one dessicated specimen on 29 August and one on 1 November.

Pachyptila desolata - Dove Prion. One specimen Porky Beach and another at estuary of Porky Creek on 5 July, one collected by J. Hatten at Admiralty Bay on 11 July, one at Porky Beach 4 August and one at Half Moon Bay on 27 July.

Pachyptila belcheri - Thin-billed Prion. One specimen at Porky Beach 5 July two on 22 July and one on 29 August.

Diomedea chlororhyncha - Yellow-nosed Albatross. One dessicated specimen at Half Moon Bay on 10 October.

Diomedea chrysostoma - Grey-headed Albatross. One dessicated specimen at Porky Beach on 12 July.

Tasmanembryon tasmanicus

Alan J. Dartnall

THE Bothriembryons are a group of snails which are found only in Australia. The stronghold of this group is south-western Australia where many species are known though the relationships within the group remain to be worked out. Three species are known from South Australia and one from Central Australia. One species, Tasmanembryon tasmanicus, is known from Tasmania where it is very common in some places. The shell is about one inch in length and is off-white in colour with longitudinal brown stripes. It is illustrated in Australian Shells by Joyce Allan, 1959, p. 377, fig. 89, 2a and An Illustrated Index of Tasmanian Shells by W. L. May, revised J. Hope Macpherson, 1958, Pl. 42, fig. 7.

Most accounts suggest that T. tasmanicus is known only from the East Coast of Tasmania near the sea on trees and rocks. However, Legrand in his Collections for a Monograph of Tasmanian Land Shells (1871) suggests that the species has a wider distribution, thus:

"Swansea, Port Davey. - Gould. Bay of Fires, Prosser's Bay, on Boobyallas and Wattles. - W. L. Macquarie Harbour. - Milligan. - Lloyd. Port Arthur. - Hurst. South Bruni on a rock. - Rev. H. D. Atkinson. Island near Port Davey. - Doherty".

We do not know whether Legrand actually sighted specimens from the West Coast of Tasmania but it would be of great interest to know whether his informants were correct. If members of the Field Naturalists spot this snail during the coming summer specimens will be received gratefully at the Tasmanian Museum.

BOOK REVIEWS

The Handbook of Australian Sea-birds, by D.L. Serventy, Vincent Serventy and John Warham, 1971. Published by A.H. & A.W. Reed. Price \$8.95.

Until recently the only book readily available to ornithologists has been Alexander's "Birds of the Ocean", a very useful reference but it is worldwide in its coverage and does not give much detail as it is a pocket-book only. Recently Part I of "A Field Guide to Australian Birds" covered this field in more detail, but the book now under review provides all available information and will be the standard of reference for many years.

The opening chapters outline the natural regions in the oceans round Australia, the ocean currents and the productivity of these waters, and the recent geological history which has had a direct effect on the region's birds. Then follow an outline of the Sea-bird fauna, its migrations, some of the most interesting aspects of the biology of some species, brief notes on past and current research and a summary of conservation problems. All these aspects are dealt with in a lucid and very readable form.

The main part of the book deals in depth with each species recorded in the Australian region in each of the Orders of Penguins, Albatrosses and Petrels, Pelicans Gannets and Cormorants, and Skuas Gulls and Terns. The following sub-headings are used :- (a) Field characteristics and General Habits, (b) Measurements, (c) Status of the species in the Australian region, (d) Breeding, including season, nest, eggs, incubation, nestling and breeding distribution and (e) Food. The authors have listed all known breeding stations in Australia, and this shows the extent of their investigations.

Added to all this the book is amply illustrated with photographs (in full colour and in black-and-white), line drawings and keys to identification. In both copies I have seen the four pages of coloured plates, although numbered to indicate that they belong to the back of the book have been bound into the middle, between pages Nos. 118 and 119.

It is to be hoped that this book will be the pattern for publications dealing with other Orders of birds.

L. E. W.

(The review copy of this book has been placed in the library of the Bird Observers Association of Tasmania - Editor).

A Pocketful of Nature, by Peregrine (Michael Sharland), 1971
Published by The Mercury, Hobart.

Peregrine recently completed 50 years not out in providing the weekly 'Nature Notes' to The Mercury newspaper. The publishers are to be congratulated in marking this wonderful record by producing this delightful selection of the author's articles and photographs. Indeed, it is a fitting tribute to a man who has done so much to awaken the consciousness of the general public to the beauties of the Tasmanian bush and its denizens.

D. G. T.