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HISTORY IN A TASMANIAN CHITON

M.K. Macphail & W. Zeidler,
South Australian Museum,
North Terrace, ADELAIDE,
South Australia 5000.

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 *Ischnochiton 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 Nicco 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

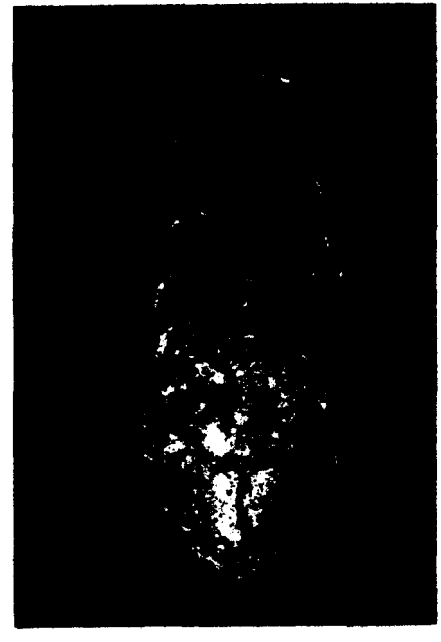

PLATE 2

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 ½" 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 ± 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	"	"