POIRIERA

Auckland Museum
Conchology Section

Vol. 1

CONCHOLOGY SECTION AUCKLAND INSTITUTE AND MUSEUM.

INTRODUCING ___

The Newsletter " POIRIERIA", which from now on will appear at 3 monthly intervals, enlarged and of a new size.

It will contain articles on collecting experiences of members, an illustrated paper dealing with some genus, and regular features, such as new publications, conchological terms, new records etc.

Yours monthly notice will now contain only what might be termed business matters, i.e. Notice of meetings, Field days, Tides etc.

The Committee would be happy to have any suggestions as to how the publication could be improved.

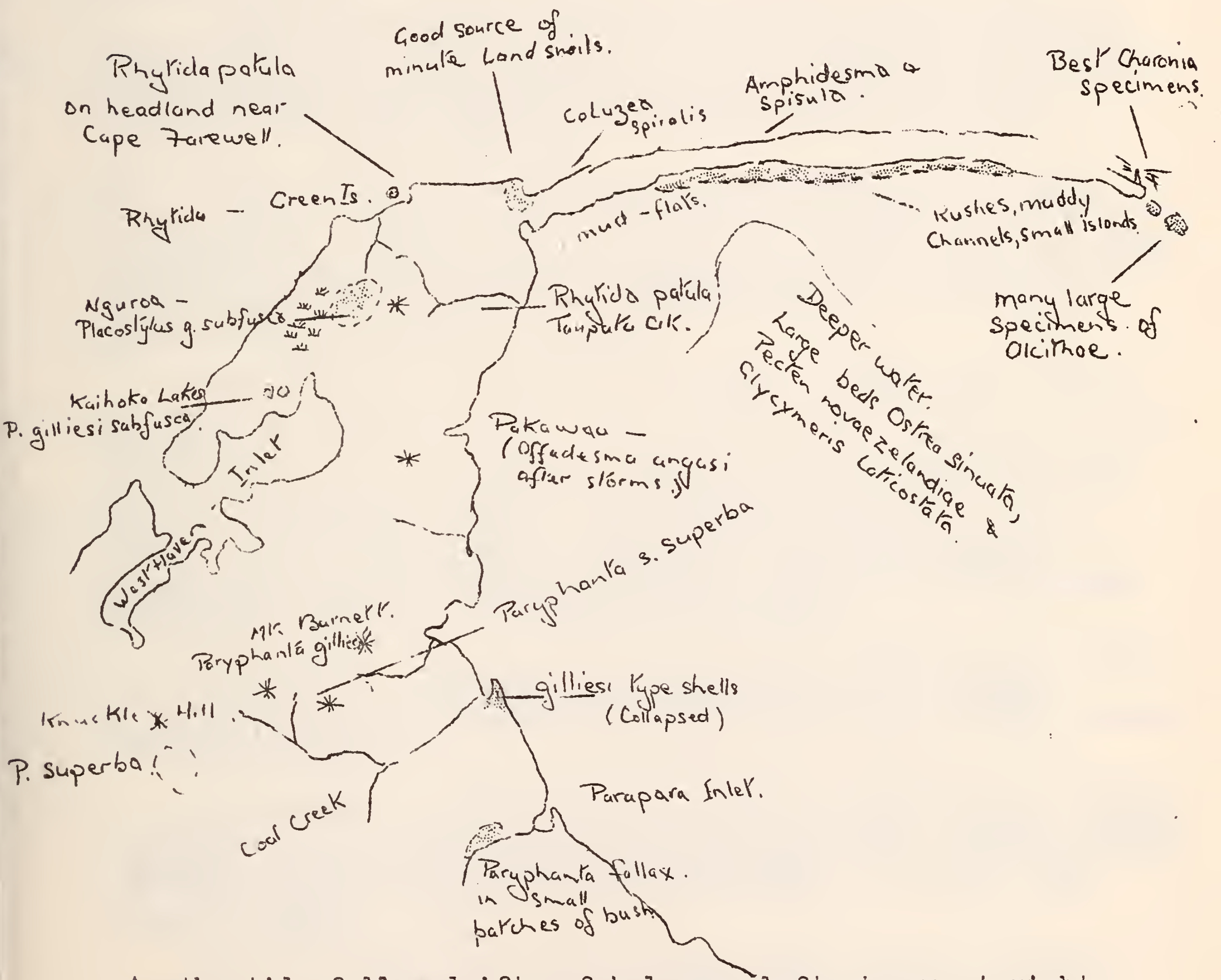
September 1962.

EDITOR.

Farewell Spit as a Source of Conchological Material.

F.Climo.

Although through the years I have found the Spit a valuable source of material, most of my excursions have proved unfruitful. The difficulty appears to be in striking the right weather conditions. Gales from the West and North bring the shells ashore but unless they are accompanied by rain, any material is quickly covered by wind blown sand. To be on the spot during a storm is best for collecting here.



As the tide falls, drifts of kelp are left strewn at right angles to the high water mark. They are the best sources of lightweight shells and minute material.

During the last two years I have collected from kelp drifts :-

Cantharidus purpuratus, Baryspira depressa, B. australis. Janthina violacea, Alcithoe fusus, Xenophalium pyrum, Maurea cunninghami, Poirieria zelandica, Tanea zelandica, Dosinia anus, several species of Neoguraleus and Epitonium and hundreds of minute specimens of Chlamys zelandiae ($\frac{1}{8}$ inch)

The larger shells seem to drift with the continuous current to the end of the Spit where they collect on low shell banks, which are the nesting grounds of several sea-birds. These shell banks, not more than two feet above high water level have yielded to me :- Penion mandarina. P.ormesi, and scores of large volutes (A. arabica and A. swainsoni) , and several beautiful specimens of Charonia. [illegible] a Cabestana spengleri turns up.

Among these larger shells, it is hard to find specimens which still have their colour, but some although bleached have been polished to a high gloss by the sand. My most valuable find from the ocean side of the Spit, has been a perfect specimen of Coluzea spiralis.

Most of the Golden Bay side of the Spit, has no beach. Rushes, mud, rotting drift-wood and low intertidal sandy islands (covered in a sparse growth of Marram) encroach in an irregular line onto acres of mudflats. The only shells I have collected from here is Ophicardelus costellaris which is very common under driftwood among the rushes.

Fossil Point, a reef jutting about 75 yards into the sea at the base of the Spit on the Ocean side, is the best source of material in the vicinity. The current rolls the shells along from farther north westwards, and they collect in a backwash behind this reef. Most are crab-inhabited and the most common are :- Austrofusus glans. and Axymene turbator, I have also collected, Buccinulum vittatum, B. pallidum, Mayena australasia, B. striatum, Aoteadrillia wanganuiensis chordata, Zeatrophon [illegible], and Argobuccinum tumidum.

All shells mentioned so far have been wash-ups, but there are large beds of Amphidesma subtriangulatum and Spisula aequilateralis, which can be reached at low tide in calm weather, on the ocean side.

At low tide on the Golden Bay side are large beds of Chione stutchburyi, and less common Amphidesma australe, Bassina yatei, Myadora striata and Notocorbula zelandica. Below low water can be found Tawera spissa, and in shallow water, now and again Ostrea sinuata.

The following is a list of shells that can be collected alive at Fossil Point :- Patelloida corticata corallina, Risellopsis varia, Radiacmea inconspicua, Notirus reflexus, Hiatella australis, Maurea punctulata, Buccinulum littorinoides, Benhamina obliquata, Paratrophon patens, Lepsia haustrum, Lepsiella scobina albomarginata, Protothaca crassicosta, Modiolus neozelanicus and Lasaea hinemoa among them, Aulacomya maoriana, Mytilus planulatus, M. canaliculus, Neothais scalaris, Cantharidella tesselata and several of the more common "Top-shells" !

--oOo--

Mr. L. Price, Kaitaia reports a New Record :-
" About a month ago, I made another interesting find in the Cape Karikari area. One Sunday I was looking over the Cellana ornata on the way back from fishing, and came upon a solitary specimen of none other than Cellana denticulata which was on top of a mighty big flat boulder at high tide mark, eastern side of the Peninsula about a mile south of the Cape. It is a typical C. denticulata, 42 m.m. in length - a new record no doubt ?"

(A most interesting record for this shell which is more at home in the Cook Strait area. We would very much like to hear from members who have any other records of this shell from Northern localities. Incidentally I have seen numerous sub-recent specimens in the dunes at Cape Maria Van Diemen.

It does exist fairly commonly at East Cape.

Editor).

Eunaticina cincta (Hutton)

We have heard that Mrs. I. Worthy, recently collected from Marsden Point, Whangarei, a nice recent example of this shell, which had previously been on the Doubtful list.

Dr. Powell in the Mus.Rec. writes of the original example -- " -- a stained and rather old shell of large size (20 m.m. X 17 m.m.) picked up in beach drift at Paihia, Bay of Islands by Mr. L.W.Delph. The species is otherwise known only from Landguard Bluff and Te Piki, uppermost Castlecliffian (Pliocene) N.Z. The Paihia specimen may have come from the same raised beach drift. The rusty brown staining of the specimen certainly suggests that source ."

--oOo--

" WEST COAST HOLIDAY."

It was 5th January, 1962, and as usual a young gale was blowing in Cook Strait, but aboard the "Rangitira", Norman Gardner and son Bernhard and myself were happy to be heading for Picton, with the prospect of a fortnight's collecting in the Westport-Karamea area. On arrival we dashed off to town for a meal, and upon returning we were pleased to see our van waiting on the wharf. As darkness was imminent we pulled into an old camp site a few miles along the Blenheim highway, but during the night the weather turned rather nasty, so by daylight we were rather glad to hasten on our way, heading up the broad Wairau Valley.

Spinning merrily along for some time, we ere suddenly confronted with a long uphill stretch of newly constructed road containing two other cars bogged down, partway-up. We pulled up for a review of the situation. However after helping the lower car back to firm ground, a tractor put in an appearance and we were soon towed to the top -- from then on it was all plain sailing.

Not far over the Saddle near Tophouse, we called in to view beautiful Lake Rotoiti, where we plunged in amongst the numerous tr out fishermen to search for some freshwater mussels. Collecting proved to be difficult, the bottom being boulder strewn with little mud, and only a few dead shells were seen. We soon continued on to Murchison, where we made enquiries after Brian Bird, but were told that he is now located in Motueka.

Luckily by now the sun was shing hot and strong, so well into the Buller Gorge we spread out our damp gamping gear to dry, while lunch was on. Late afternoon found us on the West Coast near Granity, and as the tide appeared to be low, we stopped at Nikau Point another mile north, for a quick look. The situation here is sandy with masses of smooth granite boulders, and specimens of the following were found :-

Cellana radians	abundant
" " perana	" small
" ornata	small
Notoacmea parviconoidea	abundant, large
" scopulina	
Paratrophon patens	abundant
Lepsiella scobina	
Baryspira australis	
Austrofusus glans	
Mytilus planulatus	abundant.

From here, it is but a few miles to the swift Mokihinui River and thus to Seddonville, where we called on our old friend, Mr Harry Johnston who very kindly told us to make ourselves at home, which we gladly did for the next few days.

That evening, maps were brought out and plans discussed, for we were at last in the heart of the Paraphanta country.

Saturday was bright and clear, so that a visit to the Paryphanta lignaria rotella locality was decided on, a couple of miles up the road and into the bush above the old State Mine Several hours hard work among the razor-edged "toe-toe" and thick undergrowth produced a few dead shells but not a living specimen did we find. The following day proved to be not much better, when, in company with Harry, we had a look at Radcliffe Ridge, the locality for P.lignaria johnstoni, though here a few living juveniles were seen but not collected, in the fern alongside the edge of the bush. Down near the flats in thick fern above the road, several live hybrids were found.

On the 8th, after crossing the Mokihinui Bridge, several like-looking spots were tried on the winding road up to Karamea Bluff for the beautiful P.lignaria lignaria. Again our luck was rather poor, only two or three living and some good dead shells turned up. There were many dozens of specimens lying around everywhere, most being completely ruined due to those Terrors of the Timber ! the Wekas..., having done their dirty work! From here, only a short distance down the road, is Corbyvale, where we met a local farmer, who kindly gave us further advice. We struck off across his farm to the headwaters of nearby Falls Creek, where signs of P.lignaria lusca were soon in evidence. This subspecies proved to be quite common, most shells being dead, though in comparatively fresh condition. A peculiar feature here being that the shells were almost untouched by the wekas.

Tuesday 9th, we sped back to Westport, where a rental car was collected, then out to the local airport to await the arrival of Mrs.Gardner and son Keith from Auckland. As we had time to spare a visit was made to nearby Carter's Beach, but it proved to be fairly bare, only the following common items being collected ...

Spisula aequilateralis	(washed up complete)
Dosinia subrosea	(" " "
Amphidesma subtriangulatum	(" " "

Our party now complete, away we went north to the coast again, through Seddonville, on over the Ranges, dropping down to the coast once more at the Little Wanganui River, and thence 12 miles to Karamea, which was to be our headquarters for the coming week.

Next morning, from a pleasant camp site on the banks of the Oparara River, just north of Karamea, we took a stroll up a track to look for the dark P lignaria annectens. We hunted long and hard before finding a few live specimens, and these were on the track itself, under clumps of tussock.

The floor of the forest hereabouts was almost bare of undergrowth etc. due, no doubt, to numerous deer, consequently the ever present wekas have given the poor snails a terrific hiding.... a sad story, all too common we found, in many localities. During the afternoon we scouted around Karamea for possible information on the Upper Karamea River, and were lucky to find a farmer, a keen deerstalker, who knew all about snails in this area.

Weather being favourable, Norman and I were away early the following morning, and after leaving the van at the end of the road, donned packs, took to our scrapers and four hours sweated it out. For and hour or so the track was quite good, but it began disappearing with ever increasing frequency until, for the last couple of hours we were boulder-hopping beside the turbulent water. By this time, well above the mouth of the wild Kakapo, we had arrived at a deep dark pool, across which we swam, pushing our lilos before us with our clothes on board. From this spot, was just a short hike up a side creek where we soon found signs of Paryphantas. Here again the confounded wekas had been at work, but during the afternoon we managed to find some nice live specimens under clumps of blechnum fern. Now this particular species, with a large shell, axially banded in orange and black, has been named as P. lignaria oconnori, but it is now thought to be distinct. It has, I believe, also been recently collected on the Wangapeka Saddle by a party from the Canterbury Museum.

Upon returning to the banks of the Karamea near sunset, we recrossed and set up camp on a sandy beach. In the morning we hoped to have another look around the vicinity. However at the crack of dawn, down came the rain, so we took off for home at a fast hop... just as well too, for it rained continuously for the next two days and nights, and the Karamea came down in high flood! On arrival back at civilization after a soggy tramp, we were rejoined by Mrs.Gardner and the boys. As camping was definitely out, we made a few enquiries around and were lucky to obtain the use of a vacant house close to town. Here we holed up for the next couple of days while it rained as if it would never stop, though we did have mushrooms for breakfast, dinner and tea!

On Saturday the 13th, though still pouring, we had a look in a small stream nearby which was packed with fine freshwater mussels, of the elongated variety, near to Hyridella menziesi. In the afternoon we decided to try the rocky point south side of the Little Wanganui River mouth, but as we were obliged to cross Glasseye Creek which also joins in here, we were foiled as by now it was swift and deep. However, on the track alongside the creek, we were surprised to find many freshly dead P. lignaria lusca, with the odd live specimen here and there, so that our excursion was not entirely unrewarded.

At last the old sun shone again next morning, so we went back several miles north to the Oparara River to Break Creek for another hunt for P. lignaria annectens.

Here we found another farmer who kindly took us up onto the ridge near his house, where some fine large snails were seen feeding after the rains. (one beauty was actually fastened onto a hefty 6 inch worm !) The wekas had been active here also, although not nearly as bad as at the Oparara River, perhaps due to the much thicker ground cover.

Came Monday 15th, and it was time to be heading back to Seddonville. On the way we turned off for another try at Little Wanganui Point, and this time we were successful. It was found to be an interesting place, particularly for limpets, the terrain being a jumbled mass of boulders backed by high cliffs.. here we collected the following species...

Cellana radians	extremely variable
" " " perana	large, clean
" ornata	small
Patelloida corticata	
" " " " corallina	
Notoacmea pileopsis	VERY SMALL
" daedala	
" helmsii	small, clean
Siphonaria zelandica	small
Benhamina obliquata	large
Melagraphia aethiops	large, clean
Cavodiloma coracina	
Zediloma arida	large, clean
" digna	" "
" atrovirens	" "
Lepsiella scobina	
Lunella smaragda	large
Buccinulum multilineum	small
Mytilus planulatus	clean
Aulacomya maoriana	"

Back at Seddonville, Mr Harry Johnston again made us welcome, not even turning a hair at the sudden invasion of an extra 5 travellers partaking of his hospitality .... in fact, he tells me he feels all the better for it!

The following morning in company of Harry, we took a run up into the back country to the Charming Creek mine, then a tramp along the tramway to a further colony of P. lignaria johnstoni. Here we were most happy to note that none had been touched by the wekas ... a very pleasing find in these parts! The shells were in no great abundance, perhaps the lives were well hidden away due to the abnormal dryness. We found very few, plus some good empty specimens, after a long search.

Wednesday 17th we spent poking around on the north side of the Mokihinui River, in the hills near the mouth, for further P. lignaria. Good shells were particularly difficult to find, as the wekas had again cleaned them up wholesale, and in addition, the area is being milled for timber, which isn't helping the snails to survive either. Along the north bank towards Seddonville, were many bits and pieces of mixed hybrids, but nary a living soul to be seen. Along here is a small side creek, we found more freshwater mussels of the H.menziesi type, rather smaller and thinner shells than those from Karamea.

For the last day of our stay hereabouts, we motored down the coast a short distance to the vicinity of Nikau Point, and while Mrs Gardner and the boys amused themselves on the beach Harry took Norman and myself away up onto the range behind to investigate conditions amongst the Paryphanta lignaria johnstoni there. However, after several hours, we were most disappointed to see nothing but ruined shells throughout, and it appears that the colony is now almost wiped out by these birds, despite the excellent cover of ferns and tussock.

And so time came for us to say farewell to Harry Johnston and his paryphantas, though with regret, after such an interesting and enjoyable stay. Once more we sped south to Westport, where Mrs Gardner and Bernhard left by plane for home, while Norman, Keith and I continued on the final stages back to Wellington.

That same afternoon we took the coast road between Westport and Greymouth, finally pulling in to Woodpecker Bay, near Fox River, ... amongst delightfully rugged west coast scenery. Collecting here produced ..

Cellana radians	Patelloida corticata
" " perana	" pseudocorticata
" ornata	" corticata corallina
Radiacmea inconspicua	Notoacmea pileopsis
Lunella smaragda	Benhamina obliquata
Zediloma digna	Melagraphia aethiops
Anisodiloma lugubris	
" " " " lenior.	Argobuccinum tumidum
Paratrophon patens	Melaharpe cincta
Mytilus planulatus	" " oliveri
Aulocomya maoria	Cryptoconchus porosus.

Saturday 20th saw us returning through the Buller Gorge and a few miles north of Murchison, we turned off 8 miles to Lake Rotorua, a twin to Lake Rotoiti, in the Nelson Lakes National Park Here, in the crystal water of the lake outlet, could be seen many very large freshwater mussels, but too deep to reach. However, I finally made the plunge, gasping in the icy water, and came up with some beauties! After collecting a load of choice yellow plums by the roadside, we carried on over the saddle to the Wairau Valley again, and here at a place called Red Hills, we noticed a large pond in which was flourishing a clump of huge white water-lilies. On closer inspection, this pond proved to be packed with Physastra variabilis, Poyamopyrgus antipodum zelandiae and Sphaerium novaezelandiae, all of which had no doubt been introduced together with the lilies, though now thoroughly established in this unlikely spot.

After our last camp at the Wairau Bridge, we proceeded on to Spring Creek, near the Blenheim-Picton highway. Delving along the edge of this deep and swift stream, we soon had a collection of nice clean specimens of typical Hyridella menziesi mussels. Alongside the road here, patches of grass and rubbish had been burnt and Norman noticed abundant dead specimens of a large Charopid.. possibly Charopa coma ... a surprising habitat for such as these. The for a look at the local coast line we decided on Rarangi... some 14 miles to the north-east of Blenheim ... where the rocky headlands and shingly beaches of the Marlborough Sounds begin. Though we had to wait some hours for the tide to recede, we were happy to find the following species....

Cellana denticulata	Patelloida corticata corallina
" ornata	" " "pseudocorticata
Radiacmea inconspicua	Buccinulum strebeli
Lepsithais lacunosus	Argobuccinum tumidum

And so it was time to be heading for Picton, where at 6 p.m. we boarded the ferry for Wellington, thus bringing to an end a most enjoyable, though all too brief, "West Coast Holiday"

Laurie Price.

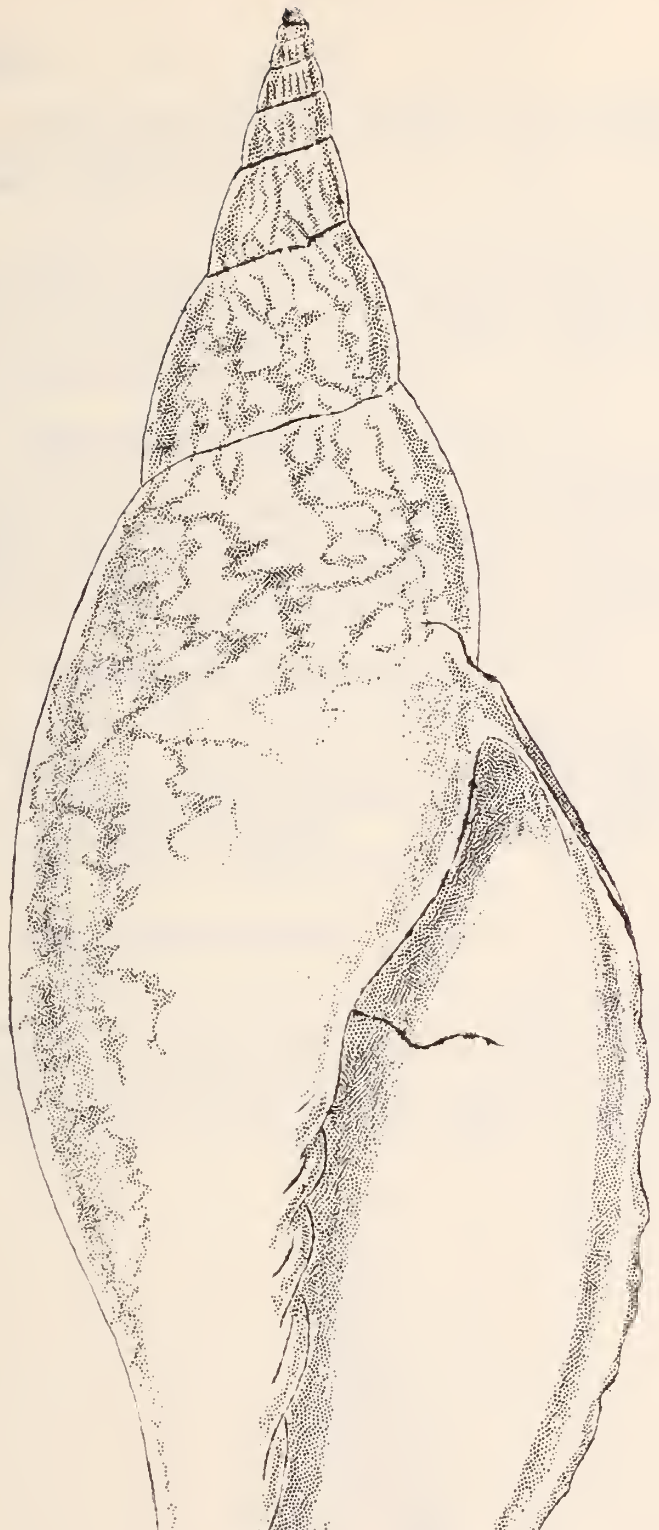
--oOo--

A NEW SPECIES OF ALCITHOE.

A new species of Alcithoe, closely resembling the New South Wales Mesericusa sowerbyi, but more closely allied to A. ostenfeldi Iredale. The specimen figured in the collection of Mrs.J.B. Johnston.

Both this new species and A.ostenfeldi have five plaits but three of them are more prominent than the other two. All other N.Z. Recent alcithoe have five evenly developed plaits. Mesericusa on the other hand has only three strong plaits.

The evenly distributed, not banded, fulminate pattern is similar to that of Mesericusa but the erect protoconch (shown in another specimen belonging to Mrs R.Morgan) is definitely of Alcithoe style. From A. ostenfeldi, which has a very faint pattern in bands or zones, the new species is distinguished by its vigourous all over zigzag markings and its elongate shape with attenuated spire. Information given by Dr. A.W.B.Powell. For illustration by Mr. Hipkins see next page.



(K.H.)

Pervicacia.

Pervicacia is a Genus of the Family Terebridae which is probably noted mostly for its large colourful shells found in tropical regions.

The N.Z. members of the genus are inhabitants of comparatively shallow water, being found from low tide to about 20 faths. in sandy areas. Three species are known from our shores, two far from the Far North, and one which occurs in both Aupourian and Cookian Provinces.

(1). Pervicacia tristis (Desh)

Grows up to 20 m.m. and has axial ribs which are evenly spaced. It is grey or brown in colour with a yellow band above the suture of the whorls. Has a peripheral band on the body whorl. Occurs around most of the North Is. and recorded by Suter from Banks Peninsula.

(2). Pervicacia flexicostata Suter

Grows to 18 m.m. shiny brown in colour with a pale band below the suture. The sculpture consists of irregularly spaced, flatly rounded axial ribs, obsolete on the body whorl. No peripheral band on the body whorl. Cape Maria, Port Waikato.

(3) Pervicacia mariae Powell.

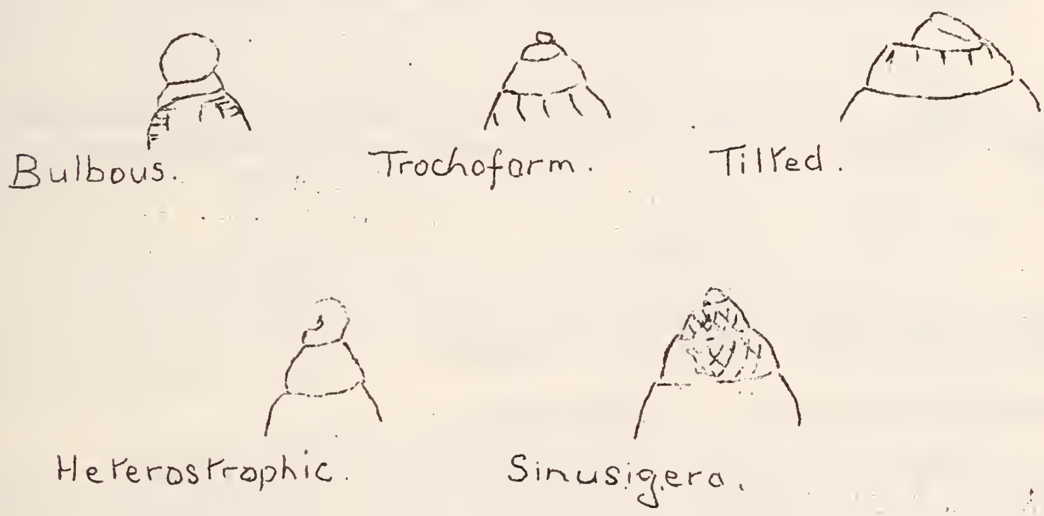
Rather like P. tristis but is larger and broader resulting in a more squarish aperture. The axial ribbing is much stronger. Has a broad spiral band of dark brown on the spire whorls and a narrower one on the base. Cape Maria, Pandora, Maunganui Bluff, Ninety Mile Beach.

<u>A Conchological Term:</u>

<u>Nucleus</u> :- The first part of the shell formed by the embryonic animal. It is seen at the top of the spire and consists of the protoconch (the initial whorl of the gasteropod shell) - usually smooth and cup shaped - and the larval whorls plus the beginnings of the adult whorls.

There are two main types, horny and shelly. The horny nucleus is formed when the larva is in ovi-capsule or egg case. While there, the horny matter begins as a slender cone or elevated point along the axis of the protoconch. As the larva grows the posterior part of the mantle secrets the shelly dome.

The nucleus is not seen in all univalves for it is frequently eroded. Generally it is so small that a lens is needed to see its surface. The nucleus is described as being bulbous, trochoform, melo, heterostrophic (reversed), lateral, tilted, sinusigera and scaphalloid.



(Information obtained from "Illus.Glossary"by P.C.Burch cc of S.C.)

A New Publication

The following paper has appeared in the Records of the Dominion Museum - Vol.4. No.5, entitled "Studies in the Stewart Is. Mollusca No.1." By Mrs.Cedric Smith, Halfmoon Bay, Stewart Is.

" An attempt is made to clarify the systematic position of the named species of Notosetia from Stewart Island waters. New species of Lironoba, Notosetia, Ruapukea, Epigrus, Zeradina AND Conjectura are proposed."

The paper is well illustrated and is a "must" for those collectors working on southern shell sand and dredgings.

OVERSEAS PERIODICALS TO HAND.

Proceedings of the Philadelphia Shell Club Vol 1. No.6.

In it are two papers of a general nature and most interesting :-

" Return to New Caledonia " by May Kline.

" Expedition to Madagascar" by Arthur Holmes.

--oOo--

"Seafari" April '62 monthly issue of the Palm Beach Country Shell Club, contains numerous short articles on Mollusca of that area.

--oOo--

Australian Newsletter Vol.9. No.37.

(Malacological Soc. of Australia)

Is also of varied content. Several titles are listed :-

"The bivalved-gasteropods."

"Land Snails and Egg Masses ."

" Comments on Notocypraea "

The above may be borrowed from the Section Library for a small fee.

--oOo--

Captain Cook's Imperial Sun Trochus

(Astraea heliotropium)

Among the plates devoted to conchology in the first volume of " The Naturalists Repository" published in 1823, Edward Donovan included two finely coloured figures of a pale pink specimen of the shell known as Astraea heliotropium Martyn together with several pages of descriptive text.

Donovan was one of the most prolific writers on natural history in the early nineteenth century, and the general style and phraseology of the text is so completely characteristic of that period that it may be of interest to quote part of his descriptions.

TROCHUS IMPERIALIS
var roseus

" The history of this curious variety of the Imperial Sun Trochus is altogether interesting and deserves explicit mention; it is one among the number of those rare shells which were discovered by that distinguished navigator Captain Cook in his voyages round the world. It was picked up in the Straits that divide N.Z. now distinguished after him, by the appellation of Cook's Straits. Upon the return of Cook to England, he presented Sir Ashton Lever, among other articles of great curiosity, with this particular shell, the only one of its kind he had found. The Imperial Sun Trochus, of an olivaceous violet hue, the shell which constitutes the type of the species, though very scarce, occurred occasionally, but this pink variety only in the solitary instance before adverted to: it was drawn up adhering to the cable of the ship, from the depth, as it appeared, of sixty fathoms water.

In the general computation of the value of the various articles in the Museum of the late Sir Ashton Lever, submitted to the government previous to the grant of the Lottery which transferred to the possession of that Museum from its original founder to the hands of Mr.Park-inson, this shell was estimated at the value of one hundred guineas: and as this value was arbitary, that sum was considered as the worth of the shell while it remain-ed in the Museum. At the final dissolution of this Museum, which took place in the month of May, June and July of the year 1806, this shell like the rest, was submitted to the chance of taste or caprice; It was sold on the last day of the sale, for the sum of twenty-three guineas, an amount considerably below its former valuat-ion, but sufficient nevertheless, to shew that its attractions were still great in the mond of the connoisseur.

The purchaser of this shell was at that time unknown, subsequently, however, the specimen appeared among the property sold at the residence of the Duke de Bourbon immediately after the departure of that nobleman for France, in the beginning of the year 1815--".

The above was taken in part from a lecture by the late Guy.L.Wilkins given at a meeting of the Conch.Soc. of Gt.Britain & Ireland. -11-53 and published in the journal of Conch.Vol.24. No.1.

--oOo--

LOCAL PARS :-

Mrs Worthy reports finding two examples of the subrecent Anadara trapezia from near Waipu Cove. In the Brookes' Collection there is also a specimen from this locality, together with one from the dunes at Doubtless Bay.

--oOo--

Incidentally, Mrs Worthy is doing an independent survey of Molluscs in the Whangarei Harbour and we hope that eventually she will have something for us to run in "Poirieria".

--oOo--

One of the nicest examples of Xenophalium labiatum seen for some time was sent up recently by Mrs.Mabey of Okiwi, Great Barrier Is. Lately she has picked up two specimens, and frequently finds X. collactea.

--oOo--

The N.Z. Cassids. Part 1.

Cassididae is divided into three groups, viz. Cassis, Gadeodea & Phalium.

True Cassis is not known from N.Z., either fossil or recent. Galeodea has been with us from the Eocene and is still represented by a single recent species; while generic derivatives of Phalium are scattered throughout the Australasian Tertiary and have in time given rise to the genus Euspinocassis, the ancestor of our characteristic Xenophalium, which exists both in N.Z. and Australia to the present day.

The local cassids are all active carnivore and exhibit a preference for a fine sandy bottom off shore where the various species of bi-valves upon which they prey, are to be found. They bore a hole through the shell of their victim in the same manner as Natica and Thais.

The embryonic shell has a free swimming larval stage which explains why identical species occur on each side of the Tasman Sea. By the way of the Notonectian Current, fresh stock is continually arriving in this country to keep the salient species pyrum and labiatum true to type.

It is proposed to figure (actual size) in this and the next issue of "Poirieria", all known N.Z. species with locality records etc.

Fig. 1.

Xenophalium matai Powell

Found at Breaksea Sound by Dr. A.W.B.Powell 1934, while he was on a trip to the Sounds aboard the Government steamer "Matai" - hence the shell's specific name. The type specimen is in the Auckland Museum, and is quite unique in that it has the characteristic colouring and outer lip of pyrum, but the overall appearance of labiatum though it can in no way be considered a hybrid.

It is a member of the pyrum group but it is small, more slender, minus nodules and with the columella callus plate less expanded.

--oOo--

Fig.2.

X. labiatum (Perry)

Common in N.S.W. but rare over here. It is found along the East coast from the Bay of Islands to East Cape, and including Great Barrier Is. The shell is of striking colour, the protoconch being pink and the rest of the shell a rather purplish shade mottled with brown and orange. True specimens are perfectly smooth all over and have a very thick outer lip banded with colour markings and very strongly denticulate.

--

Fig. 3. X. royanum Iredale.

Originally descrobed from the Kermadecs, so is obviously of northern origin. Possibly not more than a dozen specimens are known from N.Z. and all were taken about Whangaroa and Doubtless Bay in crayfish pots - the shells being occupied by hermit crabs. The shell attains a height of 5 to 6 inches and a breadth of $3\frac{1}{2}$ inches. It has a heavy appearance and rather tall spire.

--

Fig. 4.

X. ericanum Powell

Found in deep water of Whangaroa and Doubtless Bay, sometimes in crayfish pots. Two or three have been taken by trawlers. It is a bigger shell than pyrum and has a toothed outer lip. The shell is smooth and tall spired. Has been taken in subfossil from shell deposits at Tokerau Beach.

--

Fig.5.

X. finlayi Iredale.

Occurs off the Otago coast in rather deep water. A large thin shell with a tall spire. A distinguishing feature is the deep grooves just below the suture. Rarely seen in good condition.

--

Fig.1.

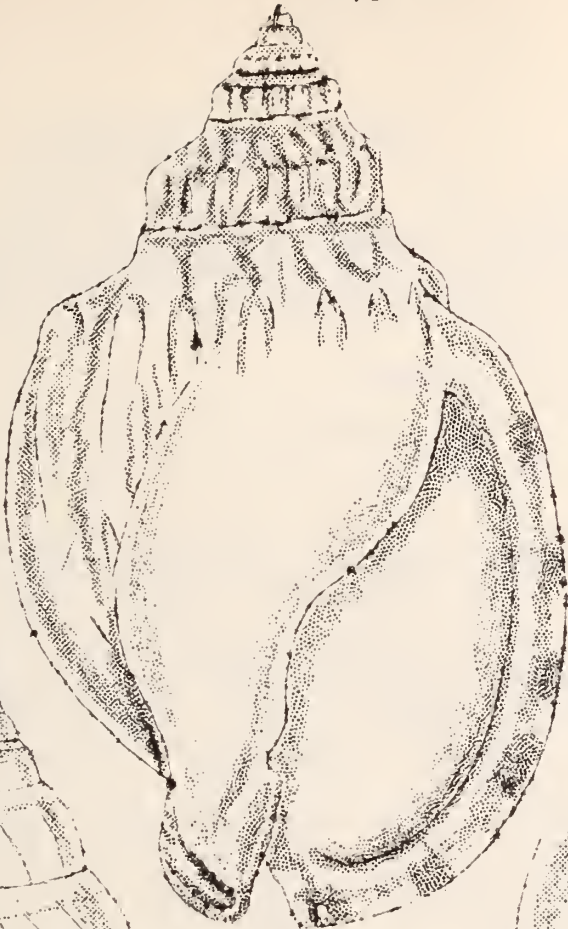


Fig.3.

Fig.2.
2.

Fig.4.

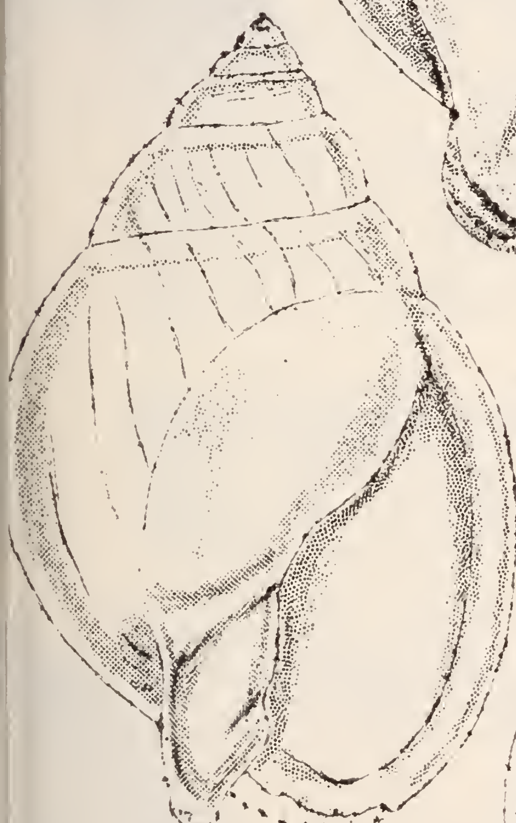


Fig.5.

Fig.6.

Figures natural size.

A.K.Hipkins.

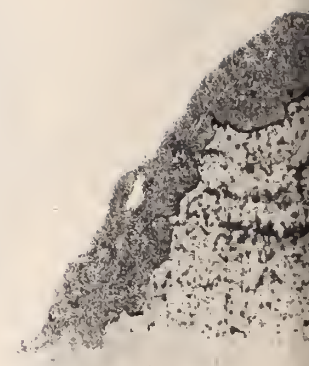


Fig.6.

X.harrisonae Powell

Is from Stewart Is. and which is rather uncommon. It has the colouring of pyrum, but typical specimens are entirely without nodules and have a strongly denticulate lip. Spire and base deeply grooved.

Reprint from Notes by P.T.Warren.

--oOo--

Mrs R, Duffy has sent in a small series of fine photographs which we will arrange to have on show later.

One is of a freak specimen of Struthiolaria papulosa from Waihi Beach - an odd shell which has produced a big, continuous flange with an upward slope, on the periphery of each whorl, resulting in a pagoda like appearance.

Several photos depict a series of Epitonium -like fossils from Motutara Pt. Kawhia Harbour. Of these, Mrs Duffy writes " Hochstetter when he went through here found two species of this shell, and because the second type was not found again until recently, it was thought that a juvenile of the first had been described as the second type."

In addition there is a photo of the primitive Phyllocrinus furcillatus from the Upper Jurassic of Kawhia. This, according to Mrs Duffy " is the second specimen to be found outside Europe. It was found in the Kawhia area in October '58. The first crinoid was found among the fossil remains in a block of mudstone sent to the Geological Survey.

(In case you are not sure what Phyllocrinus is, the information quoted from Wood's Palaeontology " may help. " The crinoidea include the sea lilies and feather stars. The body consists of a stem, a calyx (cup). The stem of the crinoid is more or less flexible and is sometimes several feet in length."

--oOo--

Voluta aulica - a rather rare volute much sort after by collectors, probably owes its popularity to its striking blood red colouring - a really handsome shell. Its area of distribution does not seem to be well defined, though most sps seem to come from the Sulu Sea, which is between the Philippines and Borneo. Zamboanga, on the southern end of the island of Mindanao is often mentioned as a locality. Here the Morro pearl divers come across them. A correspondent on Guam who handles quite a few specimens writes " I have seen four different colour varieties in aulica :- 1. a deep blood red. 2. Light orange. 3. Orange red markings on pink ground colour. 4. Mottled dark pink & white with lines the latter type is usually rather wormy.

Amphidesma ventricosum (Gray, 1843)

To most of us, the mention of Toheroa brings to mind the long sandy beaches of the West Coast, where extensive beds of this famous shellfish flourish. Not a thought do we give to the possible occurrence of the same shell on the more sheltered eastern shore of the North Island.

The first inkling I had of the presence of A. ventricosum on this coast was the discovery of a colony at the northern end of Orewa Beach during August '52. The specimens were small, averaging about 2 inches long and very thin shelled, leading us to believe that they were either recent arrivals on this beach, or were missing the more rigorous conditions of the open ocean beaches normally their home. A more recent check shows that still they have not grown to any extent.

On discussing this problem with Mrs Worthy, Mrs Seager and Mr. Warren, at a recent meeting, I find that they, too, have encountered Toheroa in fairly wide spread localities on the east coast.

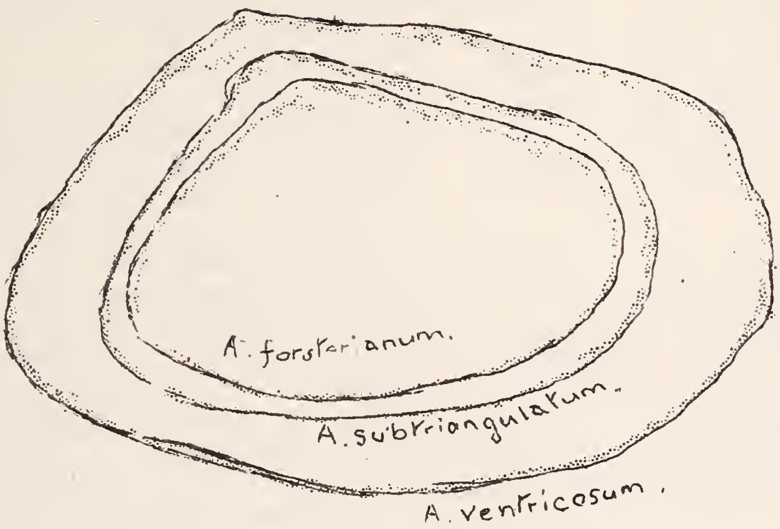
The following records are known to me

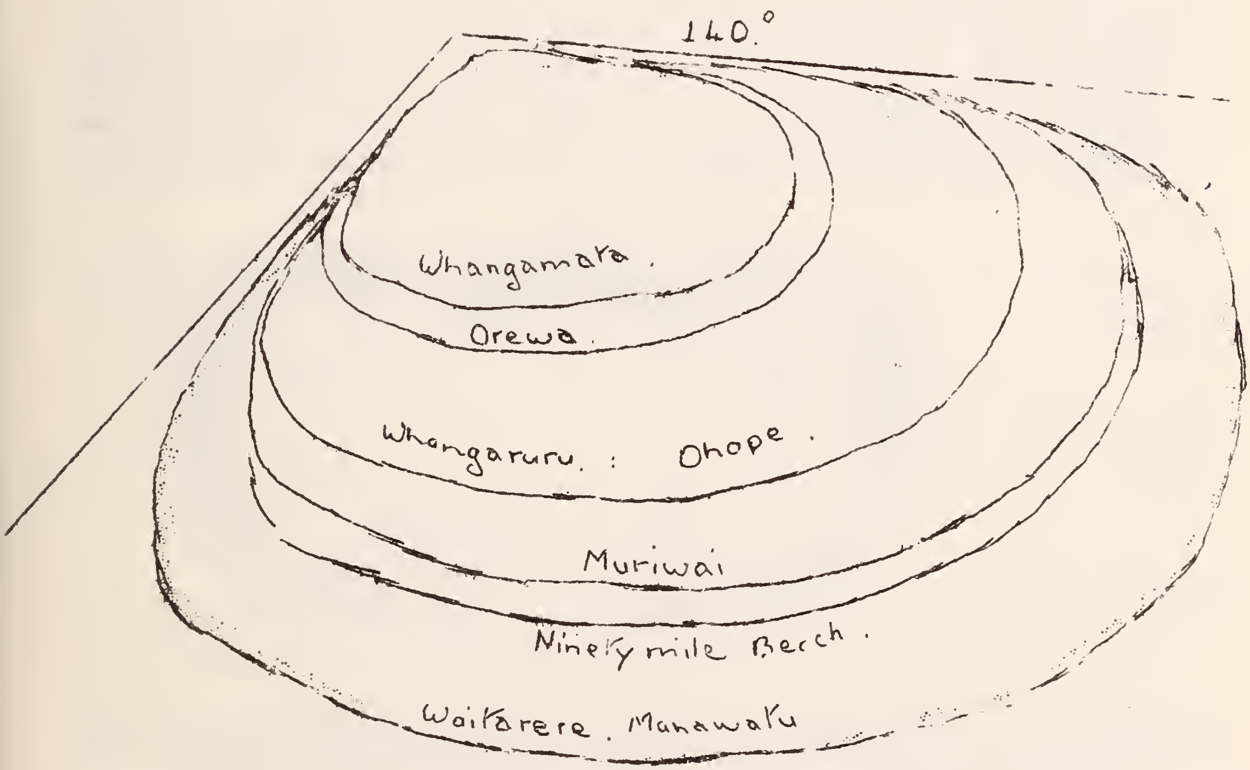
Whangaruru	(Mrs Seager)
Waipu	(Mrs Worthy)
Leigh	(Mr. Warren)
Orewa	(Mrs. Gardner, Mr. Thomson)
Whangamata	(Mr. Taylor)
Ohope	(Mrs. Seager)

The question arises - are these natural occurences or have they been transported at some time by human agency ? While one or two occurences could have been the result of liberation, the widespread distribution as far as the Bay of Plenty would tend to rule this out. Inspection of other eastern beaches would no doubt bring to light more colonies while it would certainly be of interest to know if this shellfish exists south of East Cape.

N. Gardner.

--oOo--


A. forsterianum.
A. subtriangulatum.
A. ventricosum.

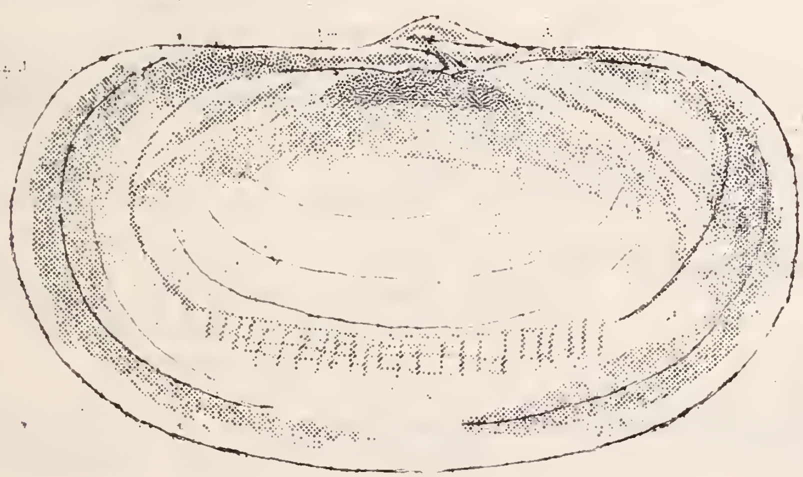

140°
Whangamata.
Orewa.
Whangaruru. : Ohope.
Muriwai
Ninety mile Beach.
Waitarere. Manawatu

Scintilla stevensoni - Powell

This rare Pelecypod mollusc is one of some half dozen N.Z. species all belonging to the family Galeommatidae which extends throughout most tropical and temperate parts of the world. The shells mostly live from low tidal areas to moderate depths, with a few exceptions which live only in deep water; in spite of this they are seldom found cast up on beaches, a probable reason being their extreme fragility. Even in dredgings unbroken individulas are seldom met with.

S, stevensoni was described by Dr. Powell in 1932, from living specimens collected at Whangaroa and since then has been found on rare occasions at one or two other localities on the East coast of Northland. The first Leigh record was of two valves collected by myself in shell sand at Te Rere Beach in March 1949. A valve was found by Dr. Dell at the northern end of Goat Island Beach in January 1962. In June of this year Mr.W. Ponder of Auckland University made a determined effort to find living examples and was successful in doing so. The specimens were located well inside rock crevices near low tide in the consolidated mudstone which forms large areas of rock platforms at Goat Island Beach.

Considerable exertion was necessary to prise off lumps of rock, and after some fruitless searching a complete individual was found, then after that a whole colony in which 46 specs were counted. The majority of these were returned to their home, being too small to be worth taking. The adult shells were removed for study, most



being kept alive in fresh sea water for nearly a week so good opportunities to study their movements were available.

The adult shell is one half inch long and three-sixteenths broad at the beaks, translucent and shining, semi transparent. An extraordinary feature of these molluscs is that when taken alive the shells are found to be fully open and moving about in this fashion with the two valves uppermost and the animal expanded and crawling along underneath more like a Gastropod than a Bi-valve. However as soon as they are disturbed they close up in the ordinary way and remain thus with the animal completely retracted.

Specimens put into a jar of sea water displayed a fair amount of activity and crawled round the side of the glass. The animal has a long foot and siphon and wh when fully extended the mantle covers the outside of the shell. The mantle itself is covered with curious small pointed punctations a little like those we see on some species of Nudibranchs. The animal is a clear white colour and as it covers both sides of the shell this no doubt accounts for the polished and translucent appearance of all the specimens examined.

The N.Z. species are listed hereunder together with all localities known to the writer :-

<u>Scintilla</u> <u>stevensoni</u> Powell 1932. Taupo Bay, Whangaroa (types)
Whangarei Heads, shellsand T.P.W. 1956.
Goat Is. Beach. T.P.W., R.K.Dell., W.Ponder.,
Tryphena Gt.Barrier Is. B.Elliot

<u>Scintillona</u> <u>zelandicus</u> (Odhner 1924) Colville Channel 35 faths.
Hen and Chickens 20 faths
Cuvier Is. 30-40 faths.
Wellington Har. dredged R.K.Dell.

<u>Scintillona</u> <u>benthicola</u> Dell 1956.
Pitt Is. Chatham Is. 330 faths.

<u>Divariscintilla</u> <u>maoria</u> Powell 1932
Awanui Heads. A.W.B.P (type)
Tom Bowling Bay & Spirits Bay (Shell sand)

Divariscintilla c/f maoria Half Moon Bay
Stewart Is. Mrs.C.Smith.

T.P.Warren.

--oOo--

The Eucominia group of Cominella, Gray.

The name Eucominia was proposed by Dr. Finlay in T.N.Z., Vol. 56 as a new genus to cover the Cominelloid species nassoides (Reeve) and its allies. Some subsequent authors have used it as a full genus while others have given it a subgeneric rank, so that it is possible to meet with either usage according to publication. In the following notes it will be regarded as a subgenus of Cominella but to save repetition the species will merely be listed as E. nassoides etc.

The Eucominias are surely the most attractive members of the Cominellidae with the exception of the Fax group which are all deep water shells and practically unknown to amateur collectors. True, some of the group at present under discussion are also from relatively deep stations and are of considerable rarety, but most of them are of coastal or shallow water belt, the chief drawback to their ease of collection being the fact that several of them only inhabit the islands to the south of N.Z. and it is because of this isolation that we do not often see them in collections outside of the museums.

E. nassoides (Reeve) is the most common species and is found at most beaches at Stewart Island. This is a tall spired shell mostly grey or dark brown when in fresh condition though weathered shells turn rather white. In life the shell is oftend covered with small alga.

E. nassoides nodicincta (von Martens) is from the Auckland Islands and is a shorter spired shell and also thicker and heavier. It has a large yellow protoconch which contrasts with the whiteness of the rest of the shell. All the ones I have seen have been dead sps., indeed I have not heard of any live ones being taken, so we can assume that this one lives beyond normal low tide level. In this species the spiral nodules rather tend to grow into axial ribs.

E. filholi Finlay was proposed to accommodate the form which is found at Campbell Island but this is now considered to be identical with E. nodicincta. Another synonymmof this one is C. veneris (von Martens)

E. iredalei is the well-known Chathams representative of the group; a large heavy shell with axial ribs and a big yellow protoconch. Here again there do not seem to be any records of live shells being collected, though dead ones seem to be quite common particularly at Owenga. A great rarity from this same locality is E. ellisoni consobrina Powell, which is probably a sub-recent shell. So far as is known, no more specimens of this have been collected lately.

E. nassoides foveauxana Powell is the benthic relative of the Stewart Island species and is often taken from the oyster dredges. It is a much smaller shell than nassoides typical and the colour is rather better being quite a bright shade of brown. Compared to nassoides the aperture is always much wider and the body-whorl proportionately shorter.

E.haroldi Powell 1946 is rather a handsome small shell with a buff-brown coat ornamented with white nodules; it is rather like a miniature iredalei but as haroldi is from the southwestern area of the South Island and Fiordland there can be no confusing the two so long as they are from definite localities. Powell remarks that haroldi is easily distinguished by the uniform dense spiral striations and absence of spiral cords on the spire whorls.

E. otakauica Powell, 1946 is a large deep water shell from the eastern coast of the South Island between Otago and Banks Peninsula and is mostly found at depths between 20 and 60 faths. The shell has a taller spire than nassoides and a proportionately smaller and more rounded aperture. The inside of the outer lip is always smooth whereas in nassoides it is nearly always lirate. The ground colour is buff sometimes streaked with reddish-brown. A large spec. can attain a height of three and a half inches.

E. marlboroughensisPowell, 1946 is a very rare species from the southern Cook Strait area and is not much over an inch in height, being rather of the style of the subfossil elegantula which is a small thin shell from the Castlecliffian. The shell has axials rather than nodules and is of a brownish-grey shade in all specimens I have seen.

A very beautiful shell is E. olsoni Dell 1956 which is known only from five specimens all dredged from the Mernoo Bank (which is off the Banks Pen. coast) in 40 to 60 faths. The basal colour of the shell is a lovely pinkish brown and the nodules are clear white, the whole shell having a most pleasing appearance to the eye. The largest specimen in the Dominion Museum is about two and a half inches in height, with a breadth of one and a quarter inches.

All the Eucominias so far described are from localities from the south of Cook Strait, however there are two or three as yet undescribed species in our museums and one or two private collections. These will some day be dealt with when more specimens come to light, in the meantime it is very interesting to note that a couple of examples of one form are known from deep water stations in the eastern Bay of Plenty.

NEW PAPERS AND PUBLICATIONS

Native Sea-stars, by Dr.H.B.Fell, published by A.H. 7 A.W.Reed,7/6

Native Sea-stars is another of Reeds' Nature in N.Z. series. The author has had a large amount of technical work published as a result of his study of echinoderms (sea-stars & urchins) and in this book he has shown his ability not only to write in a not-so-technical manner for the amateur scientist, but to illustrate his work with about 50 drawings of the sea-stars discussed.

The book could be used as an instruction manual by any one keen enough to start a collection of sea-stars, or merely as a means of identifying interesting sea-stars found during a beach walk. There is a guide on how to go about studying and making a collection of sea-stars and instructions on setting up a small marine aquarium suitable for a schoolroom, even one well away from the sea.

--oOo--

MARINE SHELLS OF THE WESTERN COAST OF FLORIDA.
Louise M. Perry and Jeanne S.Schwengel.

Revisions and additions to Louise M. Perry's "Marine Shells of Southwest Coast of Florida". Chapters on generalía, collection, and preparation of specimens with clear, definite descriptions of species. Beautifully illustrated by photographs in black and white, including many pictures of egg capsules, eggs, egg collars, embryonic shells, and embryos of gastropods.

262 pages, 55 plates, 1955.
Paper bound 6 dollars. Cloth bound, 7 dollars.
(Add 34 cents for foreign postage).

--eOo --

Mollusks of the TROPICAL EASTERN PACIFIC.

Particularly from the Southern half of the Panamic-Pacific Faunal Province (Panama to Peru)

PANAMIC-PACIFIC PELECYPODA
by
Axel A. Olsson.

572 pages | 86 beautiful phototype plates.

Contains thorough descriptions with keys to the living pelecypods of the area Panama-Chile. Founded on first hand collecting of Recent and fossil shells of the Central American and South American coasts and of study of type specimens in the Museums of Europe. Gives a discussion of the eastern Pacific shores, currents, explorers, and habitats based on personal expeditions. 15 dollars 19c.

WEST COAST MOLLUSKS

Type Specimens of Marine Mollusca described by P.P.Carpenter, from the West Coast. (San Diego to British Columbia.) (Mem. 76-Geol.Soc.Am.)

by
Katherine V.W.Palmer.

V1+376 pp., 35 pls. 1958

More than 270 species are discussed, and over 190 shells are illustrated including common West Coast species. Distribution of species and nomenclatorial notes on species and genera are included. Original data on all types of the Carpenter species and historical background of Philip Carpenter are given.

TO quote : "Essential information, painstakingly assembled and most beautifully organized".

Cloth bound 8 dollars, 69 cents (including postage)

--oOo--

The three publications above obtainable from :-

Paleontological Research Institution
109 Dearborn Place, Ithaca, New York.

--oOo--

It is highly probable that future dredgings could extend the northern range of the group still further, while it will be interesting to find what forms still await discovery in the depths between East Cape and Cook Strait.

T.P.W.

--oOo--

Some new pamphlets and booklets of Australian Recent and Tertiary Species of the Molluscan Families of Australia, author Bernard C. Cotton. F.R.Z.S., Curator of Molluscs, South Australian Museum have been received.

These include the following families :-

Volutidae - sub family Volutinae.
Olividae
Strombidae
Conidae
Mitridae
Muricidae
Cassididae
Potamididae
Buccindae
Fasciolariidae
Littorinidae
Cymatiidae
Thaididae

Some of these publications are revised from those printed at Adelaide 1954 and could be of much help to collectors of Australian shells.

These may be obtained from Secretary,
Royal Soc. of South Aus.
Adelaide.

--oOo--

WATTLE BAY. October 1962

Manakau Harbour Survey.

Glorious weather and a low spring tide, 0.0 at 3.15.p.m. and what more can a conchologist ask ?? Cars were soon on the way and twenty-two members and friends looked forward to a good days shell hunting.

Wattle Bay is reached by a long windy road from Waiuku, and lies just inside the South Manakau Head. It is a lovely stretch of sand with some muddy patches, a sandstone shelf and towards the Head at the western end are large and small rocks. A small reef towards the western end is quite a productive area.

Lunch over, interrupted by a top dressing plane which persisted in flying off the ground about 20 yards away and right over the heads of the party and their cars, seemingly close enough to reach up and touch, and so members split forces some making their way towards the South Head, and others combing the nearer rocks reefs and sandy patches.

Turning rocks close at hand, juvenile Penion adustus adustus (Philippi), Buccinulum heteromorphum heteromorphum,Powell were found both dead and alive. In the same area B. multilineum multilineum Powell and another specimen of Buccinulum now identified as a colour variation of B. multilineum. This was an almost white specimen.

On the seaweed on the reef and beyond were large numbers of Maurea punctulata stewartiana (Oliver) (= urbanior Finlay) and less frequently M. punctulata punctulata (Martyn). The former were exceedingly fine specimens.

In the sandy and muddy areas as the tide turned the following specimens were seen breaking the surface :-

Alcithoe arabica	live	
Macomona liliana (Iredale)	live	
Cyclomactra ovata (Gray)	"	
Myadora striata Q & G	"	large specimens
Struthiolaria papulosa (Martyn)	"	" " adult.
Struthiolaria vermis (Martyn)	"	few specs. more dead.
Zethalia zelandica A.Adams.	"	1 lone sp.
Baryspira australis	"	plentiful but very small

On and under the rocks almost at the South Head were :-

Cominella quoyana (A.Adams)	live	
Paratrophon cheesemani (Hutton)	"	
Austrofusus glans (Roeding)	"	
Chlamys zelandiae (Gray)	"	large strongly ribbed
Janthina violacea (Roeding)	"	with raft attached,
Maurea tigris (Gmelin)	"	small sp. on seaweed deep down.

On rock cliffs at high tide mark, Siphonaria zelandica Q & G, and tween tides Cellana radians (Gmelin) were found.

Neothais scalaris (Menke) and Perna canaliculus (Gmelin) were fairly common although small. Lepsiella scobina on high tidal rocks, and Cavidiloma coracina from high to mid tidal rocks.

At the Western end of the Bay one large specimen of Maurea tigris was found washed up.

In the sandy mud Cominella adspersa Brugiere
" " melo (Lesson)
" maculosa (Martyn)
" glandiformis (Reeve) all
were plentiful, fine specimens and clean.

Haminoea zelandiae, Gray, alive and dead in rock pools mid tide.

Maoricolpus roseus manakauensis Powell, were plentiful many alive, with their spires well down into the sand.

In the sandstone were collected Notocorbula zelandica Q & G, alive, Notopaphia elegans (Deshayes) and Anchomasa similis.

This area is worth another visit, as the number of members present was inadequate to cover the ground thoroughly. An extreme low tide is necessary to reach the sandy areas around the seaweeds. A large party well split up and covering the ground from the South Head, back to Wattle Bay and on to Big Bay would prove productive. As one of the members present at the last field day I can say that the long trip, hot, dusty and winding though it was, was really worth the effort, apart from the fact that the Manakau Survey was being assisted. I am sure that all members will gladly assist should Mr. Hipkins require any of these specimens, as our contribution to the Manakau Survey, and in the end benefit the Auckland Institute & Museum.

L. Seager.

--oOo--

ETHICS of a SHELL COLLECTOR.

I firmly believe that those who investigate the lives and habits of molluscs form a sort of friendship with them and are less likely to clean out colonies deliberately. Long ago I made a rule for myself that I would carefully clean and take care of every single shell that I took alive, no matter how small. This includes replacing tiny opercula (otherwise why take them alive?), removing all the worm tubes and barnacles, and other tedious chores.

After hours and hours of preparing shells, one begins to be very careful of the numbers he takes. If one has no use for quantities of shells, he should not take them, for it is true that the removal of a single specimen from a locality requires an adjustment to be made all along the line of life. The various living things of the smallest area have formed an interdependent, closely knit group, each looking to others for food or for protection from the enemies which would consume him.

By Virginia Lee. Reprint from Seafari, Palm Beach County Shell Club.

--oOo--

THE NORTH CAPE AREA.

To Conchologists, the Far North is always an area of great interest, and I never willingly forego an opportunity to taking a walkabout in these parts. Consequently, a hot January day saw Laurie Price and myself establishing an advance base at Kapuwairua, on Spirits' Bay, in preparation for a tramp over the hills and around the coast to North Cape.

A vicious battle during the night with Spirits' Bay mosquitoes (nets only infuriate them) ensured that we were ready for a fairly early start on the first leg of our journey. With sizeable packs we climbed up past the waterfall bush, through grass and scrub until the Summit of Unuwhao was reached at approx 1000 feet. From there one gets a grand view of the Northern coast line from Cape Reinga to Kerr Point near North Cape. The eastern side of Unuwhao is bush clad, and we scouted around for a few minutes until we found a good track which runs along on top of a bush clad saddle which reaches across to a further distant ridge clear of bush. About half way along this track is the type locality for Placostylus ambagiosus annectens, the largest of the ambagiosus group. Though this was plentiful at the time the type material was collected, it is now very scarce, due to the ravages of wild pigs which seem to have increased in the last few years. Much of the flax which was their normal cover, has been rooted right out of the ground. Odd specimens of Paryphanta watti were collected here in the past, but only Rhytida and Liarea could be located at this time.

When the second high ridge was duly reached, a descent was made to sea level at a delightful spot known as the Huka, a small bush clad gully with a little stream running out over the sand. It was our intention to stop here awhile and do some collecting on the way back, so we pushed on along the sandy bea[ch] (the only shells washed up were Cookia sulcata) until we came to a rocky bluff. We were able to pass around this as the tide w[as] low. This area is known as Takapau Kura and has in the past produced very good shell sand. It is the type locality for Zelaxitas alta and such shells as Zemitrella fallax. Z. laeviros[tris] Ividella macria, Striatesta eulima and Lironoba anomala can be so[rt]ed out of the shell sand which washes up into crevices and rock pools.

Here we spied a fair sized fish in one of the pools so with the view to supplimenting our food supply we waded in and gave chase. To catch such a fish we discovered, was not quite as easy as it looked. We dashed around and around the pool, and I slipped in - but we caught the fish, though walking along the beach afterwards in wet, salt laden clothes was far from pleasant.

Tom Bowling Bay is a long sandy beach and we seemed to be trudging it for ages, with no shells to be seen. Behind the dunes of this Bay is a low swampy area a mile wide known as the Waikuku Flat with Waikuku Beach on the western side. The Flat was the scene of much gum digging in earlier times and pits and trenches are still to be seen. At the North Western end of the Flat the country rises up to the North Cape Block, 6-700'. We climbed up onto this and followed along the top of the cliff until we came to Kerr Point, N.Z's most northerly point. Just behind Kerr Point is a pan of ironsand, a harsh area where vegetation is dwarfed. This is the type locality of Placostylus amb. michei, a small thin shelled race with a lighter epidermis than the others. Always very scarce, it is now even harder to get. Strange to say, one of our rarest small land snails - Delographia cordelia exists rather commonly at this area - very nice specs with flame like markings. It is also the only area in which Liarea aupouria tara lives and very common it is too under the stunted vegetation. Much of this area has just previously been burnt over by the Maoris and though charred dead shells were seen of Placostylus, no live examples were encountered. Even over the cliff face where Dr. Powell and I had collected some years earlier and which supported a fair colony, the shells were gone , wind had gained a foothold and where there had been a generous covering of vegetation, now there was only red earth and rock.

As evening was approaching after our long tramp, we decided to make our way down off the high land of Kerr Point, and set up camp at the north end of Waikuku Beach - where a small stream flows out. We bedded down and slept very soundly. Next morning just near the camp I picked up a nice specimen of each Cabestanamorpha exer ta, and Zegalerus tumens.

Our plans for the morning were to hunt on the hillside towards North Cape Lighthouse, and we had to "boulder hop" the whole way. There were few marine shells - Cookia sulcata, Lunella and Zediloma chiefly. Above the beach on the rather steep hillside, we searched in a small area of Karaka trees and flax - a profitable spot where many Placostylus amb.watti, Rhytida d. virens and Liarea aupouria were encountered. As the Placostylus lived under jagged rocks they were rather worn with patchy epidermis.

Retracing our steps and picking up our gear at the camp site we proceeded along the flat sandy Waikuku Beach. Here, there had been a small washup of shells, the best items being Architectonica reevei and Alcithoe depressa.

At the South end of Whareana Beach is a stream banked up by sand forming a small lagoon which runs back into a steep bush clad gully hardly visible from the beach. This is the home of Placostylus amb.whareana. A short climb up the hill-side and into the bush enabled us to add this species to our bag It is reasonably common this sub-species, though mosquitoes make collecting decidedly unpleasant. This snail has thick heavy apertural processes and is to myn way of thinking one of the nicest sub-species. Rhytida and Liarea also occur here.

We made camp, and while waiting for the evening meal to cook, investigated the lagoon. Waist deep in cool water, we collected examples of Gundlachia, a small limpet like shell, fou on the under sides of the water lily leaves. As this seemed a suitable spot for mosquitoes, sleeping bags were unrolled in the dunes well along the beach away from our camp. The one disadvantage of sand is that is becomes very cold in the early hours of the morning.

Away to an early start next morning, we climbed up at th Southern end of the beach onto a coastal ridge covered with stunted ti tree and fern. Some distance along and on the South side of the ridge is an area of bush which had not been previous ly investigated. Here, after searching for some time, we found an unrecorded colony of Placostylus amb.hancoxi - not a dense one but thinly scattered over a fair area. Previously this sub-species was known only from a small patch of bush clos to the coast and nearer to Maukins Nook, where only 7 or 8 specimens had been found. Rhytida vivens, Liarea aupouria, and Phrixnzthus scaidium were again present. Having collec examples we trekked back overland through barren gum land to th Western end of Tom Bowling Bay - quite a distance. Here, f the consolidated dunes we gathered up some of the subrecent sub species Placostylus amb. gardneri, then walked back along the shore until we reached the Huka, our camping place of the third night.

The stream which flowed out here fascinated us - in a deep pool the water was quite hot but with six inches of cold water on top.We enjoyed some little time up to our necks in the pool - most refreshing after a good days tramp.

Placostylus amb. annectens the largest sub species has been recorded from here, but on the western side of the stream, where it is scarce. A sizeable colony exists on the eastern side. Further up the stream, specimens of Hyridella menziesi the freshwater mussel, and Melanopsis trifasciata were collected. Samples of Potamopyrgus were taken too for comparison with others.

During the night it clouded over and the wind rose (no mosquitoes) and looked like rain, but seemed brighter by morning. We started on the final leg of our tramp, up to the high ridge behind the Huka, across the bush clad saddle to

Mt. Unuwhao and eventually down to the sea level again at Kapuwairua, where we settled down to a m ore civilized form of camping.

Norm. Gardner.

--oOo--

A CONCHOLOGICAL TERM.

WHORLS :- A complete turn or revolution around the imag- -inary axis of a spiral shell. The last whorl is called the body whorl. The whorls are described as non-contiguous when they do not touch each other, continuous in the opposite case.

They are therefore depressed when they are flat, can be angulated, keeled or coronated, distinct or indistinct. They are sometimes, as in Cypraea hidden by the enlarged body whorl.

The following are used to describe the type of whorls :-

Angulated, continuous, constricted, disunited, coronated, depressed, detached, distinct, globose, hidden, keeled, ribbed, rounded, shouldered, subulate, ventricose.

Width of shell is measured acsoss aperture and bodywhorl this being the widest part of the shell.

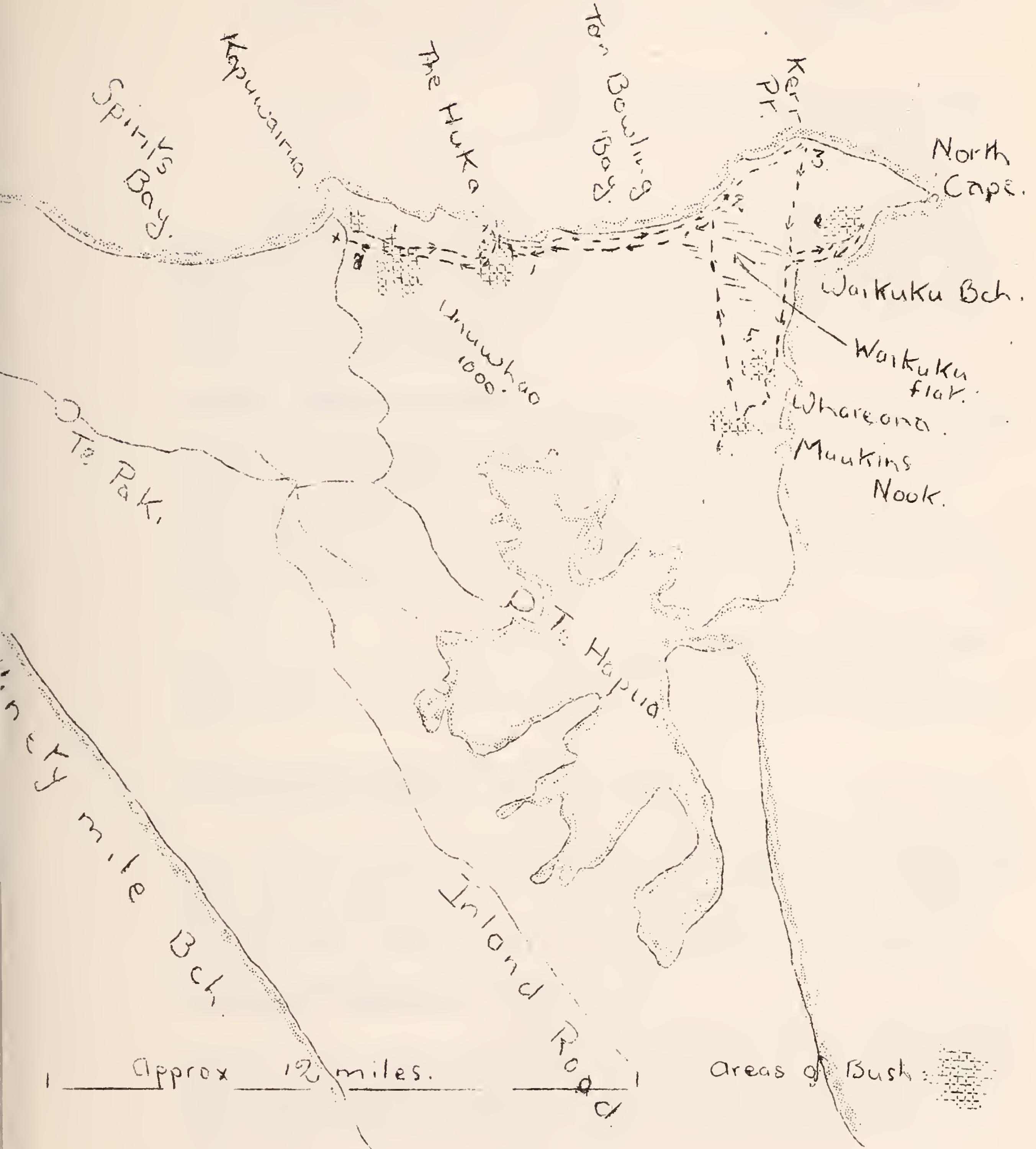
Examples :-

depresses	- Planorbis
angulated or keeled	- Rhytida dunniae
disconnected	- Spirula spirula
globose	- Natica
coronated	- Nassarius acteanus
shouldered	- Conus
subulated	- Pervicacia tristis
hidden	- Cypraea
ribben	- Zeacumantus

(Information obtained from Illustrated Glossary by P.C.Burch S.S. of S.C.)

--oOo--

THE FAR NORTH OF N.Z.



1. Placostylus ambagiosus annectens
2. " " " gardneri.
3. " " " michei.
4. " " " watti
5. Placostylus ambagiosus whareona.
6. " " " hancoxi.
7. " " keenorum.

Comments on Fleming's "Notes on N.Z. Recent and Tertiary Mussels"

Trans.Roy.Soc.N.Z. Vol.87.1959

--oOo-- Bill Rudman.

Although Dr.Fleming's notes were mainly concerned with the Tertiary mussels, his notes on the Recent ones makes clear the changes which appear in Dr.Powell's new check list. Dr. Fleming's notes were based on the work done on the Mytilidae by the late Dr.Vion Soot-Ryen of Tromso Museum, Norway.

<u>Mytilus edulis aoteanus</u>

The species that Dr. Powell in his check list referred to the Australian "planulatus" has become a sub-species of Mytilus edulis as has its Australian relative. The Australian becomes M.e. planulatus while the N.Z. form is named M.e.aoteanus. Dr. Powell found that M.e.aoteanus differed from M.e. planulatus in having a larger dorsal slope and fewer hinge teeth.

The muscle scar of aoteanus also appears to be different from that of planulatus and approaches that of the northern form M.edulis edulis.

<u>Perna canaliculus</u> (Gmelin,1791)
Genus: Perna Retzius.

This change of genus follows from work done by Soot-Ryen in 1955. He found that Perna was the oldest name for the group of mussels classed under the name "chloromya". Although Dr. Powell did not, Suter placed canaliculus in the subgenus Chloromya.

<u>Aulacomya maoriana</u> Iredale 1915

Aulacomya is a zonal subantarctic genus. The appearance of A.maoriana in fossil deposits at Otahuhu are in keeping with the theory of cooling in the late Tertiary period (15 million years ago).

<u>Modiolus areolatus</u> }
} Unchanged.
<u>Modiolus fluviatilus</u> }

<u>Zelithophaga truncata</u> Unchanged

Ryenella impactus ;

In Powell's 1946 check list it was Modiolaria, in 1957 it was Musculus. This little mussel appears to have caused a little trouble.

Soot-Ryen found that a number of species of quite different anatomy had been placed under Musculus. M. impactus and a group of mussels similar to it were found to be more inflated and the arrangement of retractor muscles were different to typical Musculus species. He suggested that this "impactus group" should be removed from the Genus Musculus and he suggested Lonistina as a generical name.

Fleming however, says that this name Lonistina (used by Gray in 1847) was a synonym of Musculus. The impactus group were therefore back to where they started. Fleming remied this by suggesting a new name "Ryenella" after Dr. Soot-Ryen. Thus our little "nesting mussel" is now Ryenella impactus.

Gregariella barbata, (Reeve 1858)

Was Trichomusculus barbatus.
Soot-Ryen has synonymised the names Botulina Dall, Trichomusculus Iredale, and Tisialectus Ire., with Gregariella.

Dacrydium (Quendreda) pelseneeri Hedley 1906.

This is a rare species and the type does not appear to be fully mature. Soot-Ryen placed it in Sub-genus: Quendreda Ire. Fleming notes that although Powell in check list (1957) records it only from the Aupourian province in a927 he recorded it from Puysegur Point in the Fosterian province.

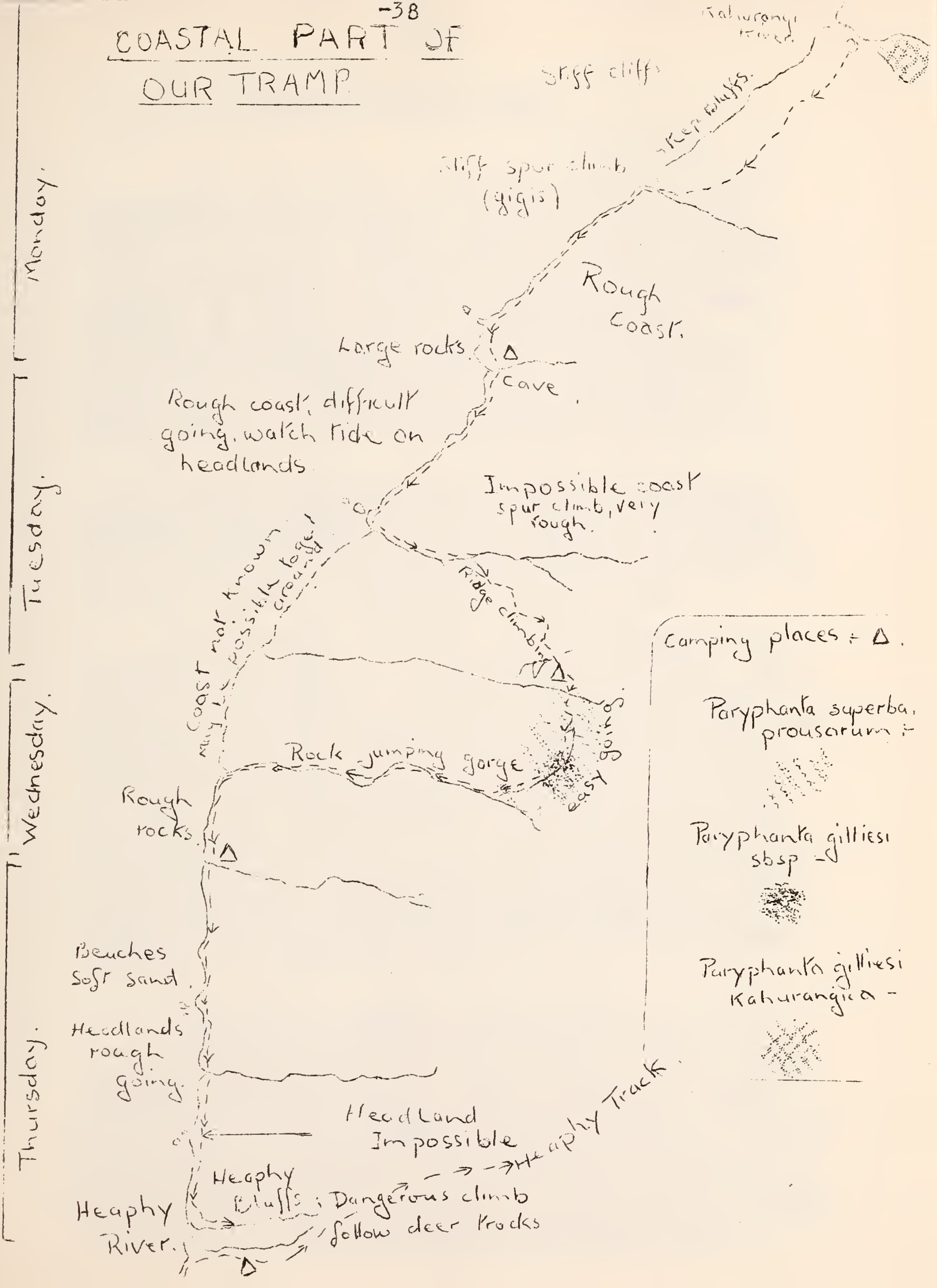
Crenella radians (Suter)

Was Dacrydium radians but its shell shape differs considerably from true members of Dacrydium. A rare northern species.

vPerna canaliculus and Modiolus areolatus appear to be the oldest living mussels in New Zealand and have fossil records tracing back to the early Pliocene (15-20 million years ago).

They could have existed earlier than this, as could have other Recent mussels but there is a scarcity of sediments in the shallow depths and on the rocky bottoms which many mussels inhabit " to quote Dr. Fleming.

COASTAL PART OF OUR TRAMP



January Paryphanta Hunt.

-Frank Climo.

Laden with packs, we left the Anatori River at 2.30 p.m. on Sunday 13th and taking it easy reached Kahurangi Point at 6.p.m. There we tried to catch some fish for tea - and succeeded. While the other boys were fishing I coasted round looking for carb inhabited material. Modelia granosa, Argobuccinum tumidum and several species of Buccinulum were relatively common. I collected one good specimen of Buccinulum striatum, and while collecting was chased off the private domain of an irate bull seal by his nibs. We camped that night in the Marine Dept house now opened by the courtesy of the Dept., for campers.

9 a.m. Monday morning saw us at the Kahurangi River where I collected a few specimens of Paryphanta gilliesi kahurangica. Our next obstacle was a 400 ft face of gigis or kiekie and other stunted scrub leading to a plateau which provides a relatively easy path around a barrier of impassable coastal cliffs.

We had lunch at 12/30, having porgressed only a couple of miles - in a ravine next to the sea. The next hour was tough : A razor-back of gigis and flax had to be conquored - we could not go round to the point because the cliffs dropped straight into deep water At 4.30. (and with several hours and miles of rock scrambling behind us) and approx. 1 mile from Rocks Point I shot a deer which kept us in meat for a couple of days. We camped that night in a bay just on the Southern side of Rocks Point, which had been used for this purpose previously, as tent poles and empty tins etc. signified. Here, amongst the driftwood, I found a good specimen of Paryphanta superba prouseorum, probably washed down from the mountains by one of the numerous swift streams in the area. It was pleasant sleeping under flax that night.

At 6.30. we sandfly bitten trampers started rock hopping for a point in the distance and at 8.40 our rock pathway ended in a sheer cliff. Gigis again! Another hour later and another razoeback behind us we arrived at a small river. After a swim and a spell of clothes washing, I managed to catch an eel on a piece of our venison. It was delicious fried in butter for lunch. The coast at this point looked impossible to follow, so reluctantly the decision was made that we would continue inland until we found a spur running south to the Heaphy. Poor fools !! This spur was not in sight at 7.45 and our altitude then must have been well over 1000 feet.

A couple of events broke the monotony of that afternoons climb. We watched an aerial battle between two native hawks and a harrier, and a little later saw a big stag. Our camp that night, of course, was in deep beech forest.

8.30. on Wednesday morning saw us climbing steadily from our camping locality through beech with an undergrowth of mountain flax and toi-toi. At last! at 10.0 I found my first specimen of P.s.prouseorum in its true environment and later collected 50 more specimens in a damp hollow (a good few acres) on the mountainside. Here I found a shell I did not expect to find - a P.gilliesi type which may be (though I am only being cautious) a Western extention of the Gouland Downs P.jamesoni colonies. I packed 6 good specimens of these home with me. At 1 o'clock and still no spur in sight the coast once more seemed to be our best bet. Five hours later and once more at sea level, I did my best to control myself. I had just seen three deer and had lost my bullets! We saw three more deer before making camp and they all stood and watched us until we were within 50 yards of them. The sandflies were very nice with our soup that night !

We were glad to leave the sandflies behind at 7.30. Thursday morning. Thursday is a day I will always remember. We slogged for hours in sweltering heat along great bays of yielding granite sand with a pile of jumbled rocks (polished smooth by the coarse grit) at every headland just to make our labours more difficult. The Heaphy Bluffs were reached at 11.45 and rather than attack that formidable headland we decided to fish for awhile - once more we caught our tea. At, 5.15, after a really dangerous bit of climbing around the edge of a cliff, we saw the Heaphy Hut a lovely sight. We were not established in the Heaphy Hut that night until 9.p.m. - the river delayed us somewhat. I needed a swim, but I was cold after swimming the Heaphy 7 times and pushing a raft at the same time. Our raft was not very well built and would only carry one pack safely above water level at a time.

Now just a brief summary of the coast as regards mollusca - Hormosira makes its appearance in rock pools and as would be expected there are thousands of Lunella smaragda on the intertidal rocks. The large numbers of Zediloma digna also seem to be directly proportional to the large areas of bull kelp on this coast. There were clusters of this species on washed up kelp fronds in the midtidal zone. The only other marine families I noticed (we were tramping flat out all the way along the coast trying to beat the tide) with any detail were the limpets. There is a good range of them on the smooth rocks.

The Heaphy Track part of our trip has been mentioned before so I will only give a brief summary of collecting conditions.

1. The "Lewis" - Paryphanta superba harveyi
(many small shells but large ones not hard to find).

2. Gouland Downs :- Paryphanta gilliesi jamesoni

a. South:- (strong markings-dark brown.

b. Blue Duck Creek :-
lighter colour, markings not as pronounced (Wekas have taken heavy toll)

Perry's Pass - Paryphanta superba richardsoni

(Hard to find, only found one good specimen medium size).

We arrived home on Sunday and I spent most of Monday cleaning and cataloguing snails.

--oOo--

Amongst a collection of Placostylus shells received recently by Capt.Short from his correspondent on Guadalcanal were specimens of a beautiful small shiny, white species calles sellersi(Cox). These were from 5000' on Mt. Popomanasi in the area of wet mist forest of Central Guadalcanal.

The animal which is green in colour shows through the white shell. At a glance, this shell would appear to belong to the miltochielus group which inhabits San Christoval and nearby islands. P.sellersi has however a rather different aperture, a strong fold on the peristome and is somewhat earshaped or suricular. In fact it is considered by Clench to have closer relationship with P.strangei of Vella lavella to the north.

--oOo--

OUTSTANDING SHELL COLLECTIONS.

By R.Tucker Abbott
Reprinted in part from *American Seashells.*

Outstanding Collections : There are a number of very lovely private shell collections in the U.S.A., some devoted wholly to marine species, others limited to land or fresh-water types. Many represent years of collecting, others an expenditure of many thousands of dollars. To mention a few would be to slight many another. The best private collections are in California, Florida, Connecticut, the New York area and Massachusetts. As time passes, private collections are either sold, lost or left to some public or university museum, so that today we find the largest collections housed by public or endowed institutions.

The United States National Museum, under the Smithsonian Institution in Washington D.C. contains what is undoubtedly the largest mollusk collection in the world. Until Dr. Paul Bartsch, now retired was curator, it was second in size to that of the British Museum in London. Today, this collection contains over 9,000,000 specimens, 600,000 lots or suites and is in the neighbourhood of 36,000 species and subspecies. Its curator at the present time is Dr. Harald A. Rehder, and his associates are Dr. J.P.E.Morrison and the author.*

The Museum of Comparative Zoology at Harvard College, Cambridge, Massachusetts, has risen to second place in the United States within the last fifteen years. It is famous for its well-kept collection of about 7,000,000 specimens, 300,000, lots and approximately 28,000 species and subspecies. Its present curator is Dr. William J. Clench, noted for his development of students in mollusks. Dr. Ruth Turner is assistant curator.

The Academy of Natural Sciences of Philadelphia, Pennsylvania, is third or fourth in size and contains an unusual amount of valuable material. Its present curator Dr. Henry A.Pilsbry, has been with the institution for over sixty years, and he has contributed more to our science than any other worker. He was preceded by two equally famous curators, George W. Tryon and Thomas Say, America's first malacologist.

* In 1954 Mr. Abbott left the U.S.National Museum to occupy the newly-created Henry A. Pilsbry Chair of Malacology at the Academy of National Sciences in Philadelphia.

In the midwest, one of our largest fresh-water and land collections is located at the Museum of Zoology, University of Michigan, Ann Arbor. Dr. Henry van der Schalie, an expert on fresh-water clams, is the curator. The Chicago Museum of Natural History in Illinois contains a small but adequate collection and is under the care of Dr. Fritz Haas, a scientist well-versed in many phases of malacology.

There are no very large study collections in southeastern United States, although one of the finest exhibit collections is on display at Rollins College, at Winter Park, Florida. It is well worth visiting, for the collection is beautifully lighted and arranged and is instructively labeled. Of equal brilliance, the Simon de Marco collection of rarities is housed in the commercial Florida Marine Museum near Fort Myers, Florida.

The following collections of marine mollusks are found on the Pacific coast of United States :

Department of Geology, California Academy of Sciences, Golden Gate Park, San Francisco :
Large general collection, emphasis on Eastern Pacific; especially strong in Panamic fauna. Original collection destroyed by fire and earthquake in 1906. Major collections : Henry Hemphill (West American); Emmet Rixford (General) Mackenzie Gordon, Jr. (West American, especially California.) Excellent library. Curator: Dr.G.D. Hanna; Associate Curator: Dr. L.G.Hertlein; Research Associate: A.G.Smith. Exhibits. Large collections of Mesozoic and Tertiary fossils.

Department of Geology, Stanford University, Stanford Station.

Very large general collection, emphasis on Eastern Pacific. Major collections : I.S.Oldroyd (West American) Henry Hemphill coll. of dulpicates (West American); G.W.Taylor (General); E.K.Jordon (Gneeral) and Sarah Mitchell (Philippines). Excellent library Curator: Dr. Myra Keen. Exhibits. Large collection of Mesozoic and Tertiary fossils.

Museum of Paleontology, University of California, Berkeley.

Large general collection, emphasis on Eastern Pacific. Major collections : Legislative Purchase of 1884, (General) Warren Cheney (West American). Joseph Rowell (West American) D.O.Mills (General). Curator of Invertebrates Dr.J.W.Durham; Museum Paleontologist in charge of recent collection. W.K.Emerson. Excellent library. Exhibits.

Largest collections of Tertiary fossils on the coast, also Paleozoic and Mesozoic collections.

Museum of Natural History, Pacific Grove:
Small collection of California mollusks.
Curator: M.E.Hinshaw. Exhibits.

Natural History Museum, San Diego (Maintained by the San Diego Socity of Natural History:
Very large general collection, especially strong in Panamic fauna. Major collections: H.N.Lowe (West American, especially Panamic fauna, Lowe Bequest of 25,000 dollars for curation); Fred Baker (General, mostly Eastern and Western Pacific); A.M. Strong (West American, much sub-megascopic material); and J.F.Anderson (General). Curators: Mr and Mrs E.P.Chace; Research Associate: Dr. J.L.Baily,Jr. Library, Exhibits.

Allan Hancock Foundation, University of Southern California, Los Angeles: Large collection of Eastern Pacific material, especially strong in Panamic fauna; collection obtained in most part by dredging operations of the Velero111 and 1v. Bulk of collection preserved in alcohol. Curator: Dr.N.T. Mattox. Good library.

Los Angeles County Museum, Los Angeles : General collection, including some West American material in alcohol. Curator: Dr.H.R.Hill.

Department of Geology, University of California, at Los Angeles:
West American material, comprising the personal collection of the late George Willet. Curator: Takeo Susuki. Library. Mesozoic and Tertiary collections.

Cabrillo Museum, San Pedro, (maintained by Recreation Department): Exhibit of Pacific coast fauna. Curator : John Olquin.

--oOo--

At the February meeting Bill Rudman exhibited a series of specimens of the limpet Cellana craticulata taken at the Kermadecs. Shells from this isolated island are seldom seen in collections. The specimens had a rayed colour pattern and recalled to mind small examples of the Australian species tramoserica.

Cypraea tigris Linne

The following is from an article by P.Trembath, Tunby Bay, South Australia which appeared in the *Australian Newsletter* Vol. 10. No.39.

" Over the years we have had a large number of races proposed for *Cypraea tigris* Linne, namely *pardalis* Shaw 1795; *lynchchroa*, Melville 1888; *flavonitens* Melville 1880: *volai* Steadman & Cotton 1943; *amboolee* Steadman & Cotton 1943 and *rossiteri* Dantz. 1903. All these races have been proved to be of no value whatsoever as all the characters that they were based on can be found in some specimens taken from all over the area inhabited by *tigris*. Now comes Cate with *tigris schilderiana*, a large variety from Hawaii, with nothing else or little to commend it but its size, those from Hawaii admittedly being the largest in the world. (My own from there 128 m.m.) but there are also many small or medium shells there too, and specimens from Northern Australia can do and grow to a size equal to the medium and smaller type from Hawaii. Surely conchology has not reached a point where subspecific names are to be allotted to large and small and intermediate shells. *Cy.tigris* is easily recognized as that from any part of the world, and the name is sufficient to cover all shells even to the very dark forms that sometimes occur in Western Australia.

-oOo--

Mrs.A.M.Giffney of Nelson writes :-

" On October 15th my husband was given a very special parcel to give to me from one of our Nelson fisherman, trawling well out in Tasman Bay (Nelson) in about 20 faths, and this is what it was - a very old sand and weather worn clear bottle large and in it I could see just SHELLS, silt & sand and broken shells, so we carefully sm ashed the bottle open and what a wonderful sight ! Just masses of shells. All were white and silt dirty, so I picked out all the shells I could see, then very carefully washed away the silt, dried the rest out then went through it all over and over again in case I had missed even half a shell as some were so small. I have been trying to name them by Suter's book but it takes time."

These are the shells found in the bottle

12 whole and many broken *Fissidentalium zelandica* up to 47mm X 6mm.
4 " *Dentalium namum* 25mm X $1\frac{1}{2}$ mm.
2 *Aoteadrillia wanganui chordata* 12mm X 5 mm
7 Micantapex angustatus 6 mm X 2 mm.

1 *Cylichna thetidis* 5 mm X 2 mm

½ valve *Venericardia zelandica* 2 mm X 2 mm

8 *Uberella sp.* very round white shells 5 mm X 4 mm

1 *Cuspidaria trailli* splendid spec. 12 mm X 5 mm

2 white beautifully sculptured with aperture like *Epitonium* 9 mm X 3 mm

2 halves old *Nuculana bellula* 4 mm X 2 mm

2 halves and one tiny whole *Bathyarca cybaea* 3 mm X 1½ mm

½ valve only, very bright & pearly inside *Haliris setoza* 3 mm X 2 mm

7 white *Zeacolpus fulminata* to 21 mm X 3 mm.

3 *Austrofusus glans*

and a few very small frail *Nemocardium pulchellum*.

" So you see it was most exciting. It's a wonder there were any whole shells left, coming up in a trawl and being dumped on the deck of the trawler."

(Also in this material were two very rare shells :-

Globisinum drewi and *Bonelittia supertes*

Bonelittia was first recorded from the Cook Strait area by Dr. Dell in 1956 at a depth of 58 faths.) Ed.

--oOo--

CAPE MARIA DECEMBER 1962

Large numbers of the native *Planorbis* were seen in the Te Werahi Stream where it runs out over the sand into the sea. No doubt they were washed down from the large area of swamp behind the dunes.

Usually there are thousands of valves of *Gomphina maorum* washed up on Cape Maria beach. These have always on our visits, been pink and white in colour, but this time they were handsomely patterned with zig-zag brown markings.

Amongst these valves of *Gomphina* were quite a number of neat little keyhole limpets *Monodilepas diemenensis* In fact, combined collecting produced some thirty odd specimens. This is the only beach I know where they wash up.

One of the gems was a specimen of the rare Buccinulum mariae Powell, recovered froma sponge on Te Werahi Beach, just north of Cape Maria. The type specimen was from Cape Maria Island, and I don't know of occurrences from any other area. The species belongs to the group embracing colensoi, robustum & suteri.

Te Wer ahi Beach also offered numbers of the slit limpet, Emarginula striatula. Some were of exceptional size (one example reached one inch) in length and $\frac{3}{4}$ inch in width.

A number of specimens of the southern limpet Cellana denticulata were taken from outer rock ledges at Cape Maria Headland. One or two were of fair size though not as large as the old bleached specimens which occur high up in the nearby dunes.

Some examples of the ribbed Notoacmea pileopsis cellanoides were also secured from high tidal rock faces of the Cape itself.

--oOo--

The NEW ZEALAND CASSIDS

Part 2.

X.pyrum Lamarck
Fig.7.

A globose shell with a single row of nodules on the shoulder of the body whorl and pale dun in colour with spirally arranged patches of purplish brown. The operculum resembles an open fan. Large specimens wash up sometimes on the coast from Waikanae to Otaki and in the Bay of Plenty. Their appearance is sporadic and often a good locality may prove disappointing. Other localities are Houhora, Doubtless Bay, Ninety Mile Beach, Whangarei Heads, Laings Beach, Leigh, Great Barrier, Mokau, Muriwai, Farewell Spit off Granity.

--oOo--

X.powelli Finlay
Fig.8.

Of true pyrum type. It has stong spiral grooves and no nodules, often of plain pinkish fawn colour with weak or absent pattern. Seems to inhabit deeper water although an odd specimen does wash up.

Localities :- Bay of Plenty, Manawatu Coast, Off East Coast Great Barrier Is. 40ths.Cuvier Is.

ERRATA:- X. labiatum - Fig. 10) Please alter your
X. collactea - Fig. 2) copy accordingly.

--oOo--

X. hamiltoni Powell
Fig. 9.

A solid globose shell with a low spire. Spine and base striated and with several deep grooves below suture. No nodules. Colour pink or light brown with no trace of colour pattern.

Locality :- Off Cape Campbell in 60 fths.

--oOo--

X. collactea Finlay
Fig. 2.

Occurs more frequently than labiatum, often has labiatum colour, that is a mottled cream colour, chestnut brown and purplish shade. Has smooth spire and nodules on last half whorl.

Localities :- Ninety Mile Beach, Laings Beach, Leigh and Bay of Plenty.

--oOo--

X abernethyi Dell
Fig. 11.

"This species combines in part the shape of hamiltoni Powell with the denticulate aperture of harrisonae. From hamiltoni it differs markedly in the labial denticulation and the much heavier labial varix.

From harrisonae it may be distinguished by the heavier lip, stronger denticulation, the lack of nodules and the much stronger incised spiral sculpture.

Localities :- Beach shells Castlepoint, Trawled off Castlepoint 40 fths. off Palliser Bay, 100 fths.

--oOo--

Galeodea triganceae Powell
Fig. 12.

Shell of moderate size rather globose. Aperture produced into a fairly long twisted anterior canal. Spiral lines on body whorl crossed by apials rendering them nodulous. Size 42 X 27 mm.

Localities :- 60-70 fths off Timaru,
Chatham rise 220 fths.

N.Z.CASSIDS. Part 2.

Fig.10

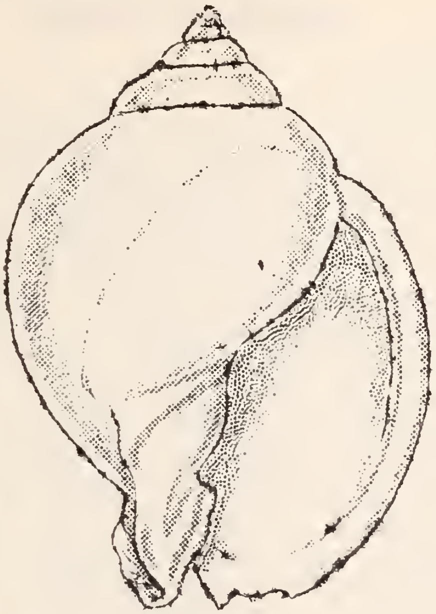


Fig.8

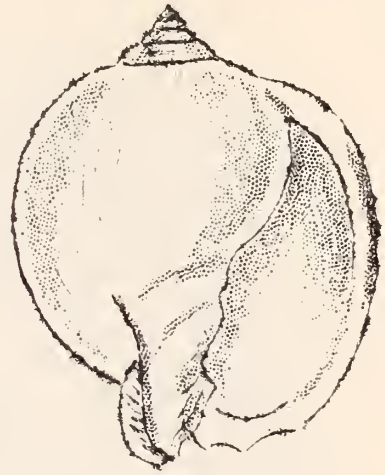


Fig.9

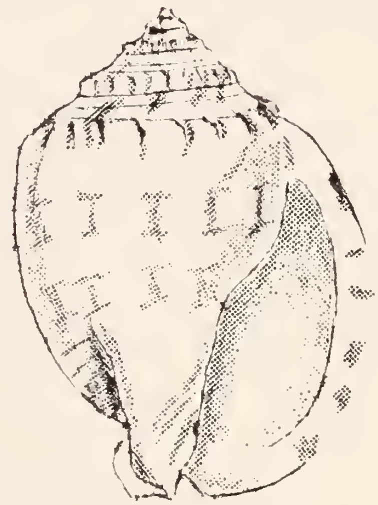


Fig.7

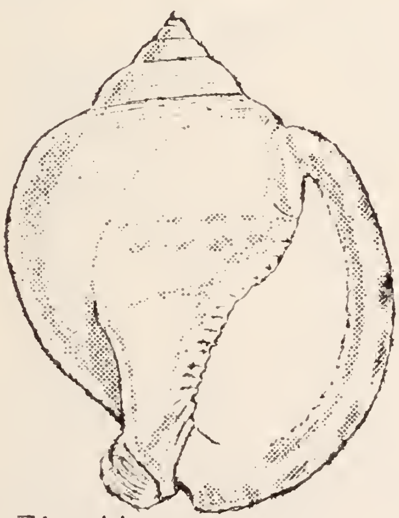


Fig.11.

Fig.12.

A.K.Hipkins.

A Trip to Kaihoka

B. Elliot.

On November 13th, Mum, Dad and I spent the day at Kaihoka, on the Nelson West Coast, collecting shells. We stopped at Kaihoka Lakes to search the bush for Paryphanta gilliesi subfusca. Dad found a number of old freshwater Mussels at the side of the lake, so I decided to see if I could obtain some better ones by diving for them. There were hundreds of them, alive, in six feet of water and deeper, so I brought ashore several dozen, picked out the best ones, and returned the rest to the lake. Unfortunately the shells were rather eroded, but the juveniles were in good condition. Meanwhile Mum and Dad had found about a dozen Paryphantas, none of them alive, but mostly in good condition. We were later told that we had been looking in the wrong place for live ones, so we will go back another day and look in a different place. Mum found two little Maoriconcha oconnori, but she didn't realise what they were, and didn't show them to me at the time, and they both crawled away. However, we found one of them again two days later. An interesting point about this little snail is that when disturbed, it writhes and jerks frantically, as a fish will when taken from the water. Also, it dies within a day, unlike other snails, which remain alive for some time.

We were able to drive most of the way to Kaihoka Beach, but had to walk the last half-mile, with a scramble down a steep, lupin covered hill, where there seemed to be no track, before arriving at the beach. The sandy beach was quite bare at high tide, and although things did not look very promising at first, there was an abundance of live specimens to be collected round the rocks at low tide. Cryptoconchus porosus were very common, and I collected over 50 specimens, including some of the largest specimens I have ever seen. The middle valves of the largest one are ¾ inch across. If I'd realised how long it was going to take me to clean all those valves and mount them on cotton wool, I wouldn't have collected so many Cryptoconchus, but although it took me days and days, it was worth it, as they are lovely for exchanging. There were other kinds of Chitons too, but I don't know enough about chitons to be sure which kinds they are. I think the large ones are Guildingia obtecta, and the small ones Acanthochiton zelandicus. I put a dozen or more sea slugs in my bucket, in the hope that some of them would contain shells. The only slug I saw that I knew was a Glossodoris aureomarginata, which I left behind as I knew it had no shell. I collected a number of Onchidella, the largest ones I had seen. I think there were two kinds but cannot be sure.

There were plenty of Haliotis iris; nice big ones, and we gathered quite a lot as we wanted them for eating as well as for their shells. I found about a dozen live Scutus breviculus. Most of them were in small crevices, and difficult to get. Their shells range from $1\frac{1}{3}$" to $2\frac{3}{4}$". Maurea punctulata were very common, both alive and crab-inhabited. Maurea tigris is supposed to be found at Kaihoka, but although I didn't find any myself, I was lucky enough to be given a large live one by a local resident. I found a dozen Axymene clustered together on a rock. They are the largest and the cleanest ones I've seen. I only found one group of them. Likewise, I found just one group of Patelloida corticata. Collected a number of commoner shells for exchanging - Lunella smaragda, Neothais scalaris, Melagraphia aethiops, Cellana radians and Cellana radians perana.

We arrived home late that night, tired out, but well satisfied with our day at Kaihoka.

But my biggest thrill came two days later. I boiled up the sea slugs, and had examined all but one of them without finding a single shell. I had given up hope by that time, but was thrilled to find that the very last one contained a shell. I was even more thrilled when I realised what it was - a Lamellaria cerebroides. Unfortunately I have no idea what the live animal looked like, and though I read Suter's description I cannot recall finding a slug like that. The shell is $\frac{5}{8}$" by $\frac{1}{2}$" in size and is a perfect specimen.

--oOo--

Now that all the N.Z. Cassids have been figured we hope to start in Part 4 of Poirieria, a series of illustrations of the N.Z. Volutes - Alcithoe, Leporemax, Pachymelon and Iredalina.

--oOo--

The collection of the late member Mr. Jeakings (Christchurch) has recently been presented to the Auckland Museum. Dr. Powell mentioned that the collection was packed in 20 cases. He jokingly considered that the only way the large numbers of the scallop shell Pecten novaezelandiae - at least several hundred - could be accounted for, would be if the collector had a gastronomical interest in this species as well.

Dr. Powell mentioned that there was some very good material present which has been added to the reference collections.

--oOo--

New Publications.

We have before us a further Number in the Records of the Dominion Museum; containing an abticle by Margaret Crozier entitled " New Zealand occurances of the Sydney Mud Cockle, *Anadara trapezia* (Deshayes)

"The repeated occurences of *Anadara trapezia* (Des) in the late Pleistocene deposits of Northern N.Z. and the discovery of a well preserved valve in the Castlecliffian bed at Te Piki, Cape Runaway, in March 1962 by R.K.Dell has stimulated interest in the occurences and geological range of this species in N.Z. This paper is an attempt to compile the information at present available"

From the locality records inthis paper it seems that the range of the shellfish extended as far south as Gisborne on the East Coast and Castlecliff on the West,.

--oOo--

Mrs.Ward Brown of 1420 N.Lakeside, Lake Worth, Florida writes that she would like to exchange shells with a New Zealander. She is the founder and first President of the Palm Beach County Shell Club, and has collected for nearly twenty years in Florida, West Indies, Bahamas and the Mediterranean. Most of her shells have been taken alive with operculum, but others if not taken alive are nevertheless perfect. Most have carefully noted data. Mrs Brown would also like a Golden Volute and suggested that we might have the name of a dealer who could oblige her.

--oOo--

From Mr.I.J.Hannah of 7 Hillcroft Rd, Tauranga, comes a note that he has a collection of 35 Nautilus shells in a glass case. They are very evenly graded the biggest being about 6" and the smallest $\frac{3}{8}$". They are not chipped or marked in any way. They were collected at Mayor Island many years ago.

Anyone intreested in obtaining these shells should write direct to Mr. Hannah.

--oOo--

THE CLASSIFICATION OF THE UNGULINIDAE

By C.A.Fleming, New Zealand Geological Survey.

Andre Chavan, well known for his work on Lucinidae and other Mollusca, has recently published a critical essay on the classification of the Ungulinidae in the Bulletin of the Institute royal des Sciences naturelles de Belgique (vol.38, no.23, July 1962). He recognises 11 genera, 3 of them divided into 2 subgenera. He repeats his belief that Taras Risso must be disregarded as nomen dubium because the type species cannot be determined, the types having been lost.

Chavan's classification is of interest in separating the two New Zealand groups and relating them to overseas species.

Not all New Zealand species are mentioned but the following classification is proposed :

Genus Diplodonta Brown 1831

Subgenus Zemysina Finlay 1927

Diplodonta (Zemysina) globus Finlay

Diplodonta (Zemysina) striatula Finlay

The subgenus Zemysina is also used for Eocene and Miocene species from Europe and for Miocene to recent species from America.

Genus Felaniella Dall 1899

Subgenus Zemysia Finlay 1927

Felaniella (Zemysia) zelandica (Gray)

In addition to the New Zealand form(s), Chavan includes in Zemysia certain American Miocene and European Pliocene species, and suggests that another branch ranges from the Lower Eocene of Paris and perhaps persists in California today.

The earliest members of the family are Upper Cretaceous and several groups have been conservative since the early Tertiary. In New Zealand, for instant, Zemysina appears in the Paleocene and Zemysia in the Upper Eocene.

--oOo--

SHELL NAMES AND THEIR MEANINGS.

Notes from a talk by Mr. A.W.B.Powell, July 1950.

Generic names are usually based on either Latin or Greek words, e.g. Turritella from the Latin (turris- a little tower

Xenophora from the Greek (Xenos-strange
(phoreus-a carrier.

both these shells being very suitably named.

Shells peculiar to certain localities are often named by adding " ensis" which means of " that place"- e.g.
manakauensis
wellingtonensis
chathamensis

Other endings sometimes used are - us, a, i, ae, orum. We find "i" added to a man's name when the writer wishes to honour that man, e.g. huttoni, finlayi, swainsoni; and "ae" to a woman's name, thus wilsonae, mouatae; also when wishing to honour two persons at the one time we find "orum" is used as in the case of prouseorum. Other endings often used are "opsis" and "oides", both of these being used as comparatives, e.g. Risellopsis, like Risella; jaculoides, like a javelin.

Prefixes are used occasionally in the naming of shells :
e.g. "Para"- equal to - Paratrophon
"Par" - like - Pareuthria
"Noto")
"Neo") - new -(Notosetia
(Notoacmaea
(Neoguraleus.

Ex is often used for emphasis as in the name exsculpta, meaning, of course, deeply or heavily sculptured. Then we have names which refer to the colour of the shells, e.g.

rufous - red	viridis	-	green
luteus - yellow	albus	-	white
brunneus- brown	atratus	-	black
caeruleus - blue	argenteus	-	silver
	aureus	-	gold.

as well as others referring to the sculpture, e.g. costata, striata, lirata, crenulata, tenuis. crassus, laevis, or levis; WHILE OTHERS refer to the size, e.g. maxima, minutus, minutissimus. Yet another descriptive name is pulchra - beautiful, and its superlative, pulcherrimus.

Several shells are based on the straight out use of Latin terms, e.g.

Pecten.	meaning	a comb.
Ostrea	"	an oyster
Scrobs	"	a trench
Patella	"	a knee cap.
Tonna	"	a large cask.

Other names have been given to shells to honour certain well known conchologists ,

e.g. Verconella - Sir J. Vercoe, well known for his work on South Australian shells.

Mayena - Mr. W.L.May, well known for his work on Tasmanian shells.

Murdochia - R.Murdoch, a former well known authority on N.Z. Land Mollusca.

Then we find that we have anagrams amongst our shell names, e.g. Merelina - Linemera;- Lironoba - Nobolira.

What may be termed as nonsense names occur occasionally e.g. "Pharlapiscus" is the name given to a sea-horse from Australian waters. What could be expected, perhaps, for a huge animal is this name, but in reality it is the name of a small fish in America - Parvastomatiaichthyborus.

--oOo--

Forma albino.

Some nice albino specimens of Laoma mariae Hutton, were collected at Mokau Point, Lake Waikaremoana, during the Easter Holidays.

The apertural lamellae seem to show up much more clearly in these than in the normal coloured examples.

--oOo--

Rhytida dunniae, Gray

Occurs not uncommonly at Hunua Gorge- which is the most southerly recent record I know of in the Auckland area. This is also a good place for Liarea egea.

--oOo--

Several more examples of Tonna dolium - very rare in N.Z.waters - have been secured, during the last twelve months. All were, as far as I know, from fishing trawlers.

--oOo--

Seen recently in the collection of Mr.E.Willis - a large, though damaged specimen of the rare Xenophalium royanum. This specimen was picked up on Waikuku Beach, near North Cape and must surely be the first known instance of a wash-up.

Previous records were from crayfish pots in the Whangaroa area.

--oOo--

<u>Laoma ciliata</u> :-

Laurie Price has this new record for Kaitaia. It is rather uncommon up there and the specimens are smaller than the average. This tiny land snail of bee hive shape and with hairy processes, occurs in the Gisborne-East Cape area. Suter records it also from Wanganui and Hawkes Bay.

--oOo--

Several nice speimens of the Paua slug - <u>Schizoglossa</u> novaezelandiae, were shown at a recent meeting. These were collected from under rotten wood in National Park area. It has a small shell compared with the more northern <u>worthyi</u>. Mr. Penneket mentioned that he came across <u>Schizoglossa</u> some time ago on Cuvier Is. No live slugs were seen but a number of dead shells were encountered, apparently damaged by rats. However, four good examples were sorted out, 2 he still has, and 2 he gave to Dr. Powell, who considered they were the same as the Great Barrier species, i.e.<u>S.barrierensis.</u>"

Mrs.Mitchener writes :- It was interesting to hear in January of more specimens of <u>Hydatina physis</u> coming to hand from time to time. Facts indicate the existence of a colony at Port Fitzroy mudflats, although I am aware that this is not considered feasible. However the fact does remain that 12 live specimens of varying sizes were washed up in this area last August. This can be vouched for by Mr. David Cooper from the guest-house, who actually found them. A friend of mine, a non-collector found three specimens in November and December, one she claims was 3" in length.

--oOo--

Some very fine large specimens of <u>Notoacmea scopulina</u> Oliver, have been collected by Mr. Price at South Head, Herekino Harbour. One large specimen measured 22 m.m. Specimens have a low apex and the inside is bluish-white with dark blotches and a spotted margin.

--oOo--

Land snail collectors are a race apart - absolute fanatics! I have heard tell ! No doubt some of their field trips are strenuous, some involve risks too !!

A certain Northland member has had a 'bug' about getting onto Cape Maria Island. So what does he do - inflate his lilo, don a life jacket, and on a nice calm day floats across from the mainland to the island about a quarter of a mile away. Here he spent a couple of hours amongst the Placostylus snails beofre returning the same way! Ever heard of the rip through this gap ?? (As for the Placostylus snails - subrecent P.hinemoa is there in countless thousands, while P.ambagiosus

ambagiosus appeared to be very scarce indeed on the southern face.

--oOo--

MANGONUI HARBOUR - DOUBTLESS BAY AREA.

With the low tides of April near, Mr and Mrs Mathews Mr Hodge and myself set off early in the morning from Coopers Beach for Tokerau and Whatawhiwhi. Making good time we were soon at the Planks, the first road of entry to Tokerau, for a quick look at the high tide mark. Here were the following wash-ups :

Bassina yatei invery good order
Spisula aequilateralis
Amphidesma subtriangulatum
Mactra discors
Cyclomactra ovata
Amphidesma australe australe
Alcithoe depressa, in good order but not plentiful.
Offadesma angasi, 1 badly holed, 2 in good order.

Half valves of the following were plentiful, showing this area would probably reward a shell hunter doing a little dredging outside the breaker line.

Longimactra elongata
Resania lanceolata
Zenatia acinaces
Panopea zelandica. Also present were very good specimens of Struthiolaria papulosa.

Moving on to the P.O. road part of the beach, we found Panope zelandica in thousands, very hoary specimens, extremely heavy, and wonder of wonders, some with valves still joined. Many juveniles and adults of both Struthiolaria papulosa & S. vermis were stranded, still with the animal inside, and still very smelly. Here also were Venericardia purpurata, Tawera spissa, Alcithoe arabica, a few A.depressa and one of them a perfect typical specimen. Hundreds of Zethalia zelandica made the high tide mark line a feast of beautiful colour. Lower down on the low tide mark we were later to collect a few fine live specimens of Zethalia.

The tide is moving out so on to the real hunting ground at Whatawhiwhi. Following the tide down the hermit crabs provided us with Cirsotrema zelebori, and in the rock pools were hundreds of large Cookia sulcata of which we collected enough for our exchanges for a couple of years, and even then made no impression on the numbers present. Haliotis iris was there but mainly small specimens although some were large enough to provide us with fine shells, with prospects of a good meal at a later time. Large well marked specimens of Maoricolpus roseus spire down in the seaweed, all alive, were added to the bag.

Cominella virgata brookesi, fairly plentiful in good clean condition and well marked, and near them C.virgata some of which showed one side pure virgata, the other as in C. v. brookesi. Large specimens of Trichosirius inornatus were found in the seaweed below low tide mark, and also one or two specimens of Agnewia tritoniformis. On the seaweed in the deeper pools were Cantharidus purpuratus. Just above the low water mark I was lifting some rocks when I spied a large Charonia capax trying to hide from me. This large specimen was carried home carefully in a bucket of salt water and the following morning I tried to photograph it in colour. The animal was well spread out, but unfortunately my camera is not meant for close-ups so both slides are a little out of focus, but nevertheless the colour of the animal shows up quite well and the lovely blue edge of the mantle fastened to the outer lip is better in the photograph than in reality.

Tethys were very common here and exceedingly large. Also seen were Notoplax violacea on the underside of rocks, with many chitons in evidence including Amaurachiton glauca, and Ischnochiton maorianus. Large specimens of the black slug Scutus breviculus were plentiful in the deeper dark pools. Leaving this lovely spot with a promise that we would visit it again later in the year we repaired back to Coopers Beach for the night.

In the morning after chores had been done, we set off for Taimaro on the other side of the Mangonui Harbour, and after lunch started on the rocks just below the high tide mark.

Here Tugali elegans were in numbers, with smaller quantities of T.bascauda.

Buccinulum were plentiful, large beautifully marked B.lineum, less of B. multilineum, B.vittatum exceedingly white with strong black stripes, and many of mixed B. heteromorphum parentage. We also collected the less common B. suteri which can be identified by the gemmules; and some more of the little red Buccinulum sp, these being fairly common in this area. Prior to this we have collected this type of specimen from Matapouri, Otara Bay, Whananaki, Whangaruru and the Bay of Islands. The colour does not appear to be in only one locality or on one particular area of rock. It is a small shell, rather like the B. heteromorphum form.

Marginella mustelina and Daphnella cancellata were plentiful, the latter being large clean specimens, strongly marked. Mathews here collected a fine young Charonia capax, and a lovely bright yellow Pteronotus eos, the largest I have ever seen, being 28 m.m. in length. Later on she collected three more specimens but not nearly so large. Mayena australis were here, fine clean specimens, Thank goodness, the protoconch was still intact.

Penion mandarinoides and P. adusta were also present under the rocks near the low tide mark.

Amongst the shells collected at Tokerau were some small bi-valves which looked like a juvenile shell, but on closer investigation, it was found to be full sized adult Maorimactra ordinaria. These were the first I had collected and were also the first in my collection.

The farmer whose area we were visiting at Taimaro stated that it had been some years since collectors had been here and farther along the Bay, so now we hope to visit it again in the near future and work round to a far cape whose rocks looked particularly tempting.

L. Seager.

--oOo--

"BEACHCOMBING IN THE HOROWHENUA AREA of the WELLINGTON DISTRICT.

During the summer holiday period, the beaches at such popular resorts as Paraparaumu, Waikanae, Otaki and Levin are crowded, but that is roughly the area in which we spent a very enjoyable and rewarding "Shelling" holiday from December 22nd to January 8th.

However, it must be pointed out that the most rewarding areas were those well away from the crowded beaches, and the whole area with the exception of north and south of a very stony Otaki river mouth were well worthy of visits.

As, in the past, not only were high tidal areas combed, but also the vast areas of drifting sands, (which shifted after every strong wind storm) and these too, were found rewarding in good shells of nice colour, clean and bright, and mostly in perfect condition.

Some of the shells found alive in this entirely sandy region were rather surprising, and in the following lists, where shells were taken alive the fact is stated.

One day a visit was paid to the rocks at Pukerua Bay, and here limpets in abundance were taken as well as H Haliotis varieties. Mrs Voyce also found a large cuttle-fish bone, which was something new for us to find it on N.Z. beaches, and later on, showing it to a prominent trawler fisherman, he said that it must have come from a very large squid, for though broken, it measured ten inches long.

A visit was also paid to Paekakariki and north, but these areas were not rewarding except for a few Maurea cunninghami.

We spent a part of every day on the beaches, even the day when the Wellington area experienced six inches of rain, and when the dressing sheds of the swimming baths were blown into the Harbour!

Alcithoe swainsoni Alive Both plain and ribbed.
Alcithoe swainsoni motutarensis " " " " alive.
Alcithoe fusus fusus
Alcithoe arabica

Astrea heliotropium
Haliotis iris alive
Haliotis australis
Maurea cunninghami Alive.
Maurea punctulata
Xenophalium pyrum Alive

Janthina violacea
Cellana radians
Gari lineolata
Baryspira australis Alive
Zethalia zelandica Alive
Penion adusta
Penion mandarina
Cominella adspersa Alive
Argobuccinum tumidum
Cabestana spengleri
Tanea zelandica Alive
Poirieria zelandica
Lepsia haustrum
Lepsithais lacunosus
Atrina zelandica
Bassina yatei
Dosinia anus
Solemya parkinsoni
Cookia sulcata
Spirula spirula

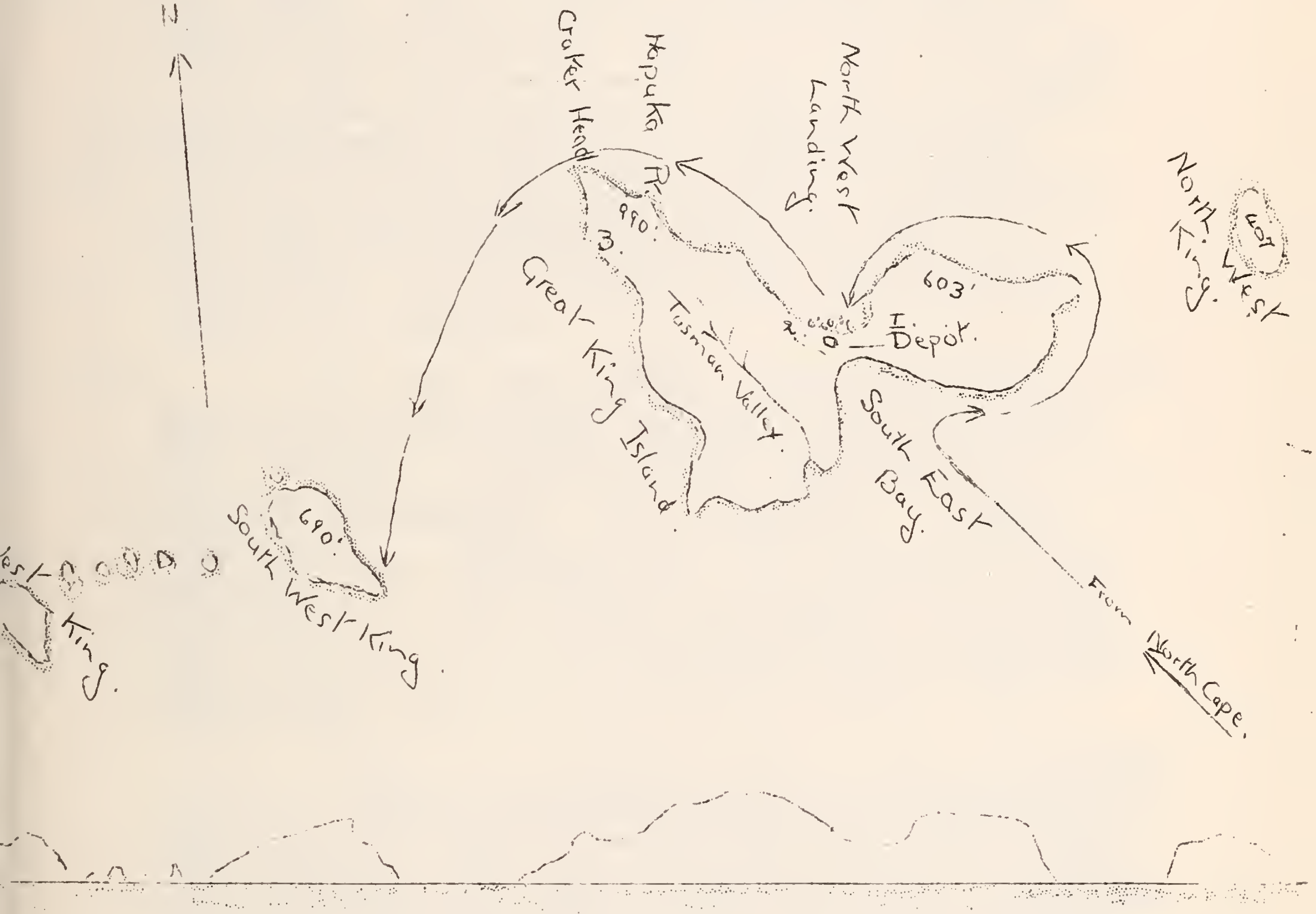
Pecten novaezelandiae
Maoricolpus roseus
Struthiolaria papulosa alive
Struthiolaria vermis alive.
Amphidesma subtriangulatum
Mytilus canaliculus
Austrofusus glans alive
Zeacolpus vittatus
Maurea pellucida.
Aeneator o.cookianus

A.H.Voyce.

--oOo--

A collecting tip garnered from the American publication of the Malacological Union may prove of help to members. " A common small plastic washtub is a good thing to take along when collecting in water not exceeding 4 feet. Simply tie it to your waist with a very stout cord and in it place your shell jars, lunch tools etc. Then tow it about whereever you go" Now on top of your other collecting gear add this washtub to the heap in the car !!!!

THREE KINGS



I. Placostylus bollonsi bollonsi (Suter)

2. " " bollonsi caperatus. Powell.

3. " " bollonsi arbutus. Powell.

THREE KINGS ISLANDS ... A QUICK LOOK.

L.Price.

The Three Kings Islands, agroup comprising four main islands, plus a number of islets and rocks, are situated some 29 miles to the N.W. of Cape Reinga, in far northern New Zealand. Much of the flora and fauna of this group is quite distinct from that of the Mainland, and for this reason is of considerable interest to naturalists. For nearly 60 years goats roamed Great Island, and, until their complete destruction in 1946, caused terrible havoc amongst the vegetation. Now, fortunately, regeneration is going ahead by leaps and bounds, and with the whole group free of pests of any kind, it is to be hoped these conditions will continue for all time.

For some years, Norman Gardner and I have toyed with the idea of somehow getting ashore on the Three Kings, but until recently had done nothing much about it. However, a few days before Christmas, 1962, it suddenly struck me that a talk with local fishermen may turn up something... and so it proved. Several months before, a party of six amateur naturalists had approached this same fisherman, and things were almost finalised for a trip to the Islands within a few days. Panic stations ! I hurriedly rang Norman in Auckland, and he informed me he was practically on his way to the Three Kings, and to see if he could obtain a landing Permit, pronto.

Well .... it happened that luck was with us all the way, and with everything jacked up, including the weather, we were heading north aboard the "Ahiki" on the 30th December. Travelling steadily through the night, we were cruising off Great Island by 9 a.m. next morning, Conditions were near perfect. We were soon all ashore, together with mountains of gear, at the N.W. landing rocks. At last our dreams had become reality within the space of one hectic week!

The first thing noticed on going ashore were the boulders literally plastered with the well-known Wellington limpet, CELLANA DENTICULATA (Martyn)...an amazing sight to see these shells so far from home and in such numbers. The second most noteworthy thing was the apparent complete absence of the widespread and common CELLANA ORNATA (Dillwyn) .... not a single specimen could be found. Apart from the limpets, marine collecting around the shores is rather difficult, as, except for a couple of small areas of king-sized boulders, the shoreline consists of rugged cliffs dropping sheer into deep water.

However, we managed to come up with the following species, though our stay was ~~limited to only~~ 3 days on Great Island......

Cellana denticulata (Martyn)..........	(common, large)
Cellana radians radians (Gmelin)	(common small, dark.
Notoacmea pileopsis pileopsis (Q&G)	(common, large)
" " " " cellanoides (Oliver)	(common, small)
Patelloida corticata corallina (Oliver)	(common, very large)
Patelloida corticata pseudocorticata (Ire)	(common)
Siphonaria zelandica (Q&G)	(uncommon Large)
Gadinlea nivea (Hutton)	(common)
Haliotis iris (Martyn)	(Common, large)
Neothais scalaris (Menke)	(common)
Neothais smithi (Brazier)	(not uncommon)
Zeatrophon ambiguus (Philippi)	(common)
Nerita melanotragus (Smith)	(Common, very large)
Anisodiloma lugubris	(Common)

Our first task ashore was to scale the 300 foot cliffs to find a suitable campsite. The advance party staggered around for over half an hour before reaching the top, although, within a couple of days we could race up in 10 minutes and down in five! Luckily, good water was found in Castaway Stream only a few yards above the wreckage of the old depot, and here we thankfully collapsed. Recovery was rapid however, as Norman and I soon began sorting out many choice specimens of the lovely Allodiscus cassandra (Hutton) This shell proved to be abundant over the whole island.

New Year Day, 1963, we were away early, after deciding, to visit the colony of Placostylus bollonsi arbutus (Powell) on the western side of the island... On the way, about half way up Castaway Valley and under a thick grove of trees, we collected a fine series of Egestula gaza (Suter) plus a few each of Allodiscus turbotti (Powell) Therasiella pectinifera (Powell) and Delos cf. jeffreysiana (pfr). Just south of the Crater Head, we soon found the P.b. arbutus colony, and were thrilled to examine the first living specimens we had seen... undoubtedly, they are magnificient shells. During several hours, we saw at least 200 living specimens, including approx.46% juveniles.

Quite a gratifying increase on the 25 living specimens located in 1945!

On our way back to camp, we stopped beside the stream in the upper Tasman Valley. While lunch was on, Norman fished out some specimens of a Potamopyrgus these appear identical with the mainland Potamopyrgus .ntipodum zelandiae (Gray)) ..... they were also seen later in Castaway Stream.

After a short breather in camp, we headed across the saddle to the slopes above the S.E.Bay, and here, after a considerable search, located the colony of Placostylus bollonsi bollonsi (Suter). A count showed at least 40 living specimens, including again 40% juveniles .... also a healthy increase on the 11 living specimens seen in 1945. In leafmold at this site, a few specimens of Cytora (Murdochia) solitaria (Powell) and Mocella manawatawhia (Powell) were found.

Next morning, 2nd January, we decided to return to the site of the P.b.arbutus (Powell) colony to search for small snails, and in particular, the large hairy Cytora (Murdochia) hirsutissima (Powell), but apart from more Egestula gaza (Suter) we were out of luck. A small bag of leafmold each we gathered here, and although not yielding a sinle Cytora, Norman has turned up a couple of specimens of a new species of Thalassohelix ... the first of this genus on record for the Three Kings area. Also of interest here, while collecting the leafmold, I found two specimens of albino P.b.arbutus (Powell)... the first albino Placostylus I have observed.

During the afternoon, we had a look at the Placostylus bollonsi caperatus (Powell) colony, which is situated in a shallow valley above the N.W. landing, just below the crest of the saddle. Like the other colonies, these are also thriving, a count of at least 40 living specimens including 20% juveniles was made, compared with 40 living specimens seen in 1946. An unusual feature here being the number of dead shells about, most being very old and bleached.... whereas in the other two colonies, deads were quite a rarity. At the foot of this N.W. landing slope just above where the vegetation commences, a large number of Cytora (Murdochia) annectens (Powell) were found amongst stones undet stunted Ngaio bushes.

The following morning, January 3rd, the weather was beginning to change. Much to our regret, we were obliged to pack up and descend to the landing, and before midday all were aboard the boat once more. Our stay had been nost pleasant and interesting, the weather perfect, the only fly in the ointment, so to speak, were the hordes of blowflies that plagued us from the crack of dawn to black night. Mosquitoes were hungry at sea-level, but on top there was not a one.

CYMATIIDAE

Some Manakau Harbour Observations

by
S.R. & A.M.Ayling.

....

This paper contains observations on some members of the Cymatiidae family found in the Manakau Harbour. It is a joint paper by the authors and was originally given as a talk at the Conchology Section of the Auckland Institute and Museum on April 16th, 1963.

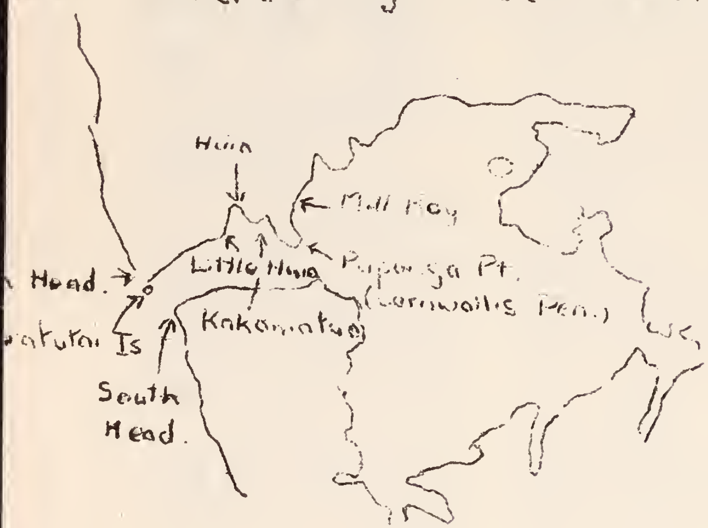
The approach of the January 1963 new moon was the obvious time to plan trips to the northern shore of the Manakau harbour, but as usual the useful low tides occurred at most awkward times. All observers of marine life know the effort required to ultilize these fruitful low tide periods. On the Sunday the -0.4 and -0.3 low tide occurred at 5.21 am. and 5.49 p.m. respectively and one had the choice of rising before dawn or upsetting the family dinner arrangements. Monday was a little better and on Tuesday the times were much more respectable but by then the lowest 6-12 inches was covered with water and hopes faded for another month or possibly six months until the next minus tides.

The main purpose of the trip was to continue observations of the members of the Cymatiidae normally to be found on the North Shore of the harbour. During the past 3 years several such trips had been made, observing and counting, always, of course, with eyes open for the exceptional specimen.

Those not acquainted with the Manakau Harbour may appreciate a brief description of the area covered by the observations. It stretches approximately from Mill Bay at the eastern base of the Cornwallis Peninsula around the shore to the north heads, a distance of some 12 miles. It is an area with a most diverse geography. Admiralty Chart No. 2726 supplimented by the late Mr.S.Hulme's paper in our Bulletin No.1 , July 1961, gives some idea of the vast possibilities of the area. Exploration of the ground soons confirms this and revelas both the difficulties and the prospects of the area. Offshore lie the banks, including part of the vast Te Tau Bank and all of the smaller Huia bank. Converging off Puponga Point at the end of the Cornwallis Peninsula are the four main channels of the Manakau Harbour, which here join and flow to and from the sea in one great stream.

Larva in Veliger Stage.

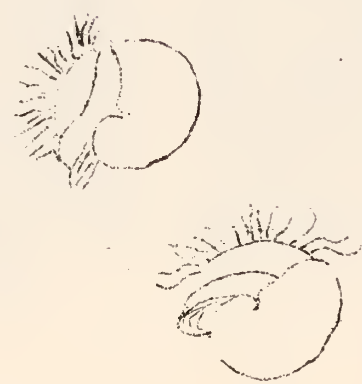
Area Covered by Observations.



Manukau Harbour.

Larvae 24 hrs. After being Laid on 28-1-63.

Larvae after $1\frac{1}{2}$ days in Seawater



Larvae after $6\frac{1}{2}$ days in Seawater.

The collector in the Huia-Kakamatua area and also in the Mill Bay-Cornwallis area will find vast expanses of mud flats, often difficult to transverse, covered mostly by ZOSTERA or "seagrass". These flats are often broken, especially near the low tide mark by rocky reefs standing above the mud. The slightly sloping surface of the reefs is invariably covered with Corallina offucinatus (a small algae) and Hormosira banksia or "Venus's necklace".

Around the Cornwallis Peninsula and also from Little Huia to Paratutu Island near the Heads, the coast line is, in the main, steep cliffs at the base of which is merely a rocky narrow ledge exposed only at low tide. The edge of the ledge slopes rapidly into 5 or 10 fathoms of swiftly flowing water, through which can be seen seaweeds growing on the steep slope.

Collecting in this entire northern area is often reqarding but is always strenuous and sometimes dangerous.

Having described briefly the area covered by this paper it may be useful to recall the members of the Cymatiidae family which one can reasonably hope to find on the Manakau Harbour and to give some idea of their localities and habitat. Dr. Powell's Checklist on page 93 in the 1961 edition or page 101 in the 1957 edition of "Shells of N.Z." lists the complete family which contains some of our largest and most beautiful shells.

The most common member found in the area is Cabestana spengleri(Perry, 1811). Good specimens of these are obtainable at or very slightly above the extreme low tide mark. The majority seen to be uncovered only for a short period and are usually found associated with the reef outcrops. They are either tucked under the overhangs or wedged into the funnels running up the face of the reef or sometimes on the underside of the few large rocks scattered about the area. The cleanest specimens are on the reef, while the larger but more eroded shells are found at the base of the boulders and never seem to be uncovered completely.

Another species of this genus is Cabestana waterhousei segregata Powell, 1933 , of which the authors have found only one example in this area. Although at first sight this species looks much like a small Cabestana spengleri, it is quickly obvious on closer inspection that there are several differences. The single row of nodules so characteristic of C.spengleri are, in the C.waterhousei segregata, divided or 'segregated' into two less pronounced rows and as a further confirmation it will be noted that the epidermis is continued around to form a flat hairy covering over the outer lip. The authors' specimen was found on top of the reef but one find is obviously no indication of their usual habitats.

Cabestana bolteniana (A.Adams,1854) has been found in the Huia area but like C.waterhousei segregata seems to be very rare.

Passing to another genus, Monoplex, the species australasiae, Perry, 1811, is fairly plentiful, but is normally harder to see. It seems to be found near the reefs or boulders but usually more concealed by mud than the Cabestanas. This shell with its beautiful animal and hairy epidermis is surely a delight to all collectors.

The next most commonly found member of the family is probably Mayena australasia(Perry,1811). It is found a little higher up the beach and under, or at the base of rock boulders, often in muddy conditions.

Two other members namely Charonia capax,Finlay, 1927, and Charonia rubicunda(Perry,1811) are found in this area. These two species, especially the former are found only rarely. Mr.A.H.Jones, of the Section listed all known finds up to the date of his papers in Bulletins Nos. 14 and 14. Since then it is known that four others have been found. The table below shows the original list with some additions. It will be seen that 15 definite and one doubtful specimen of C.rubicunda and 3 definite C.capax have been found.

Are they really as rare as the few finds would indicate or is it only the odd specimens that stay too far up the shore are found ? Do they live in deep water or in the shallow reef or bank area ? We have a few pointers. The late Mr. Hulme of the Geological Survey, Lower Hutt, in Bulletin No.16 reports on a rapid one day survey he made of the Manakau Harbour. In his opinion little life can exist in the swift deep water area. If this is correct, then the area of search is considerably reduced. Skin divers have found these shells in 30-60' of water at Paratutai Is. and in the Hauraki Gulf on the Waitemata side at 12-18'. The younger author of this paper has dived at Puponga Point in the more sheltered areas using aqualung equipment and found the bottom rocky and suitable, but visibility is mostly bad, 2' or so, and extended search difficult. More work is obviously required.

Other members of the family may have been found in this area and if so the authors will appreciate any details that can be supplied.

To return to the January low tides expeditions mentioned at the beginning of this paper and to the authors main interest at the present time. Most shell collectors have probably wondered at times just how many animals of a species there are in a particular area, and whether collecting might be adding to the struggle of molluscs for existence. The rest of this paper gives some of the suthors' findings while attempting to investigate this problem as it relates to the Cymatiidae in this area.

A visit to one small reef outcrop and adjacent area to the east of Puponga Point resulted in 43 C. spengleri and 9 Monoplex australasiae being located. In addition another shell collector in the same vicinity at the time collected approx. 7 C. spengleri. A lot of the C. spengleri on the reef were in the growth stage with very thin and flexible lips. Care was needed to remove them from the rocks without inflicting damage. They had passed through from 3 to 9 growth stages as computed by counting the varix. Assuming one growth stage per annum, this would give their age as 4-9 years. The number of shells found this year was about twice as many as last year and the thought occurs " Where did the additional shells come from and why were no shells less than four years old located ? ". The water temperature was 69 degrees F. and it would seem that warm conditions are required for growth.

Many egg clusters were noticed attached to the rock. In one case a C.spengleri was over a cluster and in another case a Monoplex australasiae covered the eggs. Examination of the two animals seemed to indicate that these were actually laying the eggs. No growth was evident on these two shells and it has been stated in connection with other molluscs that egg laying and growth are not usually possible for the animal in the same season. Perhaps it is so for these two species. On the following day the two egg clusters previously mentioned were collected. Examination of the two egg sacs and later of the molluscan larvae themselves revealed no real differences. The question arises, therefore, were the animals found on the eggs responsible for their deposit ? If so, Monoplex australasiae and C. spengleri eggs and larvae appear to be similar. In a previous newsletter (Aug.1959) Mr.Hipkins has given drawings and some notes relating to C. spengleri egg clusters. Our examination revelaed a similar picture. 150 to 200 sacs per cluster were counted, each sac containing 2000 - 3000 larva, giving a total of 300,000 - 600,000 larva per cluster. The sacs were first examined under a microscope some 24 hours after finding the animal on the eggs, and the actual larval shells were clearly apparent. Some movement of the shells and what appeared to be currents set up in the cell liquid was visible. The sacs were kept in a aereated container and after $1\frac{1}{2}$ days most of the sacs had opened, liberating the larva, when it could be seen that the shells were in the Veliger larval stage. The cilia were now clearly visible in rapid movement. Growth continued for six days with the protuding portions of the animal seeming to grow, when the experiment came to a sad end. A smaller, unknown, microscopic animal bred at a great rate and many were seen to attack each molluscan Veliger. Soon, all were eaten. Several larval shells were preserved for microscopic work.

It is assumed that the larva are usually liberated into the plankton to settle later and grow. Where do they develop and why do we not find shells with less than three growth stages ? Much more work is obviously required.

C. spengleri have been found on the Western side of Puponga Point, but usually rather stunted in growth. C. spengleri & Monoplex australasiae occur in the Hui-Kakamatua area and seem fairly plentiful and in good condition.

C. waterhousei segregata and C. bolteniana are found so infrequently that no definite habitat can yet be specified.

This paper is an attempt to put on record some of the authors observations in the hope that future work may reveal more of the life cycle of a very interesting family.

--oOo--

The article and illustrations of the N.Z. Volutes are being held over until next issue when we hope to present two pages of excellent figures by Mr. Hipkins.

--oOo--

CHARONIA RUBICUNDA — MANAKAU HARBOUR.

Date	No.of specimens	Locality where found	By whom found	Remarks.
1954	2	Western side Puponga Point.	Mr.Beveridge	Miss.M.Gillmans collection
1955	1	ditto	Mr.A.H.Jones	Mr.Jones Collection.
1956-58	6	"	Mr. A.H.Jones	" " "
1958 April	3	"	Local residents	Miss M. Gillamsn collection.
1958	1	Huia-Kakamatua	Mr.N.Farley	From Zostera grass near low tide.
1958	1 ??	ditto	Mr.D.Farley	species not definite.
1962	1	Huia	Mrs.G.Barker	Mr.& Mrs.Barkers collection.
1963	1	Mill Bay	Mr.S.Ayling	Aylings collection.

CHARONIA CAPAX — MANAKAU HARBOUR.

??	1	10fths.off Paratutai	N.Mander Skin diver	Mr.Jones collection.
1958 May.	1	East of Puponga Pt	Mr.Hipkins	Manakau Survey collec tion.
1958 April	1	?	Local residents	190 X 133 m.m. Miss M.Gillmans collection.

--oOo--

The N.Z.Tellinas, and where to find them.

by T.P.Warren.

The shells of this group are among the larger, and more attractive of our local bi-valves; moreover, with the odd exception that they are not of particular rarity though sometimes elusive, so that this is one family we may have well represented in our collections without the usual expenditure of " blood, sweat and tears".

--oOo--

Macomona liliana (Iredale, 1915) is probably the commonest one, a shell which likes fine sand with a bit of mud, usually found in estuarine situations or at the entrance to harbours. I have good specimens from Whangateau, Nelson and Mahurangi, but the best place of all seems to be Cheltenham Beach, Devonport, where really large ones are found, and these are usually tinged inside with orange-yellow, giving them a very attractive appearance.

Angulus is a genus of three species, A.spenceri (Suter, 1907) being the rare one. It is mostly found on the Bay of Plenty beaches e.g. Whitianga, Ohope, and Opotiki which is the type locality. Suter lists it also from Akaroa and New Brighton and there may be other places where it will be recorded as well.

Angulus gaimardi (Iredale, 1915) is the one named in Suter as Tellina alba. This is a very thin shell of quite large dimensions, in some lights appearing almost pearly in texture. In this species the beaks are closer to the anterior end and the ligament is very short. The epidermis if present at all is very thin. They mostly live in a couple of fathoms off shore, but are often washed up alive during storms. Good locations are Nelson, Orewa, Waiwera, and sometimes at Muriwai, although not so common there. It is also recorded from the Bay of Plenty, at the Mount, Whitianga and Ohope.

Angulus edgari is very similar in appearance, but is a more solid looking shell, usually possessing an epidermis of a brownish shade and the beaks are more central. This, together with the fact that the ligament is longer, is the most reliable way of separating the two species. In the Manual. A.edgari is listed as Tellina glabrella. I have collected it at Orewa, Waiwera, Red Beach (Whangaparaoa) and have seen the odd valve on Whangateau Beach, though no complete shells. It would be of interest to have records of this species from southern localities.

Zearcopagia disculus is, as its name suggests, of rather circular outline. It is always quite unmistakeable with its strong concentric striations and patch of bright orange yellow at the umbones. This one lives in sand around coastal situations but I have more often found it washed up in rocky places than on sandy beaches. Quite common at Goat Island Beach and Ti Point, also Mahurangi, Waiwera, Whangaparaoa and some Auckland beaches. Found also further south in the Bay of Plenty, Wellington and Nelson. Has been recorded in the Chathams.

Tellinella is found mainly in deeper offshore waters though one species, T.cugonia (Suter,1913) has been found at extreme low tide at Great Barrier and one or two mainland localities. Most specimens are about a quarter inch in length, but a few have shown that a fully grown shell can be up to an inch long. Looking a bit like Angulus in shape, the shell is quite unmistakeable as it is covered with strong concentric str iations. Fresh specimens are brownish in colour outside and pure white within.

Tellinella huttoni (E.A.Smith, 1885) is a small translucent shell mostly of a pretty pink or flesh colour, sometimes washed ashore in Golden Bay, but mostly only obtainable by dredging. It would appear to be common at Paterson Inlet, Stewart Island, and Queen Charlotte Sound. This is a very fragile shell, easily damaged, so that good specimens are quite rare. The subspecies sterrha (Suter,1913) is a variety of doubtful value and will likely prove to be a synonym of T.huttoni huttoni.

--oOo--

11
33

NEW BOOKS AVAILABLE for lending .

The Librarian

SHELL LIFE. An introduction to the British Molluscs by Edward Step.

Note: Shell life is a popular introduction to the Mollusca of the British Isles. Chapters deal in a familiar way with the principal facts relating to structure, organisation and habits of several types of molluscan life. All the Natural Orders and Families with most of the Genera and many species are described and figured, with much information regarding localities mode of life and the relation of form, colour and ornamentation, to habit. Excellent conchological reading.

--oOo--

SEA SHELLS OF THE WORLD ; 790 illustrations in full colour. A guide to better known species.

For a paper covered book of its size, it is remarkable for the amount of information it contains. Some 80 Cypraea from America, Africa, Panamic (Pacific), Australia and Indo-Pacific are illustrated as well as the better known species such as :- Helmets,Olives,Murex,Conus, Miters Tulips, Abalone etc.

UNDERWATER SHELL COLLECTORS.

S.R. & A.M. Ayling.

While on a recent skin-diving trip to Ti-Point near Leigh, it quickly became apparent that we were not the only underwater shell collectors. Some 50 yards off shore, in 10-15 feet of water were large rocks, interspersed with sandy clearings. The rocks, just clear of the main current flow had become the home of an octopus colony. Their homes are merely excavations in the sand under the edge of the rocks, or in some cases, a convenient crevice into which the animal has squeezed. Each "home" is however distinguished quite clearly by a scattering of newly opened and cleaned shells in its immediate vicinity. These fresh shells are in contrast to the usual bleached debris lying on the sandy sea bottom.

In this Octopus colony there were some twenty animals, while a short distance up the coast, in similar conditions, was another colony of about the same size. Evidently the hunting in this area was good, judged by octopus standards.

It was evident that two species of molluscs predominated in the Octopus diet, namely Longimactra elongata (& G) and Gari stangeri (Gray). Some of the former were good specimens, 93 mm X 63 mm with epidermis in excellent condition, while the latter reached 58 mm X 33 mm also with good epidermis. Some 50 shells of the two species were seen around each "home" and on disturbing the sand in the vicinity, further specimens were revealed. Evidently the colonies were well established and this was borne out by the size of the animals which were judged to be 3 to 4 feet across the outstretched arms. The dexterity of the octopus must be of a high order for some of the opened G. stangeri were only 25 mm in length and none of the shells showed signs of damage. They had apparently been opened by a steady pull in opposite directions on each valve and not by action of the hard beak of the Octopus.

Most of the octopus were " at home" - they have been described as nocturnal feeders - or perhaps they were scared to safety by the human invasion. However, on returning to the area a little later, one animal was surprised in a sandy clearing sitting in a circular excavation. Some authorities state that the octopus excavates for its home and unearths molluscs by blowing jets of water from its siphon into the sand. We assume that the octopus sees or senses the siphons of the molluscs just protruding above the sandy bottom and proceeds to excavate. It would seem that if successful in capturing the animal, that the octopus returns to its home and there opens and eats his prise, afterwards extending an arm and dropping the shell outside.

While many hair-raising stories are told of Octopus attaching to ones legs when standing in shallow water, it is the experience of skindivers that these animals are very docile indeed, and even when prodded by the finger, merely change their colour, probably in the hope that the new shade will render them invisible. In any case if they keep up the supply of nicely cleaned shells, otherwise difficult to obtain, then as shell collectors we can only be grateful and consider them "friends".

WARNING . Underwater collecting can be thoroughly recommended by the authors but they feel that any persons intending to start, should first be fully trained by competent instructors and afterwards gain experience with a reputable club. There are many dangers for the uninitiated both in the mechanics of diving and in the sea life likely to be encountered.

--oOo--

A new method of 'Land Snail Collecting'??

Phil Warren.

As many of you are aware our house is at the end of a ridge and the garden is bounded on three sides by native bush. Here are wonderful hiding places for introduced pests like Helix aspersa and Oxychilus cellarius and we recently took drastic action against these in the form of a well advertised bait consisting of waterproof pellets containing, - quote, " Lure-204 - for Slugs and Snails".

This preparation was liberally sprinkled round the infested area just before rain in accordance with directions. Some days later the baits were visited, and to our surprise we found not only large numbers of corpses of both the introduced snails, but , in addition quite a few dead Rhytida dunniae, a couple of Thalassohelix zelandiae, and a small Phrixgnathus probably moellendorfi . No dead Slugs were seen close to the bush verge but there were plenty further up close to the house.

One cannot now help but wonder if the method might be of help in the collection of small bush species, and with this idea in mind I have laid baits in one or two other places to see what happens. Any results, either good or bad will be notified in this publication later on.

--oOo--

THE TERRESTRIAL OPERCULATE GENUS LIAREA

Phil Warren.

The snails of this attractive group were admirably monographed by Dr. Powell some eight years ago, but as many collectors may not have access to this particular paper these notes are offered in the hope that intending collectors of these interesting little molluscs will learn where to expect to meet the different species.

Most of them are found only north of Auckland, the three exceptions being L. lepida, L. egea egea, and L. hochstetteri carinella. Of these lepida is the most rare and very restricted in its range, being known only from Northern Wairarapa (Masterton area) through the Manawatu Gorge, and Horowhenua, where odd specimens may still be taken near Levin, e.g. Florida Road, though it is becoming increasingly rare.

It would seem certain that Liarea was once present in central North Island localities but has become extinct during the Pleistocene volcanic eruptions. It may be that changes in the course of the Waikato River have prevented later re-population, from the north of some of these places

The species L. hochstetteri is common in large tracts of bush from Kaeo across to Hokianga, then north to Awanui and Doubtless Bay. Further south it can be collected in places from Wellsford down to Waiwera. L. hochstetteri AND its allies seem to prefer the damper parts of the bush and the shells mostly appear broad in proportion to height, and show rather prominent axial striations.

L. hochstetteri alta lives in hilly country around Whangarei and Dargaville where its range would seem to be arther restricted. As the name suggests, the shells are higher in outline than the typical species.

L. hochstetteri carinella is fairly common around the Waitakeres and as far as Muriwai. Also southern Auckland area e.g. Mauku, Tuakau, but continues down through Waitomo to the Awakino Gorge as well as Ohaupo and some parts of the Rotorua area. Dr. Powell has also recorded it from Kawau Is. a most unexpected and remarkable discovery.

L. ornata is another species belonging to the hochstetteri assemblage. This is a small but very pretty shell, smooth to the naked eye, somewhat shining and marked with a zigzag pattern of light and dark brown. It lives in a rather compact area bounded by Wellsford, Leigh and Warkworth, where it is not uncommon under taraire leaves in bush remnants from sea level to seven or eight hundred feet.

Probably the best known species of all is L. egea egea, a small well patterned one found from Waiwera down along the east coast to Coromandel; south of Auckland to Te Awamutu, and Rotorua, Waimai Ranges and the Te Puke area. This one is found on several off-shore islands too, Waiheke, Great and Little Barriers, and one of the Chicken Islands.

A taller sub-species is L. egea tessellata, a most attractive one which occurs at Woodcocks (not far from Warkworth) near Wellsford, then further north between Whangarei and Dargaville, Opononi and Herekino. Like most of the egea series it favours a slightly drier part of the bush and is often in fallen nikau leaves.

In the far Northern block between Spirits Bay and North Cape, lives L. aupouria aupouria, the largest one of all, often exceeding ⅓ inch in height. It too, has a prominent pattern of zigzag markings, more pronounced on specimens from the heights of Unuwhao than those from down the Spirits Bay area. Near Cape Maria this same species may be found sub-recent in sand dunes with the colour pattern still present although faded - an indication that this now barren area was once clothed with native bush at some not too remote date.

Right out at North Cape is Kerr Point, the type locality of a smaller and very local sub-species named L. aupouria tara, not to be found anywhere else.

The remaining species belong to the turriculata group; also a northern one L. turriculata turriculata has a long range from Doubtless Bay down the coast to Whangarei with scattered records from Waipu to Wellsford, then once again becomes fairly common from Puhoi to Albany. It is a tall slender shell, mostly patterned though some are unicoloured, usually about a quarter inch in height, though a population of particularly fine and much larger specimens is often met with at Mount Manaia, Whangarei Heads.

L. turriculata waipoua is naturally located at Waipoua Kauri Forest, and also near Broadwood just to the north. The shells look much wider than typical turriculata and are invariably reddish brown in colour with, in some specimens, a darker band at the base.

Of similar shape and colour, though smaller and shinier is L. turriculata partula, living in patches of bush from just south of Warkworth to Pukapuka. It has recently been found as far to the east coast in this small area, and also to the west of the main road in isolated bush pockets, though not far inland. It is hoped that further collecting in these localities will establish more records of this pretty little shell, which is not so far, well known. Perhaps it might be worth mentioning here that quite a number of bush localities in the middle north would repay investigat-

-ion and perhaps bring further new forms to light.
In any case, it would help to increase our conception of the known the known range of the already named species.

--oOo--

From Frank Climo :-

" I went home for the holidays and did a spot of collecting on Farewell Spit where there were hundreds of Xenophalium pyrum washed up. One appears a most interesting shell, thinner shelled with aperture more oblong than circular and not as squat as usual. Also picked up a large Astraea heliotropium, washed up in perfect condition.

Another point of interest - twice I have found quite large pieces of Tonna on the ocean beach. The piece I picked up last time had the cuticle still attached to it. I may find a whole one washed up on the Spit one of these days !

--oOo--

Two more specimens of Xenophalium royanum have been collected from off Whangaroa in the last couple of months,

Ed.

--oOo--

From Laurie Price :-

" Have had a couple of easterly busters which have brought up some rather interesting wash-ups on Tokerau Beach. Have had three very strenuous one-man field days out there... my best find being 26 Xenophalium pyrum, most being alive in choice condition! Also very acceptable were a large quantity of Gari lineolata & G. stangeri, many being still alive. There were even about a dozen Tonna haurakiensis, alive, but only a single specimen worth keeping, all the rest smashed beyond repair...a sight to make any collector blow a gasket !! Large numbers of Glycymeris modesta and Longimactra elongata, all complete, were there as well as large numbers of the usual common stuff like Alcithoe arabica (maybe a few A.depressa) Struthiolaria papulosa, S.vermis, Penion adustus, Tawera spissa etc.

--oOo--

A few days after this blow your Secretary was also on Tokerau Beach and added to the above collected by Laurie Price were numbers of Xenophalium pyrum in perfect condition some still with their opercs. Xenophalium collactea were collected 48 of them, perfect specs, one of which I rescued as my husband reckoned that it would make a good golf ball !! Some of the heaps of shells were 4' deep, but a S.W.wind was rapidly covering the heaps in sand, and a front end loader helping to remove shells from the beach.

L.Seager.

NOTES OF INTEREST

N. Gardner

A recent addition to the Barker collection :- some very nice specimens of Siliquaria maoria trawled off Patea. This interesting member of the Vermetidae doesn't turn up very often as it usually lives in comparatively deep water.

Described originally from specimens from the Far North of N.Z. by Dr. Powell in Trans. Vol. 70.

Dr. Dell once wrote that in the Cook Strait area this species occurs not uncommonly in clusters in a purplish sponge growth. I did sort out a half grown specimen in shell sand from Kapuwairua a couple of years ago but so far have not heard of any others picked up on shore.

Spec. illustrated

Siliquaria maoria

from the Barker collection.

--oOo--

Mrs.Mabey of Okiwi, Great Barrier Is. must have exper- -ienced a real thrill recently. She writes :-

" It may be of interest to others to hear of the very good wash-up last week on our beach.

Here is some idea of what I found; it is the biggest wash-up I have seen for some years and I was only able to cover a small part of the area before another storm blew up and destroyed everything.

3 Maurea tigris
15 Xenophalium pyrum and a few X.collactea (alive)
3 Cantharidus opalus
50 or more Nemocardium pulchellum (alive)
Dozens of Micrelenchus sanguineus (alive)
Baryspira, several varieties.
1 only Ellatrivia memorata
4 Architectonica reevei
12 Philippia lutea (alive)
3 Notocallista multistriata (alive)
2 Longimactra elongata (alive)
6 Modiolus areolatus
2 dozen Divaricella huttoniana (whole)
Offadesma angasi (one small whole shell and one valve of a two inch shell)
12 Bullinula lineata (10 of these perfect)
4 Pupa kirki
1 Phenatoma novaezelandiae
1 Alcithoe fusus
5 Alcithoe arabica
6 " " " " egg cases
3 Maurea osbornei
6 Modelia granosa
Dozens of Zanea zelandica
8 Poirieria zelandica (good spikes)
Dozens of Struthiolaria papulosa and many more common varieties of shells."

--oOo--

Fusitriton laudandum is looked upon as being a deep water southern shell. Years ago Dr. Powell recorded the occurrence of a washed up specimen on the Ninety Mile Beach. Have heard indirectly that an Auckland fisherman has recently trawled up a further example from the vicinity of Pandora Reef off the Northern tip of N.Z. - depth not certain.

--oOo--

Hitherto all our records for the rare and beautiful deep water Tolema peregrina have been from the Auckland East Coast - Bay of Plenty, Hauraki Gulf and further north. We can now list an example from off the Kaipara Heads on the West Coast. This fairly large specimen is in the collection of Anne and Elizabeth Turner.

WHY Some Molluscs are Left-handed.

Bill Rudman.

Although this is usually considered an unsolved problem, T.H.Morgan published in 1927 a work on " Experimental Embryology" in which he discussed the direction of coiling in Lymnaea - the pond snail.

Since 1927 much work has been done in the field of embryology and more is known about why some Gastropods normally right handed, develop into freak sinistral specimens.

But first a few terms had better be explained. The fundamental 'living unit' is the cell, just as the fundamental unit of the universe is the atom. The two main parts of the cell are the nucleus - the control centre - , and the cytoplasm, which is the body of the cell.

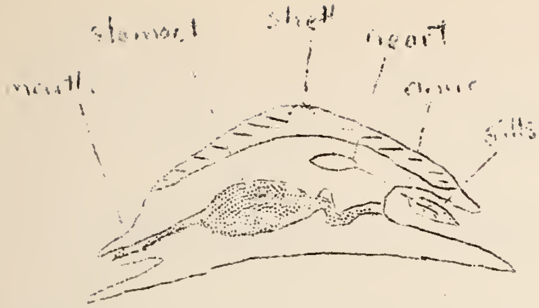
A fertilised egg cane be considered to be an independent cell. After fertilisation the egg undergoes a period of CLEAVAGE in which the single cell divides up into a number of cells called BLASTOMERES. Although not strictly true it can be said that each blastomere is important in the development of different organs. Therefore the original positioning of the blastomeres is important when the animal developing is not symmetrical.

Now a little evolutionary theory - A long time ago, gastropods were symmetrical and had a mouth at one end and gills and excretory organs at the other. For a number of reasons this proved to be an unsatisfactory arrangement and a mollusc appeared in which the whole body had twisted round through 180 degrees, so that the gills (originally at the rear) were now situated above the mouth. See Fig. 1.

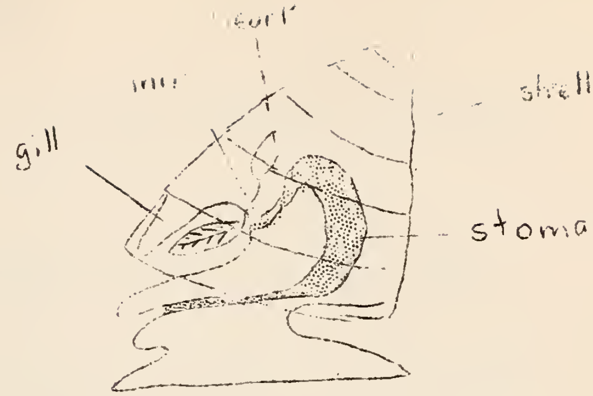
This mollusc had a distinct advantage over its more conservative brethren and so they died out and all modern molluscs go through this 'twisting' rpocess early in their life cycle. The process is known as TORSION.

After torsion, something had to be done with the large mass of " innards" the visceral hump - which had been shifted to an unstable position on top of the animal. This was overcome by spiral coiling which appears in many gastropods. Spiral coiling reduced the hump into a more manageable position.

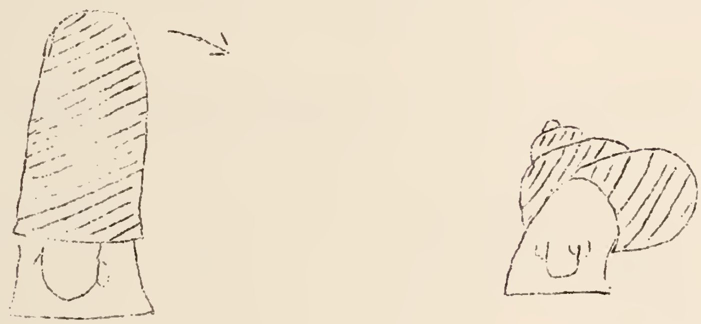
Originally, the spiral shell would have been like that of Planorbis or Spirula but gradually it inclined to one side to present a compact and stable structure. Why it inclined to the right and produced a dextral shell is one of those mysteries - probably the luck of the draw. But once



Primitive Snail before Torsion



Modern Snail showing Torsion.

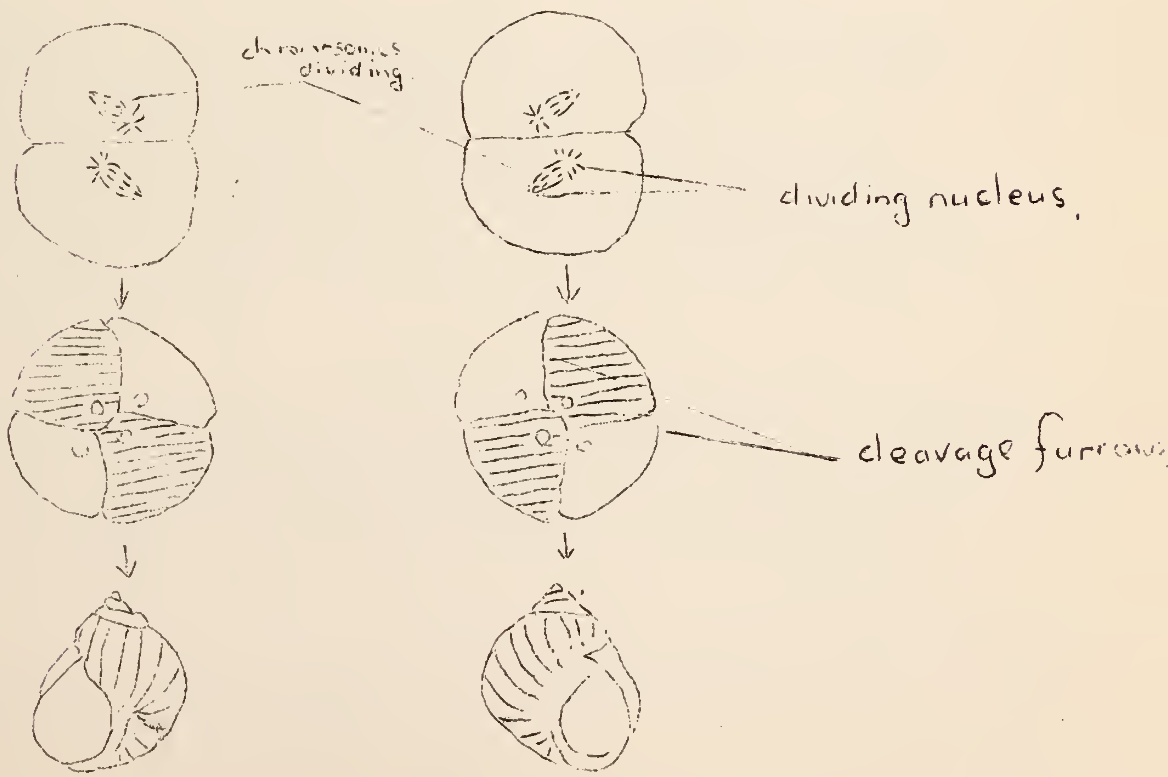


Shell gradually inclined to one side to present a more stable structure

DIAG. (2)

DIAG (3)

DIAG. (4).



Diagrams. 2 – 6. after MORGAN.

gastropods become dextral they stayed like that except for some odd cases, for much the same reason that white skinned people stay white - heredity.

Because of coiling, the organs on one side, of a shell's body are lost or greatly reduced e.g. in many gastropods reight gill and right kidney are absent.

This assymetry of organs brings us back to the point that the blastomeres are connected with the development of separate organs. If the positioning of the blastomeres is changed, so will be the positioning of the reduced and normal organs. Thus, the blastomeres or rather their positions control the direction in which the shell coils.

Morgan showed that this was so in the work he did from which the diagrams come.

Diag.2. Ist division of the egg has taken place and the 2nd cleavage is taking place. The direction in which the nuclei are dividing is important. The dotted lines between the two split nuclei represent chromosomes, which also divide, and which control heredity.

Diag. 3. 2nd Cleavage has taken place and the blastomeres with the 'new' nuclei are shown shaded.

Diag.4. The resulting left and right spirals are a direct result of the direction of the cleavage furrows which are determined by genetic factors.
In shells normally 'right-handed' the nuclei have a predominance of 'right handedness' in their make-up. When one gains a predominance of left handedness, the shell is termed a 'freak' because it coils to the left. It is a very similar occurrence to that causing right and left handed people.

--oOo--

Mr. Harry Johnston, Seddonville writes of an excursion back into the Paryphanta rotella area south of the settlement, principally to investigate a cave in which a moa skeleton had been found some time previously. He saw only one empty Paryphanta at the type locality. They seem very scarce.

Amongst the several limestone rock specimens sent up for inspection, was the valve of a large oyster and also a naturally polished sample of 'sectioned' small shells - some showing the internal structure.

Editor,

--oOo--

The N.Z. Volutes

N.Gardner.

The Volutes of N.Z. occur practically right round the Coast line of the country; however only two or three species inhabit the shallow areas where they are obtain--able.by the average collector either as live specimens or wash-ups.

The rest are restricted to certain areas of deeper water which means we are dependent on fishing trawlers or scientific expeditions for examples for our collections.

The known benthic range of the group in N.Z. is from low tide to 400 fathoms. At this latter depth some very fine new shells have been secured recently in northern waters.

Representing Volutidae in N.Z. are the following genera and subgenera. :-

Alcithoe	-	9 species and sub-species.
Leporemax		4 species and sub-species.
Pachymelon		3 species
Teremelon		1 species
Iredalina		2 species.

Alcithoe

The well known A. arabica is the genotype of Alcithoe.

1. Important features are :- " Secondary scalpelloid nucleus, 4 or 5 columella plaits, sometimes 6 or 7 but never below 4 even in brefic stage.

Deep broad anterior notch of the aperture causing a prominent fasciole.

A.arabica Martyn

Fig. 1.

A rather large shell, solid, strongly nodulous, usually fulvous with dak zigzag markings, often arranged in 3 or 4 bands around the body whorl.

Sprie high, more or less turretted; its height about equal to half the height of the aperture. Body whorl is slightly inflated at the middle and contracted slightly below.

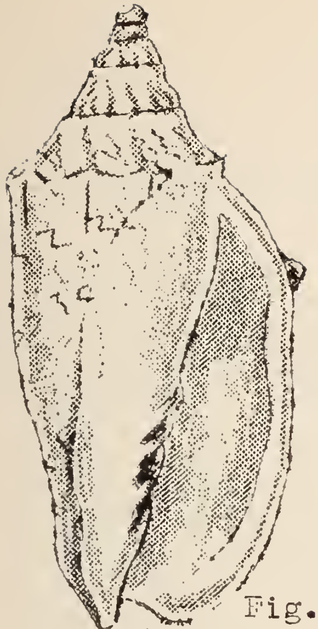


Fig.2.

Fig.3.

Fig.5.

Fig.4.

Fig.1.

..K.Hipkins.

Columella with 5 string plaits, very occasionally only 4 are present.

Grows up to 126 m.m. and has strong inner lip flange.

Lives mostly on mud and sand banks at extreme low tide down to about 15 fathoms according to Suter's Manual.

Range :- More plentiful about Auckland but has been taken as far to the south as Nelson. This shell has been known as Cymbiola pacifica Swainson and was brought to England by Captain Cook.

A. depressa Suter

Fig. 2.

This species is distinguished from arabica by the shape of the low spire. " - whivh is almost regularly conic, caused by the suture being almost on the line of the shoulder tubercles."

The species is considerably smaller than arabica and is a thick heavy shell. Specimens from the type locality, Spirits Bay, have a cream ground colour often without markings. It has an inner lip flange as in other shallow water species. Often confused with small examples of arabica.

Range :- Restricted to the Far North - Spirits Bay, Waikuku Beach, Houhora, Tokerau.

Length :- 80 m.m.

Fossil specimens occur at Castlecliff, Wanganui.

A. jaculoides Powell.

Fig. 3.

Differs from the genotype by having a narrow slender outline, fewer nodules, the high outer lip and the absence of the inner lip flange. The shell is not as heavy as A. arabica and A.depressa. Colour pattern somewhat similar to A.arabica.

The type of A. jaculoides is a comparatively small shell. Size :- 109 m.m. X 41 m.m.

Range :- Appears to be limited to the Auckland East Coast, from East Cape northwards in deep water, 30 fathoms or more.

A. johnstoni Powell

Fig. 4.

Larger than true jaculoides and has the following major points of difference :-

A. large evenly flared outer lip.

B. Weaker nodules and none at all on the last half whorl.

C. Often with a fairly dense colour pattern.

There is no inner lip flange.

Size :- 159 m.m. X 65 m.m.

Range :- This species appears to be restricted to the Bay of Plenty. Many of the specimens known seem to have come from the vicinity of Motiti Is.

A. swainsoni Marwick

Fig. 6.

" Distinguished from A.arabica by its more elongate form, the convex, not shouldered whorls and the total absence of nodules."

Colour often as in arabica but some specimens are of plain colour without any markings.

Whorls moderately convex and body whorl rounded. Columella plaits 4 to 6 usually 5 however. Has strong inner lip flange. Grows up to 170 m.m. in deep water.

The type specimen is a fossil shell from the Kai-Iwi beds.

Range :- Quite extensive, most of the South Is. and up both coasts of the North Is. to the Ninety Mile Beach on the West and occasionally as far as Waiheke Is and Leigh on the East.

Known previously as Voluta elonga Swainson.

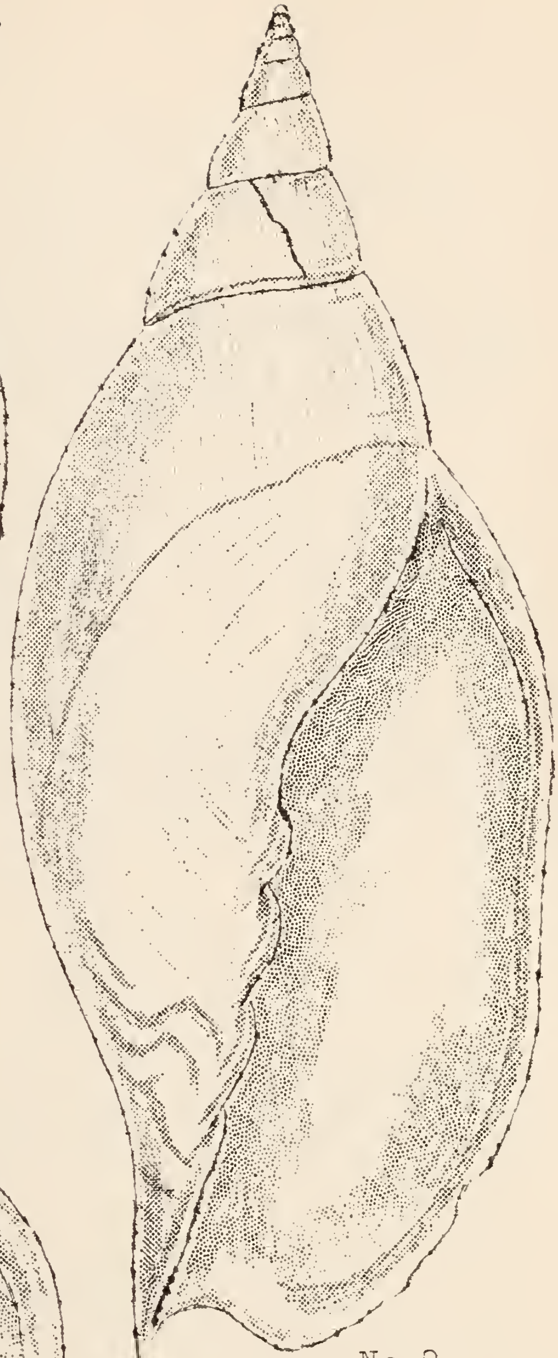
A. swainsoni motutaraensis Powell

Fig. 7.

Appears to occur only on the Auckland West Coast, mainly between Waikato Heads and Muriwai, where it is known chiefly by wash-ups. It is a small short spired buff coloured shell, without markings.

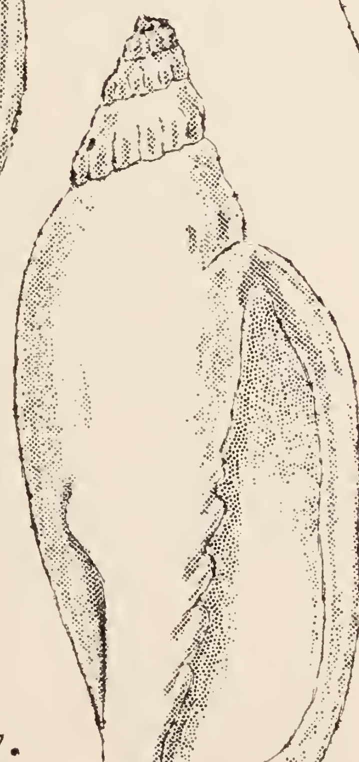
Size :- 95 m.m. X 50 m.m.

No.8.



No.9.

No.6.



No.7.

K.Hipkins.

A. calva Powell

Fig. 5.

A large shell with a tall spire and rounded outer lip.
Usually lacking in colour pattern.

Examples from the Cook Strait area are generally quite smooth but those from the South limit of the range of this species (Otago Heads) exhibit some degree of nodulation.

Size. :- 165 m.m. X 62 m.m.

Range :- Otago Heads northwards to the southern part of the North Island in moderately deep water.

A. larochei Marwick

Fig. 8.

" Shell large, strong, broadly fusiform. Spire $\frac{1}{3}$ height of aperture, apex with indications of the blunt axials. Body inflated. Outer lip convex, thickened, reflexed, ascending high on penultimate whorl. 4 folds on columella."
No colour pattern, no flange.

Type specimen 98 m.m. X 46 m.m.

Range :- From Cook Strait area up to Bay of Plenty on East Coast.

The illustrated specimen is from Tokomaru Bay, East Cape. Cook Strait examples are larger and appear to merge with ostenfeldi.

Located in deep water.

A. ostenfeldi Iredale

Fig. 9.

Quite a large shell, having a decidedly inflated body whorl, and the outer lip evenly curved. No nodules even on upper whorls. Buff colour with no colour pattern. Columella with 4 folds.

Size :- 160 m.m. X 80 m.m.

Range :- occurs mainly off the West Coast of the South Is., down as far as Greymouth. 20 fathoms and below.

Also recorded from Cook Strait and the West Coast of the North Island to just south of Auckland.
Illustrations natural size.

The Karamea

Peter B. Hutton

" Come to Sunny Nelson!" The weather improved to an unpleasant drizzle this morning - we had a go at the Pass - bushcrashing in the wet, then out of the trees and sidled on to a low saddle looming dimly through the murk. Is this the Pass ? There's a hut not far down - you could see it, if it wasn't for the cloud. Down we go, and then stop because the creek takes a 500 foot leap into a wall of grey fog. So here we are, camped in the driving rain. Every movement is a major operation ."

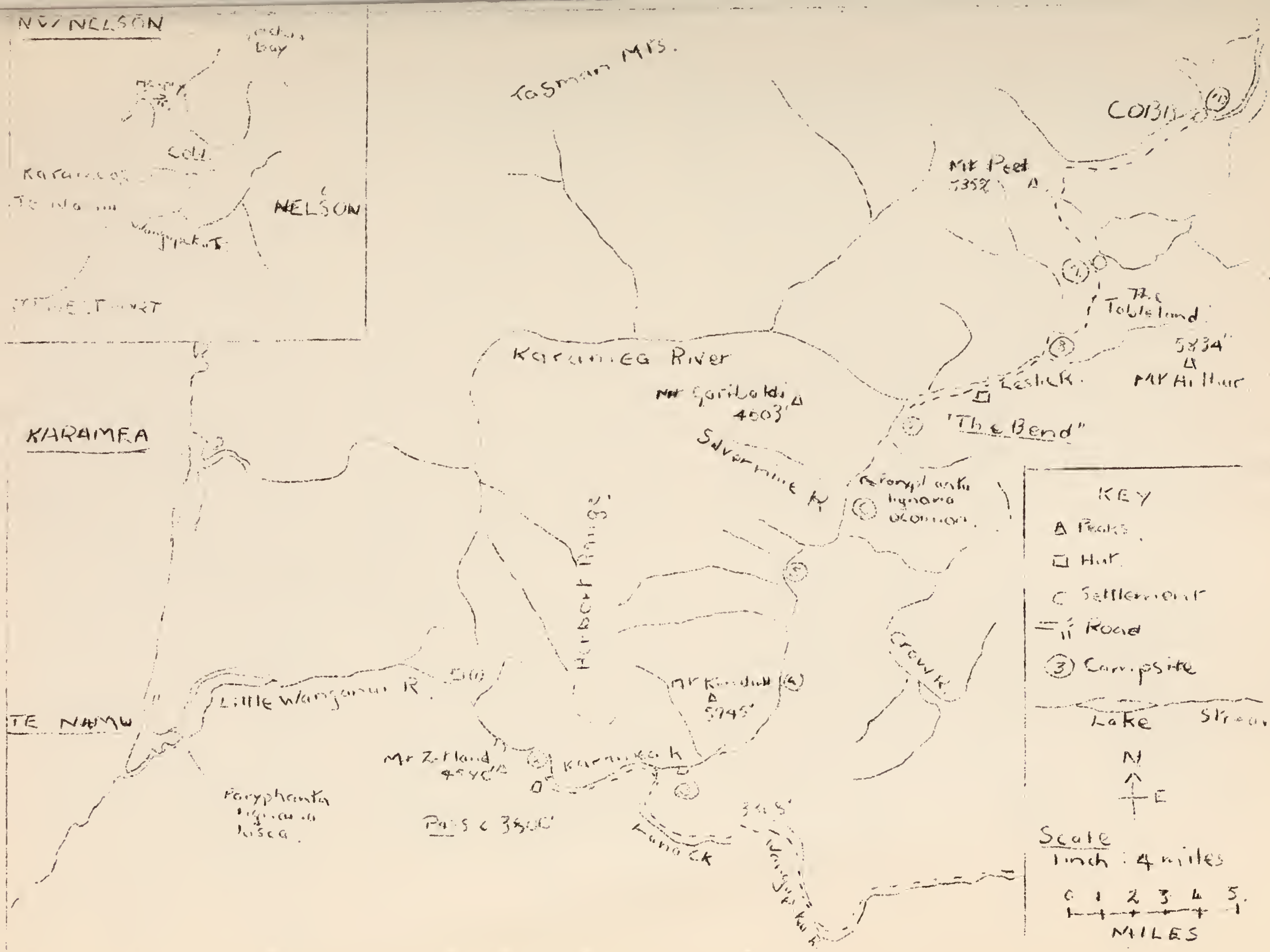
This is from a diary written on the first of two trips to N.W. Nelson.

In Westland the rain has to be experienced to be believed. On my first trip, in twelve hours we had 8½ inches. The whole hillside behind us became awash to a depth of some inches, obstructions such as tree roots forming waterfalls. We adapted ourselves to this by placing a thick layer of moss (We were in Silver Beech Goblin Forest) in the tents and allowing the water to run underneath us. We slept in the tents for a whole day while the storm raged. Our sleeping bags became wet, our hands developed the dishwashing crinkly look and stayed that way for four days. We kept warm by wearing parkas to bed, putting our legs in long plastic bags. Cooking was done in the tents on a primus. Then came the day described in the diary extract which ended in the tussock above a waterfall. The tents were suspended uncomfortably across a water course by our river rope hung between two rock ridges. We woke in the middle of the night with sleeping bags in a puddle of water, but there was nothing to do except eat chocolate to keep warm. In the morning we decided that the loss of some three days, and flooded rivers ahead, would not make it possible to get to Nelson on our planned route.

We made good time on our return down the ridge. The Little Wanganui River was flooded and took an hour to cross with the rope. We decided to recross the river lower down to avoid climbing a bluff, but could not get past the cliffs and were forced by nightfall to camp at the mouth of the gorge.

The river was lower in the morning, and we managed to corss by leaping one swift narrow place and swinging the packs over on a rope. We stayed the night in a gloriously dry hut, where our hands regained their normal texture and we cooked a steam pudding.

The next day we caught a bus to Karamea and there decided to walk the sixty miles through the Heaphy Track to Collingwood. I collected Paryphanta superba harveyi just before coming out onto the tussock, and P. gilliesi jamesoni on the Gouland Downs. Our most enjoyable day was undoubtedly spent climbing over Mt. Gouland (4816') to a deerstalkers'


NELSON
KARAMEA
Tasman Mts.
Mt Peel
The Tableland
5834'
Mt Arthur
Karamea River
4503'
"The Bend"
Silvermine R.
Herbert Range
Little Wanganui R.
Mt Kendall
5945'
Pass c 3800'
Crow R.
KEY
Peaks
Hut
Settlement
Road
Campsite
Lake
Stream
N
E
Scale
1 inch : 4 miles
0 1 2 3 4 5
MILES

camp, where we were presented with venison. On our last night it rained about $7\frac{1}{2}$ inches. We were stuck on the wrong side of the Brown River - with civilization only six miles away ! About midday the river had dropped sufficiently to cross using a rope as a handrail. We arrived at Takaka by rail car.

I decided that I wished to try the Karamea River again the following year. I was the only member of the first trip who went on the second. This was completely successful - we followed the route shown on the map.

I found Paryphanta lignaria lignaria across the Mokihinui Bridge, and P. lignaria lusca at Glass-eye Creek, but no snails up the Little Wanganui River or the headwaters of the Karamea. They could be there, however, The presence of a large colony is usually indicated on the march by the numerous dead shells multilated by the wekas.

The weather for the first week followed an interesting pattern; clear skies in the morning becoming overcast down to 3500 feet in the afternoons. We had no rain in this period. The track over the Pass was non-existant in places.

On our first day past Luna Creek we passed a lake formed by a slip. In it lazily swam innumerable trout. Every few seconds one would jump. Unfortunately there were also lush nettles growing by the lake. John was badly stung, but we did not realize this immediately. Only later in the afternoon did he develop symptoms; pins and needles spreading upwards, total lack of saliva, high temperature and lack of muscular coordination. We washed the stings with soap and water, put him to bed and made him drink lots of milk. He only vaguely remembers the afternoon. He wore longs the rest of the trip! The rest of us were stung but did not re-act. John seemed fit and well next morning but after a few hours tired rapidly and started getting the previous symptoms. After bathing his leg again we divided out the contents of his pack. From then on he went well.

At 4.30.p.m. we came to a large slip and a series of bluffs. The river was flowing too swiftly to cross, so we spent two hours climbing 500 feet over the bluffs, arriving 200 yards downstream. There were more bluffs next morning and it took us six hours to go a mile. From then on past the Crow River (a big flood obstacle) it was an easy scrabble for two days to the Leslie River. Near the Karamea Bend 1..I found dead shells of Paryphanta lignaria o'connori. On all the outside bends there is a convenient ledge between the river and the hills behind. The beech forest is open and easy to go through. The difficult parts are on the inside bends where slips have brought large logs to lie balanced precariously on the rocks. Here, bush lawyer, nettles and divaricating shrubs make going unpleasant.

The Leslie River has two huts frequented by trout fishermen. On our eighth day we crawled the three thousand feet up to the Tableland catching glorious glimpses of valleys below us. We found Balloon Hut was like a cow barn, with large holes in the walls and straw for a bed. The wind was bitterly cold but for the first time we were not bothered by mosquitoes or the special giant breed of West Coast sandfly. These had been terrible especially when we were cooking or putting on our boots.

The next morning the wind dropped and the rain ceased, but cloud still drifted over the tussock. We set off carefully by map and compass to Lake Peel 4,500 feet. and down to the Cobb Reservoir. We were invited to stay at the Visitors Lodge (free of charge !) complete with hot showers and took a taxi to Takaka next day.

--oOo--

Notes of interest :-

From Laurie Price of Kaitaia :-

" About three weeks ago I took a run over to Kaikohe and 17 miles towards Opononi to a place called Waima. Thought that if those dandy Phrixgnathus murdochi are recorded at Rawene and yours from Opononi, then they could be here. Sure enough I found a couple of live specimens. It took me just 2 hours to turn up the first one though, then saw several old dead shells, plus another live one in the next hour and then it was time to be going home.- have to have another go one day and should be able to get straight on to them next time.

Fine large specimens of what appears to be P. ariel were rather common here - got 30. Also in a bit of leaf mould brought back were two of the rare Cytora aranea , a fine ribbed Mocella and a solitary specimen of a White Phrixgnathus possibly compressa."

--oOo--

Labrum :-

is the exterior side of the aperture in univalves. It is measured from where it joins the body whorl to where it joins the inner lip below.

The following terms are used to describe types :-

elated	=	expanded
dentated	=	with large teeth
denticulated	=	studded with small teeth
digitated	=	drawn into lobes
inflected	=	turned inwards
reflexed	=	turned outwards - thickened.

Ed.

--oOo--

In the Section Library is now Caribbean Seashells by Warmke & Tucker Abbott. Available for members on loan.

METHOD OF PROTECTION.

One of the most interesting features to be seen in Nudibranchs (shellfish without shells) are the feathery outgrowths which function as secondary gills. One group of these Nudibranchs has these in the form of a ring at the hinder end of the body. Another has numerous fine fingerlike processes (cerata) all along the back and the third has the feathery processes growing out of the sides of the body.

The members of the second group feed on sea-anemones and such like, all of which have stinging cells on their tentacles. When the sea-slug devours these cells they are not destroyed but, as they pass through the gut are in some way diverted into the cerata where they accumulate near the top and can be used to deter enemies, in the same way as the sea anemones, the original owners.

--oOo--

Pacific Northwest Shell News Vol.3 contains an interesting article ontheir local Panope which is very similar to our own. Part of it is as follows :-

Goeduc (Panope generosa Gould)

The shell of this clam is chalky white and marked with coarse circular growth rings. Its surface is covered with a dirty yellow wrinkled skin. The shell is almost square, the basal and hinge margins being nearly parallel. The blunt posterior margin gapes broadly to allow for the projection of the 12 inch siphon. The siphon, covered by smooth skin cannot be drawn completely into the shell, nor can the valves be closed all the way. The Goeduc lives from 18 inches to 6 feet below the surface of the mud or sand, and obtains a weight of 6 to 10 lbs. Contrary to popular belief the Goeduc does not dig deeper into the ground to escape capture, as the foot of the adult clam is too small to permit active digging. However, the retraction of the extremely long siphons give the impression the clam is going deeper to evade the digger.

The name Goeduc is thought to be an Indian one and is locally pronounced " Gooey Duck."

--oOo--

Our next issue of "Poirieria" will be devoted to a review of our Reunion proceedings and will include the lectures by our Guest Speakers.

--oOo--

NOTES OF INTEREST.

Although the landsnail Rhytida occurs in one form or another on most of our northern outlying islands, I have not previously heard of its presence on Great Barrier Is.

During the big storm earlier this year, an ancient bleached example was picked up on the beach at Okiwi by Mrs Mabey, and sent up for identification. Not infrequently such land snails wash down streams in floods and then along beaches.

At a later date Mrs Mabey succeeded in locating a further freshly dead example in nearby bush. This is Rhytida greenwoodi with the pale umbilical region.

--oOo--

Speaking of land snails washing down streams and rivers - this happens frequently on the West Nelson Coast, where amongst driftwood washed up high one can gather Paryphanta shells mostly superba type, for the most part minus apex and stained black and wellworn, which have come down some of the big rivers from the "tops" of several thousand feet.

--oOo--

We have been in the habit of looking on the golden volute Iredalina as typically southern in distribution. As a result of some very deep water trawls in the Bay of Plenty and further north, we will have to revise our present ideas on distribution. These trawls produced examples of the rarer Iredalina mirabilis. One fine specimen is in the Turner collection.

--oOo--

Some of the introduced European land snails certainly ' get around', for, in a sample of small sea shells from the Chatham Is. received recently by Captain Short, was a specimen of the snail Hyalinia cellaria.

--oOo--

Our Kaitaia member, Laurie Price who has been collecting land snails on Lord Howe Is. for Dr. Solen Chicago Museum, writes :-

.....have been on the Island just on two weeks now, and have been rather busy having a wonderful time amongst the land snails etc. Collecting is very similar to our Three Kings Is. trip - the leaf mould here is almost crawling with small stuff - mainly Palaina in various sizes, plus plenty of the Realiidae and Zonitidae and a few Charopidae, those these latter seem to be more prevalent on the two mountains. Have done most collecting on the smaller peaks up to 800' and once to the top of Mt. Gower, and 2/3rds way up Mt. Lidgbird - boy ! these two are tough going - beats about anything Ive struck in N.Z. so far !!!

The landing slope on Great King would be similar only here it goes up like that for 2500' and 2800' straight from the sea. Much of the time the tops are covered in white most, so one has to pick the right weather of course. This whole Island is more or less covered with thick costal forest and palm groves - out of 3300 acres, only 300 acres are grassy. Most of the houses are closely surrounded with bush and palms and the roads are just tunnels through the trees. Most of the vegetation is new to me, but of greater interest are species obviously related to some of ours in N.Z. - a Kawakawa, much like our mainland one - a Kowhai with yellow seeds and looks exactly like ours - a small leafed variety of nei-nei growing at about 1500' on Mount Gower and Lidgbird, a treefern like a miniature black manuka - water ferns like ours and a fern like our Blechnum.

There are four species of palms, nothing much like ours though - a staghorn ferns seen everywhere, magnificient specimens too,. Also a number of very pretty creepers, all out in flower at this time of the year, including one clematis with small white flowers. Old bleached shells of Placostylus are found in thousands all over from sea level to at least 800' but things don't look too good as regards living ones - though I haven't really looked for them yet. I've seen only a single specimen freshly dead - looks bad indeed, and the cause appears to be - RATS.

Marine collecting so far (as expected) has not produced much - though many species are endemic - one Cellana - one Haliotis, both quite common and one Siphonaria. Most places the rocks appear positively naked, as there appears to be no Acmea whatever, and the Cellana seems mostly to occur in groups. Haven't had much time to look at the reef yet - though some of the things are also common along the Queensland coast. Common bivalves here are the Strawberry Cockle and the Codakia (like our Dosinia style of thing). Also seen a variety of Cardita under stones, and there's still a few small Clams around. About the best find of all though were Janthina globosa - literally hundreds have been coming ashore for the past week or so - all alive - the biggest I've ever seen O collected a hundred or so of the biggest and choicest and have buried them in wet sand to clean out while I'm staying here - if even half of them clean up O.K. they'll be a wonderful lot !! (One of the biggest specimens I've just measured goes 44 mm diameter !!!

--oOo--

THE PROBLEM OF CLEANING SHELLS.

T.P.Warren.

I suppose everyone who becomes interested in Conchology begins in some way by picking up empty shells that have washed up on the beach, assuming the while that said shells have parted with the animals they may have contained long since. But sooner or later one is bound to gather either a live shell or one containing a well concealed hermit crab. These treasures are ultimately placed in one's cabinet or cardboard box or on the mantel-piece or similar receptacle where they are duly admired then forgotten for a while until all of a sudden some dreadful whiff begins to make itself felt. Luckily the culprit is soon located then arises the burning question what to do ? One can either inter it in a remote corner of the garden, or attempt to remove the offensive bod., but how ? The following notes are an attempt to deal painlessly and inoffensively with such situations as above.

Quite obviously limpets are no trouble at all, a quick twist of the knife and the shell is off the rock; another twist and the animal is out. Chitons may be similarly treated if of large size though care should be taken to cut from the head towards the tail to avoid damage to the interior edges of the valves. Then the shell should be firmly tied down on a strip of wood or glass before it is able to curl up. The lot may then be immersed in meths for a week or two when the shell can be removed from its support, dried out in a cool place, after which it should remain perfectly flat. Small specimens, say under an inch to an inch and a half do not need to be cleaned out at all, simply tie them down and soak them well as above and they will remain in good condition.
If your specimens have curled up a bit it may be possible to straighten them out after soaking an hour or two in warm water but care must be taken to avoid breaking the girdle away from the valves. Best to try with some common ones to start to get the right technique.

Bivalves are also quite easy - if they are smaller size than half an inch, a soak in meths. for a week will suffice; any bigger ones are best cleaned out. Never boil them as that will ruin the colour if present. A much better plan is to soak them in fairly hot water and when drowned they will open enough for a small knife blade to be inserted, Slice the adductor muscles through and the valves will open wide; then the rest is a piece of cake. If you wish to display some shells opened out leave them to dry thus, but if you want closed individuals put a rubber band round them and a few turns of string or cotton and leave aside to dry for a week or two; they will then remain closed when the tie is removed. Even freshwater bivalves present no difficulty if processed in hot water.

Should you have the luck to catch a squid or Octopus you may preserve it in a jar of formalin so long as the creature is not too large. A moderately small specimen will fit into an ordinary preserving jar but a "Perfit Seal" should be used as a tin lid will be corroded by the formalin which should be a 50-50 mixture with water for lasting results. Only soft bodied animals should be immersed in formalin, NEVER shells as lime will undergo a chemical change and a chalky-white and extremely brittle specimen of no value at all except as garden manure will result. Methylated spirits is the cheapest and safest brew for shelled molluscs and for fish and insects too, for that matter.

If you want to bring home samples of shell sand or fine dredged material to pick over for small shells the whole lot should be thoroughly soaked in fresh water to remove the salt then dried in shallow trays. When completely dried it can be stored indefinitely in covered jars until required.

Seaweed and stone washings are best washed in water as above then soaked in half meths and half water for a couple of days, after which the residue is dried and stored the same way as shell sand; the meths. treatment will look after any animal matter that might remain.

In case you should desire to collect our usually beautiful Nudibranchs they may mostly be narcotized in expanded condition by placing them in seawater and adding small doses of Epsom salts or Napthalene crystals. After that they can be placed in a weak formalin solution for a day or two, then into a permanent 25 per cent mix. Various scientific papers give several chemical formulae for the permanent preservation of these and other soft bodied animals and all of them stress the need for the specimens to be kept away from light. Whatever you do, the animals will eventually fade, and in my own opinion it is much better to admire the transient beauty of Nudibranchs in their natural haunts and carry away a mental image of them - in other words do not attempt to collect them at all unless for dissection or similar purely scientific study.

As a rule the most difficult shells of all to clean and preserve are the spirally coiled univalves. Generally speaking none should be boiled though large common things such as Cookia, Neothais, Verconella, Cominella, and similar dull-coloured ones may be if time is limited and you have a number to deal with. A much better plan is to soak the shells in a 75% meths 25% water solution for a couple of weeks after which you will be able to acrefully prise the animal out of its shell with a bent wire or nail, or a strong pair of pointed forceps. Should a small piece break off inside you can usually get it out by filling the shell with water several times and shaking vigorously. If not, and its only a little piece it will usually dry to a powder in time without noticeable effect. - Having removed the animal it is always a good plan to rinse the shell a time or two in clean water and if encrusted outside scrub it with an old toothbrush and coarse soap; never treat a shell with oil or acid, this sort of sacrelige is like boiling a goose, you want your specimens to look natural not like custom-built jobs. A point worth remembering is to save the operculum when present and glue it to a piece of cotton wool stuffed into the aperture. Nor should you remove the epidermis from Tonna, Monoplex, Cabestana, or similar, should you be lucky enough to procure live ones.

To revert to cleaning the animals out -- small shells under half and inch need not be emptied. Soak them for a fortnight or three weeks in pure meths. then dry them in a warm dry place. When eventually placed in the collection it is a good plan ro sprinkle a little D.D.T. powder or Napthalene crystals under them to keep out moths, bugs, and silverfish. If you have some shells of too large a size to go into jars of spirit the only alternative to boiling is to bury them in a box of coarse sand in a secluded part of the garden and leave them for about six months. Keep the sand moist but not too wet and in time the animal will rot sufficiently for you to be able to rinse the remains out with water. Of course, you will have some stench to put up with while this is being done, but as long as you are keen enough that will not deter you, anyway. If the nasty smell persists after the shell is dry you may overcome it by pouring shellac into the aperture till the shell is full, the shellac will solidify fairly quickly. I have even used melted candle wax and cement but both have disadvantages, with the former you can get a nasty burn, and the cement makes the shell awfully heavy. Should you get shells from, say, a fishing boat that are dead and smelly but not too rotten the meths treatment is usually O.K. but if they are too far gone, and of reasonable size, the sand burial box is really the best treatment. Ones that have been boiled always seem to fade out in time no matter how good they look for a start, and all the natural gloss goes, too.

Our freshwater gastropods merely require soaking in meths for a few days, with the very small land snails twenty-four hours will be sufficient. Large ones such as Placostylus and Paryphanta are best drowned in freshwater after which about an inch of flabby animal will protrude. They may then be put into meths for a few days and the animal will mostly pull out quite easily after that, but if they are put straight into meths when alive the animal will retract violently and you'll never get it out. The shells require careful treatment when cleaned - care should be taken to ensure that there are no air bubbles under the epidermis before drying otherwise they will break out into unsightly spots. Shells of Paryphanta are temperamental and should be loosely stuffed with cotton wool or else they may collapse, don't stuff too tightly or else they may unwind at the sutures. Excessive heat will also bring about a similar disaster. Small land snails which have been in meths may be found to have bits of leafmould etc. stuck to them. This may be cleaned off with a soft paintbrush and a dish of water. The shells may be stood on a soft towel or clean blotting paper afterwards to dry them off. They are best stored in lengths of glass tubing stoppered at each end with cottonwool - the best method for all tiny shells, for that matter.

Once your shells are cleaned out and thoroughly dried they are ready for the collection. You may keep them in a cabinet of shallow drawers or in large trays - 12" by 18" is a handy size. The individual specimens can be placed in matchbox trays if small enough or in small cardboard box trays. It's all a matter of personal taste or/and what is available. The shells should of course be labelled to be of any value as a collection. The label should include - the Name of the shell, where found, whether alive or dead - high or low tide - or washed ashore, dredged, plus the collectors name where known. To save space I always put the name and locality on the front portion of the label and additional details on the back, but most collectors have their own style of labelling, there is no hard and fast rule to be observed.

Even if your shells are just to decorate the mantelpiece, or the front shelves of the china cabinet in the parlour, it's as well to have them cleaned and docketed and to know at least a little about them, and their habitats and habits.

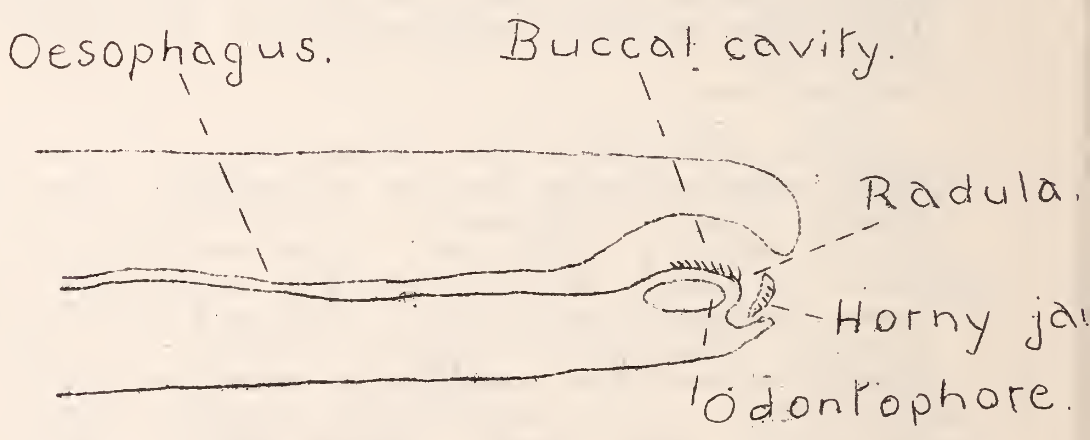
--oOo--

Dentition and Feeding in some of the Cymatiidae.

John Laxton.

The Cymatiidae are a group carnivors. In most carnivores the diet is smaller in bulk and feeding is intermittent as compared with herbivorous molluscs. The style sac (the style sac contains the protostyle which is a rod of mucous, plastered with facces which is continually rotated in the stomach by strong, transversely beating cilia) and sorting area have disappeared and the stomach is itself reduced to a simple bag into which digestive enzymes pass from the digestive gland. Digestion is completely extracelluar, the digestive gland merely secreting enzymes and absorbing. It is now the mouth parts and the buccal mass which are specialized for the task of procuring living animal food.

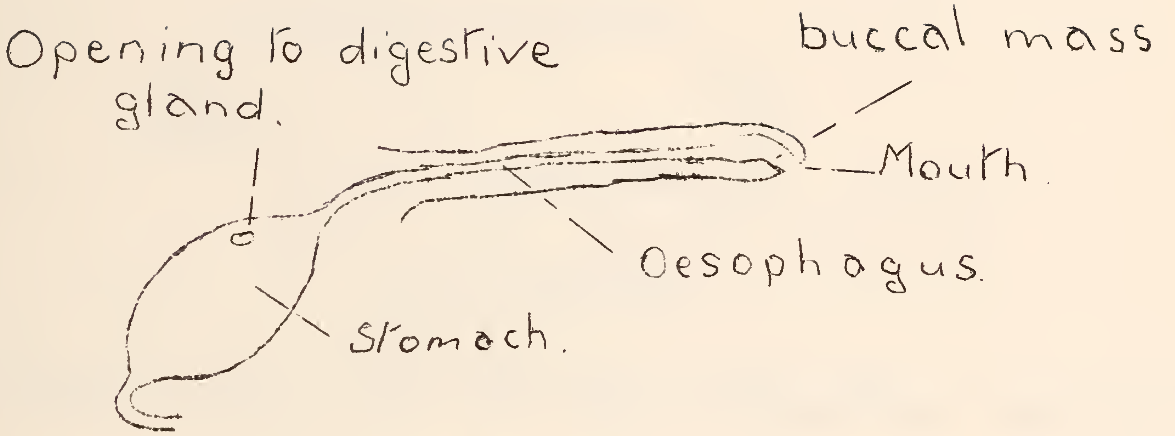
The buccal mass in the Cymatiidae is at the end of a long proboscis .



Side View of proboscis

Attached to the lateral walls of the buccal cavity are a pair of chitinous-edged jaws. They help the animal to grasp their prey. The radula is a strip of clear material bearing many rows of sharp teeth.

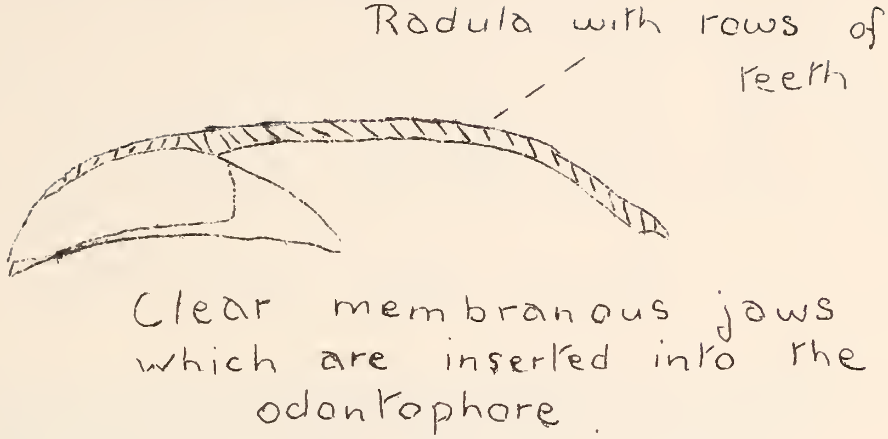
Food is caught and grasped by the jaws while the radula rasps pieces off it. This food is mixed with saliva and passed down the oesophagus to the stomach. In the stomach digestive enzymes are poured on to the particles which are digested. The digested food is now absorbed into the cells of the digestive gland.



Generalised picture of digestive tract.

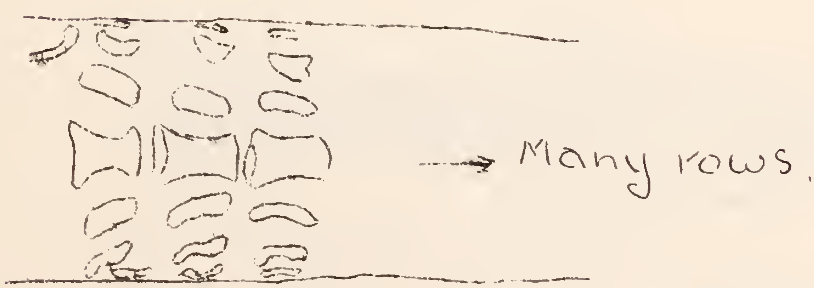
Jaw and Radula of Cabestana spengleri : The jaws are joined together by a piece of clear membrane

They have a very sharp serrated edge.



Side View of Radula (Cabestana spengleri.)

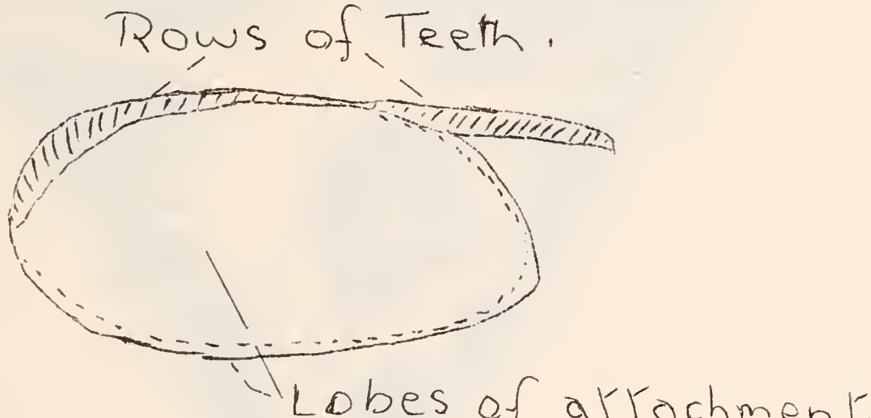
Dorsal View of Radula (Cabestana.)



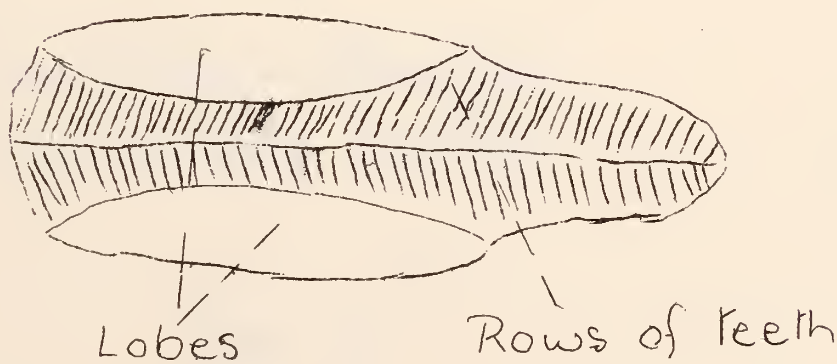
Magnified View of the radula of Cabestana spengleri.

Jaws and radula of Charonia rubicunda.

Jaw, one side only.



Side view of radula. (Charonia.).



Dorsal view of radula (Charonia).

POIRIERIA

Auckland Museum
Conchology Section

Vol. 2

CONCHOLOGY SECTION AUCKLAND INSTITUTE AND MUSEUM.

POIRIERIA.

VOL. 2. PART 1.

NOTES ON N.Z. LITTORINIDAE.

Phil Warren.

The local shells of the above group are not on the whole very popular, probably on account of their small size plus the remoteness of the areas in which many are to be found, e.g. in some of the Southern Isles. However, recent collecting has shown that the genus Zelaxitas is more widespread than was previously supposed; moreover, the number of known species is almost certain to be increased when the group eventually undergoes a critical survey. For any young collector who possesses ambition, a keen eyesight, and access to a microscope, here is a good and so far virtually untouched field awaiting examination.

Melaraphe is the genus we all know well. Represented by only two species, oliveri and cincta the former is by far the most common. But even so good large specimens are not always easy to find. A locality for excellent shells of both types is the Auckland West Coast area, in particular Maori Bay, Muriwai; while I have found the beach round about Lyall Bay Wellington, to be nearly as good. Across the harbour at Eastbourne are fine specimens of oliveri but the cincta from there are smaller. Specimens I have received from Bluff and Stewart Island are of reasonable size and in each case the colour pattern is very well defined. Along the Northland east coast oliveri is extremely common but the shells are mostly small and insignificant. In this locality cincta is very rare, and the shells though large are always eroded and of poor quality.

Next on the list is Laevilitorina, a subAntarctic genus of three known N.Z. species with high conical shells looking a bit like our Dardanula olivacea but very thin and fragile. They live in rock crevices near high water and none are known from the mainland with the result that they are not in many collections.

The same may be said for Macquariella. One species is from the Antipodes Islands and one from Macquarie Island;

however, a third one, aucklandica, is more widely distributed from the Auckland Islands to Stewart Island and the Chathams. In the two latter places, it seems to be reasonably common in shady rocky spots near high tide. This is a very small shell with a superficial resemblance to the tiny Proxiuber.

Zelaxitas is at present represented by six species, all very small shells which at first glance could be taken for Rissoids except that they have an almost transparent though blackish-green appearance when in fresh condition and always possess a large aperture in similar pnoportion to the rest of the shell as in fresh water genus Simlimnea. No certain localities where the named species may be found can as yet be listed as some are already known to have a more extensive range than was at one time supposed; for the present the locality symbols in Dr. Powell's Checklist may be taken as a useful guide for the southern ones though Z.cystophora seems to happen in some northern places. Two Aupourian species alta and iredalei have been found in shell sand near Whangarei Heads together with a probable new species which is also to be met with in sand samples and seawęed washings from coastal areas between Mangawhai and Waiwera. There is another one that may prove to be different in a seaweed washing that I took from rock pools at Island Bay, Wellington. Z.cystophora was found in abundance in the same sample. But until extensive collections are made from all possible localities along both coasts and from the north to the south, it will not be easy to list just how many forms of these rather attractive little shells we have, nor the extent of their specific range.

--oOo--

Something which should be of interest to land snail enthusiasts is the recently discovered examples of a sunburnt Paryphanta from the Mt. Egmont area (North side). We understand that about 4 or 5 specimens have been collected from creek beds and banks etc. The specimen Mrs Duffy had in Auckland was quite large. Believe Dr. Dell has all specimens at Dominion Museum at present.

--oOo--

THE LIMPET

How a limpet is able to cling so tightly to the rocks that a pull of 70 lbs or more may be necessary to remove it, is something of a mystery. It was once thought that the whole foot acted as a sucker, being partially retracted in the centre to create a vacuum. This however, cannot be the answer because when a limpet clinging to a rock was cut in half vertically, each piece remained firmly attached. Part of the foot too is capable of gripping a piece of rock. In any case an ordinary suction vacuum would not require such great force to overcome it.

There is an interesting co-relation between the position of a limpet on a rock and the shape of its shell. Those living on exposed rocks tend to have taller shells with narrower bases than those living in the shelter of rock pools.

The explanation for these differences seems to be connected with the frequency with which the limpet is forced to 'grip' the rocks tightly. Whenever it does so, the mantle is pulled inwards, and if this happens often, it is thought to have the effect of causing the shell to be laid down in a circle of rather smaller diameter than is the case when the mantle is only being pulled in occasionally.

The limpets high degree of adaptation to a rugged shore life is shown by their specialized breathing arrangement. The ancestors which lived right in the sea and not on tidal rocks, possessed the usual pair of feathery shaped plume gills which are typical of the gasteropods. These have been replaced by the modern single continuous gill which is extremely efficient. When the tide goes out a small amount of water is retained in the cavity and this newer gill is able to extract sufficient oxygen from it.

Even when relaxed a limpet will not raise its shell far enough to allow this water to run out. The water retained by the limpet also prevents its body from drying out while the shell is exposed to the air.

It may seem surprising to learn that an animal apparently so primitive has a well developed homing instinct and sense of direction. It is a fact, that when it has finished feeding it always returns to its original position on the rock face where its foot fits into a shallow depression; the edge of its shell conforming exactly to the irregularities of the surface. This conformity may be produced by mutual wear between rock and shell.

Only when it is covered with water, does a limpet become active, although on dull or damp days it sometimes moves about while the tide is out. Unless the sea is very rough its raises its shell after the incoming tide has swept over it, and glides away in search of food.

Like many other gasteropods it is a vegetarian and feeds on small sea weeds, sporelings which develop from spores that settle on rocks. Sometimes on soft rock the scratch marks can be seen - caused by the limpets radula as it scrapes off these sporelings.

- --oOo--

GOSSIP

Saw Friginatica recently for the first time - in Mrs Worthy's collection. She says she now knows of three specimens, all from Marsden Point beaches. This shell is about the size of a Tanea but is taller, white and has spiral ribs running around the whorls.

--oOo--

Also saw in the Worthy collection a very interesting series of Placostylus hongii obtained from one of the islands of the Hen and Chickens. These were small, rather narrow, with a fairly thick outer lip.. A possible new sub-species ?

--oOo--

I wonder how many members have put the new name on their southern Chlamys which we have for years known as C.celator. Dr. Dell checked types at the British Museum and found that Reeve's Chlamys diffenbachi (1858) has priority over Finlay's celator. For the full story see Dr. Dell's paper " Notes on Some N.Z. Mollusca in British Museum". Trans.Roy.Soc.N.Z.Vol.3.

--oOo--

The term Archibenthic has been used several times in this issue. It is used to describe the fauna existing in deep water over and beyond the continental shelf - 100 to 500 fathoms.

--oOo--

Mr. Voyce had on display at our last meeting, a further example of Iredalina from the Bay of Plenty - 200 fths. This is a tall shell of the mirabilis outline. The specimen is from Mr. Booth's collection.

--oOo--

DREDGING IN GOLDEN BAY, NELSON.

Beverley Elliot.

The following is a list of species dredged in Golden Bay during the past few months. Unfortunately a very windy summer has limited the number of dredging trips we have been able to make.

Nucula nitidula	Uncommon - Very attractive specimens, yellow-green rayed with deep orange.
Neilo australis	Single valves only, but an occasional one in cod stomachs.
Monia zelandica	Common; good specimens.
Glycymeris laticostata	Very common. Many old valves, and some live specimens.
Glycymeris modesta	Very common.
Modiolus areolatus	Fairly common.
Ryenella impacta	Fairly common, in their "nests" Some very large specimens, the largest almost $1\frac{3}{4}$".
Gregariella barbata	Not common.
Zelithophaga truncata	Small specimens.
Pecten novaezelandiae	Common, good specimens.
Chlamys zelandiae	Common, in cod's stomachs.
Chlamys suprasilis	Rare, in cod's stomachs.
Chlamys gemmulata	Fairly common, in cod's stomachs.
Chlamys zeelandona	Uncommon, in cod's stomachs,
Pallium convexum	An occasional old valve.
Ostrea charlottae	Common, good specimens.
Ostrea angasi	Common.
Atrina zelandica	Common
Arthritica bifurca	Odd valves.
Venericardia purpurata	Fairly common
Diplodonta striatula	Uncommon.
Marikellia rotunda	Common, living in dead Dosina zelandica shells
Zemyllita stowei	One or two odd valves.
Rochefortula reniformis	Uncommon.
Tellinella eugonia	Two small specimens, in dead Glycymeris laticostata shells
Angulus edgari	Common, alive.
Leptomya retiaria	Fairly common.
Longimactra elongata	Mainly old worn shells, good specimens rare. have not found a live one yet.
Scalpomactra scalpellum	Rare.
Zenatia acinaces	Small single valves only.
Dosinia lambata	Common, alive.
Dosinia maoriana	Three good specimens, one alive.
Notocallista multistriata	An occasional worn valve. A good specimen was found, not by me in a cod

Dosinia zelandica	Common, but not many good specimens, Seldom alive.
Tawera spissa	Very common
Bassina yatei	Not common.
Paphirus largillierti	Common.
Nemocardium pulchellum	Good specimens fairly common in dredge and in cod's stomachs.
Gari lineolata	Common.
Gari stangeri	Not as common as G.lineolata.
Notocorbula zelandica	Very common.
Hiatella australis	Not common.
Panopea zelandica	One small, complete.
Thracia vitrea	A few odd valves.
Offadesma angasi	One small specimen.
Myadora striata	Not common.
Myadora subrostrata	Not common.
Cleidothaerus maorianus	Rather uncommon, nice specimens.

--oOo--

Emarginula striatula	Two specimens, one alive, one dead.
Trochus tiaratus	Very common.
Micrelenchus caelatus	Three specimens, dead.
Maurea cunninghami	One juvenile alive, and a very worn adult that could be M.g.pagoda
Maurea punctulata	Uncommon, Have higher spires than usua specimens.
Astraea heliotropium	One only, alive, but in very poor condition.
Cookia sulcata	Alive, but mainly too encrusted to be of any use.
Lyroseila chathamensis	Several good specimens.
Stephapoma rosea	Rare, very encrusted.
Maoricolpus roseus	Thousands of encrusted dead shells, live sps. also common.
Struthiolaria papulosa	Common, alive, but lack the attractive markings of beach specimens.
Struthiolaria vermis	Fairly common, sometimes alive and in excellent condition.
Maoricrypta monoxyla	Fairly common inside dead univalves.
Sigapatella novaezelandiae	A few small specimens.
Zegalerus tenuis	Very common, good specimens.
Tanea zelandica	Not common, sometimes alive.
Trichosirius inornatus	One dead shell.
Monoplex australasiae	One large adult over 4 inches, and one juvenile, both alive and perfect.
Gumina dolichostoma	One dead shell.
Glaphyrina vulpicolor	Rare, alive.
Buccinulum strebeli	Common, usually rather encrusted.
Penion mandarina	Fairly common, alive.
Penion adusta worthyae	Uncommon, sometimes alive, but seldom in good condition.Usually encrusted.
Penion jeakingsi	
Aeneator otagoensis cookiana	Three perfect live specimens.
Austrofusus glans	Common, alive, but lack the attractiv markings of beach specimens.

Cominella adspersa	Common
Poirieria zelandica	An occasional worn shell.
Zeatrophon ambiguus	Common
Xymenella pusilla	Fairly common, usually dead shells.
Alcithoe sp.	Fairly common, alive.
Baryspira australis	Common, alive.
Baryspira mucronata	Common, some alive, some crab inhabited.
Cryptoconchus porosus	Valves of deep water specimens, usually skinned and eroded.
Acanthochiton zelandicus	Common, but rather small.
Anthochiton canaliculatus	Common. . .
Notoplax cuneata	
Octopus maorum	Not common, mainly small specimens.

--oOo--

URCHINS

Heart urchin, Echinocardium australe very common, alive.
Apatopygus recens Very common in limited locality alive..
Cake urchin , Arachnoides zelandiae and common sea urchin Evechinus chloroticus Occasional live specimens in dredge, but these are more common at low water than in deeper water.

--oOo--

Brachiopods - Terebratella rubicunda Fairly common but seldom in good condition.

--oOo--

AUSTRALIAN COASTAL HAZARD.

A queensland scientist Dr. Robert Endean has announced the identification of a marine killer which has been menacing bathers and fishermen as the " Baby octopus".

Hapalochlaena maculosa was easily identified by distinctive bluish coloured hand markings at intervals round the circumference of each tentacle. It is only 4 to 5 inches from tip to tip of outstretched tentacles but has a very poisonous bite if provoked.

Dr. Endean said that the octopus which had recently caused the death of a bather contained a venom believed to be related to conefish poison, which throws its victims into a helpless paralysis. It had been responsible for non-fatal poisoning of victims in Melbourne, Woollongong and Lake McQuarie, The recent Melbourne sufferer quickly became paralized after bening bitten but recovered after treatment. " A peculiarity of the Melbourne case was that the patient, though paralized was completely conscious and knew everything that had happened and what was being done to help him". Dr. Endean said " The octopus lives in shallow waters among rocks, clusters of oysters and cockles usually in estuaries and bays, but may be located on the open coast round the entire coast of Australia.

--oOo--

RAIN AND RARITIES.

Frank Climo.

On Wednesday the 2nd of January we arose (my brother and two university student friends of mine) at 1.a.m. and by 2.30. we were on our way. We travelled by car to the Anatoki River, which marks the end of the road as one travels south down the West Coast from the north of the Island. It had been pouring with rain all night, and in the uncertain light of early morning (4.a.m.) the Anatoki looked a rather formidable barrier. However, by using a long pole each (as a support on the down side of the stream) we managed to cross by wading the river where it spreads out over a shingle fan on the intertidal part of the beach. After a brief halt on th the southern side of the river (to remove gravel and sand from our boots) we again picked up our packs and resumed our walk down the coast. Low sea mist rolling in over an oily yellowish surf, at this stage, made us wonder what we had let ourselves in for. Benhamina is very common on all high intertidal rocks. The loosely arranged jelly-like egg clusters were a very common sight on each rock.

The next obstacle was the Turianawioi River. This was in high flood and gave us a few anxious moments. Halfway across the current was almost too much for us. I think you could imagine our plight when we found the water too swift to turn around and wade back again. However, we made it - just ! After a couple of hours further tramp-ing into mist along flat sand we reached the Anaweka River. Discretion being the better part of valour we decided not to cross this one, but instead, turned inland and after a short stiff climb arrived at the Anaweka Hut.

Preparation of breakfast, drying of clothes, a sleep, and unpacking occupied most of the morning. It may be worth mentioning that the hut was occupied when we arrived - an oppossum made a hurried retreat from the top bunk, and a weka ran off in another direction. Lunch finished I explored the ridges inland while my good comrades slept, and thawed out. All together again later in the afternoon we managed to get ourselves a good lump of venison.

Back at the hut again and feeling very contented we relaxed on our bunks, and discussed the morrows activities. It was decided that we should spend the day cave exploring and snail collecting. The oppossum mentioned earlier, apparently thinking the top bunk was unoccupied, made to bed down there sometime in the night, but was discouraged by a heavy whack on the head with the handle of a cut down bayonet. The fireplace had been ripped out, by the way, thus afford-ing a means of entrance (and quick exit) for the animal.

The following day found us, by mid-morning in the "canyons". This is truly a spectacular block of limestone country situated about ¾ mile inland from the Anaweka Hut. From one larger centrally situated valley, other smaller ones branch off so as to suggest a multi-toed bird's foot. The gully walls for the most part are composed of precipitous bluffs and these are in many places almost hidden by a tangle of native forest. The bluffs themselves are adorned with stalactites and other more grid-like formations of calcium carbonate. They are pitted, split by great cracks (which continue as fissures in the ground below the bases), and are undercut near their bases forming small dry pockets running back a few feet, which are rich in subfossil and bleached material. In the bleached state we collect in this type of locality.:

Maoriconcha o'connori (12 specs- 6 mm to 12 mm.)

Rhytida probably patula.

Suteria ide *Geminoropa spelaea*

Thalassohelix zelandiae

Gerontia pantherina

Fragments of a Paryphanta (Kahurangica?). Collected alive in leaf mould on top of rocky ledges were :-

Phelussa oconnori	(5 specimens)
Phelussa hypopolia	(1 spec).
Gerontia pantherina	(common)
Rhytida patula	(4 specs)
Fectola reeftonensis	common
Fectola tapirina	less common.
Subfectola caputspinulae	Uncommon.
Paralaoma sp.	common.

Further up the valley we explored a creek which flowed straight out of the cliff face. We entered a cavern (really a great split in the rock touching at the top) and followed it about 30 yards, where it ended in a sheerwalled pothole. A small waterfall ran over the lip through a worn groove and splayed over the dense mat of moss and filmy lichens which covered every inch of the walls. The floor of this hole was covered by a tangle of logs and small rocks; the logs so rotten in many cases that their centres were like yellow jelly. Whilst searching among these pulpy logs I found my first live pair of *Maoriconcha oconnori*. When found the animals were curled up in small depressions on the underside of the log, the elongated part of the foot wrapped around the wider shelled part, for all the world like a sleeping cats tail. In the same log I also found my first specimen of Peripatus - a velvety green animal, just over an inch long and not unlike a caterpillar. Large frail shelled Therasia's also seemed to like the dripping dampness of this locality. Rather regretfully we (I, at any rate) made our way back to the hut later on in the afternoon.

Back at the hut when I opened my torch (batteries can be removed leaving good carrying space for snails) I discovered both live Maoriconcha missing. I couldn't do much about it so decided to stop over again on the way back from Kahurangi Point. It does not pay to underestimate the writhing power of a Maoriconcha. They can roll at quite an amazing speed by lashing the thin elongated posterior part of their bodies.

Mid morning next day (5th Jan) saw us wading the Big River and an hour later we arrived at the Marine Department house. The rest of that day, the following two, and the morning of the next we covered the area pretty thoroughly. Finds included :-

Bush north of house	P.g.kahurangica	(scarce)
Hill ½ mile south " "	P.g.kahurangica	(abundant)
Kahurangi River	P.g.kahurangica	(abundant)

In all streams Potamopyrgus antipodum antipodum was very common.

Collected alive on reef and small beaches the following :-

Argobuccinum tumidum	uncommon - worn
Cominella maculosa	very common
Paratrophon patens	uncommon
Maurea punctulata punctulata	common
Cellana radians radians	Large specimens 51m.m57m.m.
Cellana radians perana	Large shells over 40 m.m. had a distinct yellowish colour like a pale flava inside.
Xenophalium pyrum	2 sps.broken by wave action

The masses of crab inhabited material included :-

Coluzea spiralis	small 53 m.m. protoconch slightly damaged.
Maurea tigris	2 large perfect specimens.
Maurea p.stewartiana	
Cominella nassoides	
Mayena australasia	worn.

(Since this trip my youngest brother found me a large living specimen from rocks at Patarau - 89 m.m. X 54 m.m.)

Just before lunch on the 8th. we left for home with me determined to get some live Maoriconcha at the Anaweka that afternoon. I was lucky, and found 4 living animals and one shell but I had to roll over scores of logs to get them. By 5 p.m. clouds had built up from the N.W. and the atmosphere was warm and dead still. Before we reached the Anatoki at 8 p.m. nature really gave us an on the spot display of her wilder side. A gale from the North sprang up from nowhere and with it came teeming rain and fitful thunder. With the help of a car (luckily going our way) we reached Mangarakau township at about 10 p.m.

By this time the air was calm again but a grumble of thunder could be heard in the north. As we tramped (stumbled) on 'Dry Road' around the south end of West-Haven Inlet the thunder gradually built up and the sky started to flicker. I think the storm that hit us half way up the Big Hill travelled over most of N.Z. that night. However the torrential rain did not start (although it was raining) until we fell into the Green's Point Hut, on the main road at 12.15.p.m. The lightning was an almost continuous bluish-white flash and the stunning loudness of the thunder was fantastic. Cramped bodies were reluctant to move in the morning but we summoned up enough energy to stop a passing jeep which carried us the rest of the way home.

Heat, Paryphanta superba prouseorum and the Heaphy Bluffs will always remind me of last Xmas tramp and likewise I shall associate this trip with a few things Maoriconcha; Phelussa, floods, Rain, it rained every day and thunderstorms. I'm sure it would not have been so exciting if we had had fine weather.

--oOo--

b

Our President Mr. Walker, happened to be at the right place at the right time recently. - a sizable wash up of shells at Paraparaumu - lots of Alcithoe swainsoni , Maurea cunninghami, Tanea zelandica and many others. There were so many A. swainsoni that he was throwing them away and just picking out the very best after awhile so he says. Included in these shells was a small bi-valve Notocallista multistriata , a rare shell not very often seen in the wash-ups on beaches. Also collected were some fine A. fusus fusus.

--oOo--

THE CLASSIFICATION OF THE FAMILY VOLUTIDAE.

D.F.McMichael.

Of all the families of marine gasteropods which are favourites with collectors probably none is so varied in form, nor so complex in its classification as the Volutes. There are good reasons for this, which we shall examine presently; but for this reason my comments are mostly concerning the classification at the generic level, rather than the specific (as would be the case in Cypraea or Conus for example).

The family is reasonably well defined, though it is at times difficult to differentiate the Volute from families such as Marginellidae and the Mitridae, (on shell characters at least). In fact these three groups were included by Gray in his family Volutidae, which formed the only member of the "superfamily" Rachiglossa and included as a sub-group of the Toxoglossa, but on shell characteristics the Mitres are difficult to separate from some Volutes, especially the aberrant groups Volutomitra and Microvoluta. An example of the pitfalls of shells as a guide to classification is the recent discovery by the South African Barnard, that Afrivoluta pringlei, long regarded as a Volutid, is in fact a Marginellid on the basis of its radular teeth.

The early subdivisions and classifications of the Volutes were made on the basis of various taxonomic characters, and these sometimes conflicted with one another, leading to discrepancies which seemed puzzling. J.E.Gray in 1855 classified the group on the basis of both shell and animal characters and his classification seems remarkably up to date when reexamined in the light of present knowledge.

The Adams brothers tried to use the mantle, and later the radula, while Dall (1890) used the character of the embryonic shell and protoconch. Cossmann(1899) used shell-characters, especially the columellar plaits, siphonal notch and basal fasciole.

The most significant advance in the last 20 years was the work of Pilsbry and Olssen 1954, who broke through the old classifications and completely rearranged the group in a dozen subfamilies, in each case taking into account all known characters such as radula, protoconch, shell structure, operculum, fossil history and distribution in space.

Recent unpublished studies by Clench and Turner have necessitated some rearrangement but the basic distinctions between the several groups of Atlantic Volutids have been confirmed by the anatomical structure of the proboscis. It can be anticipated that subsequent studies will confirm the distinctions of the other groups recognised by Pilsbry and Olssen though minor rearrangements may be needed.

I propose to run through the various subfamilies and show pictures of the characteristic genera, with the emphasis on the Australian forms with which I am most familiar and with illustrations of a number of rare or newly discovered species which may be of some interest to you.

Subfamily Zidoninae
= adelomeloninae

This subfamily includes the genera Zidona and Adelomelon from South America. When Pilsbry and Olssen got dealing with these groups their radular slides mixed up and so some rearrangement is necessary. The subfamily as reorganised by Clench and Turner will include Adelomelon Dall, and Zidona Adams, Janithoe Pilsbry and Olssen, and Pachycymbiola, all from South America, plus the deepwater form from pff the Pacific coast of North America, Arctomelon.

The protoconch is simple, except in Zidona, where there is secondary development of a long spinous growth. Radula teeth are simple and tricuspid.

Subfamily Odontocymbiolinae

The inadequacy of shell characters is amply demonstrated by the convergence between Adelomelon ancilla and what has been known as A.magellanica. The latter proves to have quite= a different structure from A.ancilla and has been named Odontocymbiola AND REPRESENTING a distinct subfamily with the high curved fanglike cusps on a flattened basal plate.

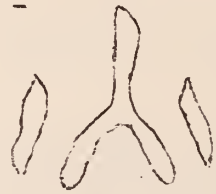
Another recent genus belonging to this subfamily is Miomelon, based on a deepwater shell from South American waters, and Dr. Powell has described a species from off New Zealand, Miomelon scoresbyana .

Subfamily Volutoderminae

Entirely fossil and containing a number of interesting groups but with no clear affinity with any recent species

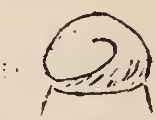
Subfamily Volutomitrinae

This group of curiously small mitra-like shells seems to form a link with the family Mitridae. The radula is triserial with a Y-shaped central tooth and small triangular labras.



We now come to four sub-families which contain the majority of the interesting Volutidae. These are the Fulgorariinae, Cymbiinae, Alcithoinae and Scaphellinae.

The Fulgorariinae contains a series of genera with a characteristically asymetrical or inclined protoconch - radula typically tricuspid. The Japanese Fulgoraria typifies this family but it also includes many of the larger Australian genera, such as Livonia (= Pterospire & Mamillana) Ericusa, Mesericusa, Festilyria (S.Africa) Cottonia and Callipara.



Pilsbry and Olsson included Iredalina in the subfamily but I regard this as belonging more with the Alcithoe.

Subfamily Cymbriinae

This group includes the Australian species with the regularly coiled protoconchs and large body whorls - including the Balers and their relatives, and as a sub-group Cymbiidae, the African Cymbiums with a calloused protoconch immersed in the spine. The radula is uniserial, with typical tricuspid teeth of a very large size.

Genera include Cymbium from Africa

Meloides

Melo, Melocorona, Aulica, Aulicina, Cymbiolacca, Cymbiola, Volutoconus, Cymbiolena, Volutocorona - all the well known forms.

Subfamily Alcithoiinae

These are subfusiform shells with usually a "Scaphelloid" protoconch - this is one with a few loosely coiled whorls, with a large initial turn, a flattened summit and a central calcarella. Radula unistriate and typically tricuspid. Volutoconus may belong here.

Typically these are New Zealand forms and genera include Alcithoe,
Pachymelon (Palomelon)
Leporemax (= carolluta) and
Teremelon.

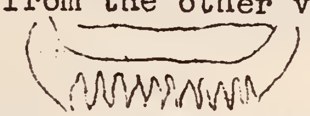
Probably the genera Guivillea and Provocator should be placed here.

Pilsbry and Olsson included the Ceylonese-Indian shells classified as Harpulina - lapponica (= interpureta) and arausaica (= vexillum). but on geographic grounds and on the basis of the protoconch they probably belong elsewhere and perhaps with the Cymbiinae.

Subfamily Volutinae

This contains only the recent genus Voluta which has three species on the Atlantic - ranging from the Carribean area to the tropical Mediterranean -African Coast, plus some fossil groups.

The radula tooth structure of this species is quite different from the other volutids -



coupled with its high, several coiled, pupiform apex, and atlantic distribution, this sets the genus off from all other living forms and hence it is really quite wrong to use Voluta as a generic name for any other species. This is quite a contrast to the situation in Cypraea, Conus or Strombus for example where the overall genus is not significantly different from any of the more restricted generic subdivisions.

Subfamily Volutilithinae

Contains only fossil genera especially Volutilithes.

Subfamily Athletinae

This is regarded as the most primitive of the living groups and contains two deepwater genera - Volutocorbis from Africa and Ternivoluta from East of Cape Moreton, Australia. Both have been found in fair numbers in recent years. They have a triserial radula in which the marginals are still retained.

The protoconch is rather simple and not of any great size. There is no operculum.

There are many fossil genera especially in America which are regarded as belonging here.

Subfamily Lyriinae

These small volutids represent another primative group which, though having the uniserial radula typical of the majority of the volutes still retain an operculum. There are several living genera, especially Lyria, Lyreneta, Harpella, Enaeta, and numbrous fossil forms, mostly falling into Lyria and Enaeta ss.

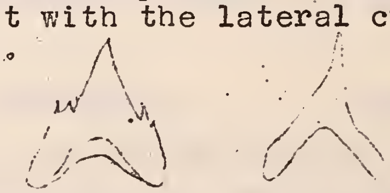
The genus Lyria contains some spectacular shells, especially L. lyraeformis and L. cloveriana. The Australian Lyrias include some not uncommon species while Lyreneta laseroni is a curiously shaped and rare shell found on beaches of north N.S.W. which has been collected intertidally. Enaeta are restricted to Atlantic where there is also one Lyria ss. (I propose to depart from Pilsbry and Olsson's sequence to deal with a few smaller groups. In any case the sequence is of little importance).

Subfamily Calliotectinae

This interesting group contains a number of apparently primitive deepwater forms - which possess long slender shells, a uniserial radula with typically tricuspid teeth, and a well developed corneous operculum. Mostly with axial sculpture - Some rare forms here - Calliotectum, Teremachia (= Howellia & Prodallia) Phenacoptygina, Neptuneopsis and Fusivoluta.

Subfamily Scaphellinae

This includes the species in which the radula is Y shaped - in fact with the lateral cusps reduced or completely absent.



There are three centres of distribution of the family represented by three tribes, Amorides, Halides and Scaphellides. First is Australian and includes the genus Amoria & Zebramoria, one of the most spectacular groups of shells, plus related genera such as Paramoria, Nannamoria. However the latter may not belong here but may be grouped with a number of other Australian genera with simple protoconchs such as Notovoluta, Pseudocymbiola.

Pilsbry and Olsson place the New Zealand genus Parvimitra with Amoria

The tribe Scaphellides includes the American representatives of the subfamily - genera included are Scaphella, Aurinia, Volutifusus, Clenchina and Bathyaurinia.

Some of these groups are now regarded as subgenera but for collectors, most are lumped as Scaphella or Aurinia and include many rare forms as well as sought aft after spotted species S. junonia.

The tribe Halides includes only one genus - the Western Mediterranean Halia, with only a single species Halia priamus, single turbinate protoconch and radula teeth with short mesocane.

Evolution of the Volutidae is obscure. The species found in the Eocene and Oligocene of Europe seem quite distinct from the bulk of recent forms.

In the Australian Tertiary a number of groups are represented from Miocene onwards, but most groups have no known fossil ancestry. The recent Indo-Pacific forms, including the dominant Cymbiinae, Amorides seem to have no close relationship with any of the earlier fossil groups and the radiation of the family remains obscure.

However it seems certain that the general picture is one of a whole series of groups on the verge of extinction with numerous small subfamilies containing lots of Monolypic genera which are just hanging on. Only a few active groups are strongly evolving today - Amoria, Cymbiinae, Fulgoria, Scaphella and Alcithoe.

--oOo--

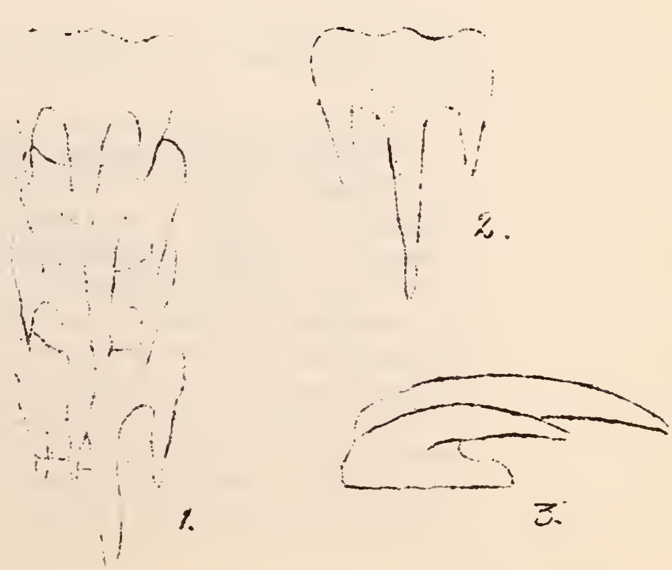
Radula of Volutoconus grossi. Iredale.

1. Odontophore, showing alternating teeth.

2. Rachidian tooth

3. Side view of No.2.

--oOo--



NEW PUBLICATIONS.

From Dr. Dell was have had separates of several of his recently published papers dealing with our Molluscan Fauna. For your information they are listed here with his brief abstract of the contents.

The Molluscan Genus Ranella and the Distribution of Ranella olearium (Linnaeus)

R.K.Dell & S.P.Dance.

Proc.Mal.Soc.London. Vol.35. Part 4. December 1962.

Various generic and specific names have been used for the widely distributed large species recorded in the literature as Ranella gigantea, . Cyrina gigantea.Ranella multinodosa and many other names have been proposed for supposed Recent and Tertiary varieties. Dance,1959, Dance & Dell, 1960, and Barnard, 1963, have recently used the name Cyrina gigantea (Lamarck) for this species, recording it from a wide range of localities including British Isles, Mediterranean, West Africa, South Africa and New Zealand.

"Additional Archibenthal Mollusca" from N.Z.

R.K.Dell .

Rec.Dom.Mus. Vol.4. No.6. Pages 67-76 .1962

" Since the writer gave an account of the Archibenthal Mollusca of N.Z. (Dell, 1956) Mollusca have been obtained from five Dom.Mus.Stations in depths hreater than 100 fths., and from eight Stations established by Zoology Department, Victoria University, Wellington. A number of new sps. have been sorted out from these stations and seven are described here . Four of the Stations are from the Bay of Plenty while others are from Cook Strait, and off Otago. Because they supply additional data on distribution and Bathymetric range all benthis mollusca obtained from these stations and identified to date have been listed.

The Littoral Marine Mollusca from the Snares Is.

R.K.Dell.

Rec.Dom.Mus. Vol.4. Part 15. Pages 224-229,1963.

"During January and February 1961, a party from the Zoology Department, University of Canterbury carried out a biological Survey of the Snares Is. Professor C.A.Knox forwarded the mollusca obtained to the writer for identification. Since there are a number of new records for the area, and some points of nomenclature required discussion, it seems worthwhile publishing a list of material collected.

Mollusca have been previously collected from the Snares on several occasions by Capt.J.Bollons during official visits by N.Z.G.S.Stella and N.Z.G.S. Hinemoa, and by naturalists associated with these vessels. Most of this material was recorded by Suter,(1913). In addition, during the expedition to the Snares during November 1947, Dr. C.A.Fleming collected mollusca.---"

Notes on Some N.Z.Mollusca in the British Museum.

R.K.Dell.

Trans.Roy.Soc.N.Z.Zoo. Vol 3. No.17. 1963.

" As a result of the examination of Molluscan types in the British Museum (Natural History) notes and figures are given here for the types of species of Pectunculina,
Chlamys,
Kellia

Tellinella, Myadora, Micrelenchus, Eriginatica, Pluerotoma, Paracomitas, Antimelatoma, Aoteadrillia, and Asperdaphne."

Archibenthal Mollusca from Northern N.Z.

R.K.Dell.

Trans.Roy.Soc.N.Z.Zoo. Vol.3. No.20. 1963.

" New species of Marine Mollusca and extension of ranges of Archibenthal mollusca are recorded from stations in northern N.Z. established by the Marine Dept. Prawn Trawling Survey in 1962.

New species of Pholadomya, Aeneator (Ellicea) Columbarium, Pachymelon (Palomelon)? Waitara being the first recent records of these genera from N.Z. waters. The probable wide distribution of the archibenthal mollusca is discussed."

The Mollusca of the genus Argobuccinum (Family Cymatiidae)

R.K.Dell.

Trans.Roy.Soc.N.Z. Vol.3. No.21. 1963.

" The forms of Argobuccinum are reviewed, and arranged in the following systematic framework.

Argobuccinum argus from southern S.Africa.

A. ranelliformis ranelliformis from South America.
A ranelliformis tumidum from N.Z.& South Australia.
A. proditor from St. Paul and Amsterdam and a new subspecies from Tristan de Cunha and Gough Islands. The two South American species rude and scabrum are grouped in Priene as a subgenus of Argobuccinum. The distribution of the group and possible fossil ancestors from N.Z. are discussed."

Journal of the Mal.Soc. of Australia

No.7. Dec. 1963.

Probably the papers of greatest interest to us are those dealing with volutes.

These are :-

Re-description of *Amoria dampierana*

by Clifton Weaver.

A new species of *Lyria* from Ceylon.

by Clifton Weaver.

Descriptions of 2 new species of the genus Cymbiolacca

by Donald F. McMichael.

This publication is in the Section's Library.

--oOo--

PRESERVING SEA URCHINS

Norman Douglas.

To those people with a passing interest in taxidermy the first experience of mounting the common sea urchin (Evechinus chloroticus) is usually one of disappointment. Whereas in life this animal appears bright, with spines buoyantly erect, in the mounted form, with spines lying down, it appears altogether depressed and forlorn.

In fact we find that as soon as the urchin is removed from its salt water home it immediately lowers its spines and we cannot stand them up again without breakage, - quite a little problem for a clumsy man !

The writer is indebted to Mr. H.J.Chapman for the suggestion involving the use of sand which paved the way to success. The method is as follows :- The apparatus required to be taken to the sea-side is very simple. It consists of one bucket, a circular piece of cloth abouth 18" across, apiece of string about 24" long and a packing needle.

Having found a suitable specimen, it is placed in the bucket of seawater and carried to the beach where the sand is fairly coarse and wet. Now for some quick action ! Lift the urchin out of the water and place it on the beach withs its mouth down in its usual living position. With the hands, quickly scoop up sand from around about and plaster it all over the urchin. This must be done quickly before it has time to depress its spines. Pad it all over with sand, completely covering all the spines, thus preventing them from being lowered. Next pick up the cloth and spread this on top of the sand mound for that is all we can see now, using the cloth to hold the sand in place, and flip the lot over so that the urchin's mouth faces the sky. At this juncture more sand will be required which is padded on around about the urchin's mouth, which area could not be reached before. Having done this, draw up the cloth all around, and with the needle and string, make a drawstring to hold the whole in place. The job now looks very like a Christmas pudding in its boiling cloth, except that a space is allowed in the opening part of the drawstring a little more than equal to the full width of the sea urchin's mouth. In this condition the specimen can be taken home.

As soon as convenient take a scalpel knife, cut around the jaws of the sea urchin and with the aid of a pair of forceps (a doctor's artery forceps make an ideal tool) remove the "Aristotle's lantern". With a hose of water, a piece of wire curved to form an open hook (for a long-handled scraper) and the forceps, remove all the internal organs of the shell.

The shell is now clean on the inside and the spines held in their natural erect position by the sand and cloth on the outside. Fill the inside of the shell with 20% formalin and water solution and let it stand at least overnight, or longer, in a place where a steady but slight leakage will cause no harm.

The urchin is now preserved with its spines erect in their natural life-like position and all one has left to do is to remove the cloth, hose off all the sand from the spines and dry the specimen in a shady place.

It will be found, however, that the standard of the finished job is very closely associated with this final cleaning rpocess. A water hose seems to remove the sand best, but assistance can be given in places with a soft haired clean paint brush.

As with cleaning hair, and shells of some sorts also, the richest looking polish is best obtained by rubbing the surface dry. Allow to dry without rubbing and it drys with a dull finish; rub dry and we obtain a polish. A sea urchin's spines provide a problem here again. We certainly cannot rub them dry with a rag. Neither can we successfully use the saw-dust method of cleaning hair. However a careful brushing with a dry soft-haired paint brush when the spines are almost dry will be found to help a lot.

So now for a sea urchin which has grown to a full six inches across!

The poor little urchin!

--oOo--

BOOKS ON SEASHORE LIFE.

For Children :-

Down to the Sea — L.R.Brightwell
Pitman 1954.

Seashores — H.S.Zim & L.Ingle
Simon & Schuster, 1955

The Rock Pool — A. Torrie
N.Z.Dept. Education 1960

--oOo--

Australian Books :-

Exploring between tidemarks.
E.C.Pope & P.M.McDonald
Aust. Museum. Sydney.

for beginners' -

Australian Sea Shells — J.Child
Periwinkle Press 1961

Common Shells of the Aust.Seashore
D.McMichael
Jacaranda Press, 1961

OVERSEAS BOOKS.:-

The Edge of the Sea — R.Carson.
Staples, 1955.

The Underwater Guide to Marine Life
C.Ray & E. Ciampi. Nicholas Kaye 1958

Between the Tides — Univ. of London Press
P.Street 1952

Natural History of Marine Animals
G.E. & N.McGinitie McGraw-Hill 1949

Animals without backbones. Pelican, 1951
R. Buchsbaum.

Life of the Shore & Shallow Sea.
D.P.Wilson. Nicholson & Wilson
1951

--oOo--

Vol.2. Part 2. June 1964.

LIMPETS.

W.E.Ponder.

The name 'limpet' is applied to many very different gastropods and even to some molluscs from different classes, for example, the recently discovered Aplacophoran Neopilina.

A shape rather than a taxonomic entity, "limpet" can be likened to "worm" a name which is used to cover animals from several phyla, including some molluscs.

All of the major groups of gastropodss have produced limpets, in other words, some members have lost their spiral shell and become bilaterally symetrical. Since the limpet shell has evolved so many times it is presumably advantageous in at least some circumstances.

Typical limpets living on the shore, can cling tightly to the rock surface, their low shell offering little resistance to the onslaught of waves, whereas normal snails would possibly be washed away. Some limpets live in places where there is little or no force from waves and have lost the coiled shell for other reasons. An animal with a limpet shaped shell can move about more easily under stones and if this shell is embedded in the back of a slug, it offers little or no resistance to the animal forcing its way through narrow crevices. Thus greater mobility and compressability is obtained by shell reduction to a simple limpet shape. Sedentary animals feeding by filtering out the minute particles from the water (filter or ciliary feeding) often develop limpet-like shells if they live on a hard substratum (e.g. Calyptraecea). Struthiolaria, a filter feeder burrowing in sand, has re tained a coiled shell and actgive locomotion because frequent dislodging is possible in soft waveswept substrata.

Some deep water groups (e.g.Capulus) are in the habit of clinging to shells and, by developing a wide attachment base, become more secure.

To understand the classification of limpets we will briefly examine the classification of the Gastropoda,. The gastropods can be divided into three main groups or subclasses, the Prosobranchia, Opisthobranchia & Pulmonata. The differences between these groups and the story of evolution within them can best be seen by looking at their mentle cavities - the sac-like space above and around the head, and into which the head retracts.

It contains the gills, anus and kidney openings. Because of a process known as "torsion' during development, the gastropod mantle cavity usually faces anteriorly. This means that an undisturbed water stream can enter the cavity but it brings with it problems of sanitation.

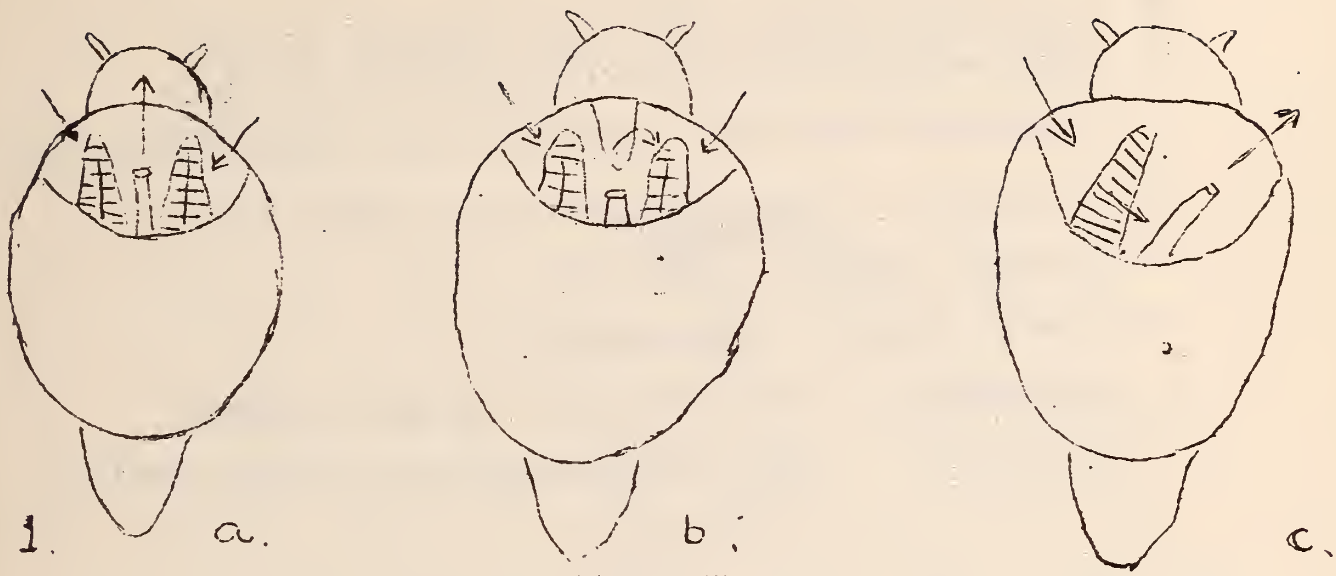
The Prosobranchia retain the forward facing mantle cavity, and putting it to the best possible advantage, in the more highly evolved groups, as a sort of smelling device with a long movable snout or syphon in front, with which they hunt their prey. Some have used the gill in the mantle cavity for collecting food, and have taken up a sedentary existence. (e.g. the Calypts.

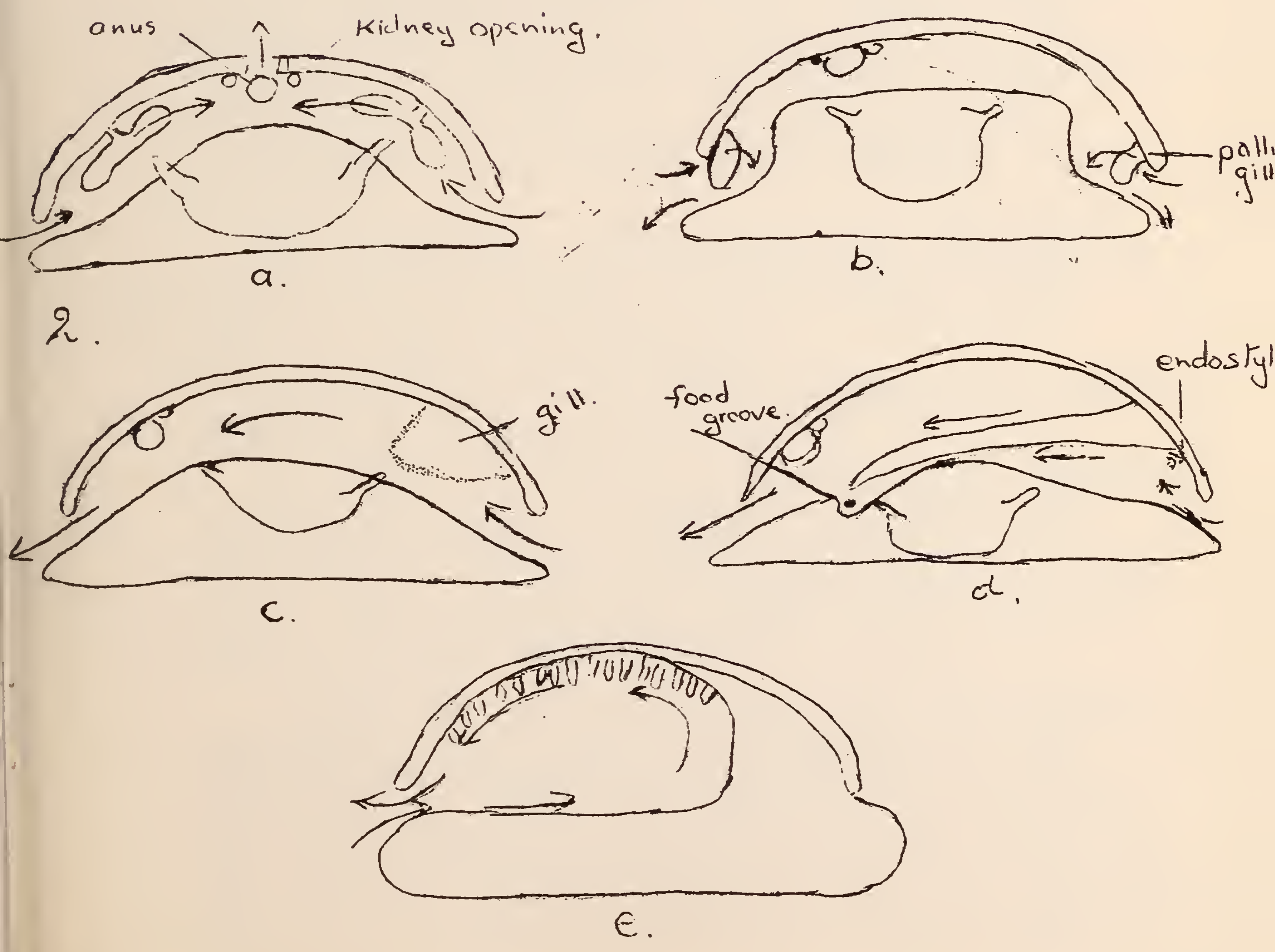
The Opisthobranchia show an increasing tendency to reverse the effects of torsion and the mantle cavity has gradually passed down the right side during their evolution, culminating finally in the nudibranchs with no mantle cavity, and the anus at the posterior end on the mid-dorsal line.

The Pulmonata have put the mantle cavity to another use - breathing air. This lung has a small opening on the right side which can be closed by muscles. The anus and kidney open directly to the outside.

Let us now look at the limpets within these groups. One of the most primitive, prosobranch families in the Fissurellidae. They are usually limpet-like though this is always secondary, the most primitive gastropods having a spiral shell. Typical fissurellids such as Tugali, Emarginula and Scutus are all fairly large animals living low on the shore where they are in no danger of desiccation. Emarginula has a slit in the shell, Tugali and Scutus also have a slit but this is in the mantle, the shell being nearly entire.

The Keyhole limpets have a hole near the apex of the shell that serves the same purpose as the slit of Emarginula. These primitive gastropods have two gills with the anus lying between them (Fig.16) Since water must enter the mantle cavity anteriorly it would also have to leave anteriorly if there were no other opening. Excretory matter would mix with the inhalent stream and foul the gills. (fig. 1ₙ) One solution is to make an exit for the exhalent current in the roof of the mantle cavity just in front of the anus (fig.16). This arrangement is a disadvantage as the animal can never be effectively sealed from the weather or enemies. Other gastropods lost the right gill and thus a left to right


1.
a.
b.
c.


anus
Kidney opening.
palli
gill
a.
b.
2.
gill.
food
groove.
endostyl
c.
d.
e.

FIGURES.

1.
1A Hypothetical early gastropod mantle cavity.
1b Fissurellid mantle cavity with exhalent opening.
1c later gastropod mantle cavity with only one gill.

2. Diagramatic transverse sections of the mantle cavities of :-

2a Fissurellid - Note the gills have a double row of filaments.
2b Patellid limpet (Cellana).

2c Acmaeid limpet (Notoacmaea).

2d Maoricrypta Note the very long gill filament

2e Siphonaria Note the secondary gills on the mantle roof.

---oOo---

stream of water became possible (Fig.1C).

Fissurellids scrape sponges with their broad rhipidoglossan radulae. They are thus grazing carnivores, living a lazy life in permanently damp conditions.

The true limpets (super family Patellacea) often found high on the shore, scrape diatons and small algae from rocks. Their radula is long and narrow with large powerful teeth and their intestine is very long for storing faeces between tides. The mantle cavity is only a small space into which the head retracts. There are two important families of limpets,. The Acmaeidae (e.g. Notoacmea) and and Patelloida have a small gill within the mantle cavity (fig.3C.) The Patellidae (e.g.Cellana) have, in most genera, lost the original gill and developed a series of secondary gills (pallial gills) around the margin of the foot (fig.3A) Ciliary currents running around the foot remove faeces in both families. The multiple gills of Cellana seem to be very efficient for limpet shapes, chitons too, having multiplied their gills. A small deep water family of limpets also belonging to the Patellacea is the Leptidae (e.g. Notocrater & Maoricrater.) They are small, blind and have no gills.

The Cacculinacea, a poorly known superfamily found in deep water, have a similar shell to the Lepetids, but have a single gill extending along the right pallial groove. They also have a copulating organ of which there is no sign in the Patellacea.

The super family Calyptraeacea consists of the families Hipponicidae, Capulidae and Calyptraeidae.

These animals also have a copulatory organ, internal fertilization allowing egg capsules to be formed within the oviduct of the female. Hipponix is cemented to the substratum by a calacreous plate secreted by the delicate foot. Thus, the shell superficially resembles an oyster. It has a long proboscis which sweeps over the substratum picking up nearby detritus on which it feeds.

Capulus has a fairly large gill and filter-feeds. Modifications characteristic of filter-feeding gastropods are much more pronounced in the Calyptraeidae (e.g. Maoricrypta). The gill is extremely large, extending over much of the greatly enlarged mantle cavity (Fig.4) It is modified for collecting food in having a very long gill filaments and the normal gill-cleaning currents put to a new use. Mucus is secreted by a glandular "endostyle" spread over the gill and suspended material is caught in these mucus sheets which are carried continuously to a food groove. There it is rolled into a string and sent to a spot just by the mouth whence it is licked up by a short proboscis (figs 2D & 4).

The Calyptraeacea are protandrous hermaphrodites, that is, they change from male to female as they grow. Chains of individuals can be found, the youngest and smallest being being male, the oldest and largest female, and those in between hemaphrodite (fig.6.A.B.C.)

Thyca a degenerate capulid, is an ectoparisite living on echinoderms. It uses its large proboscis to penetrate the host's tissues (fig.5).

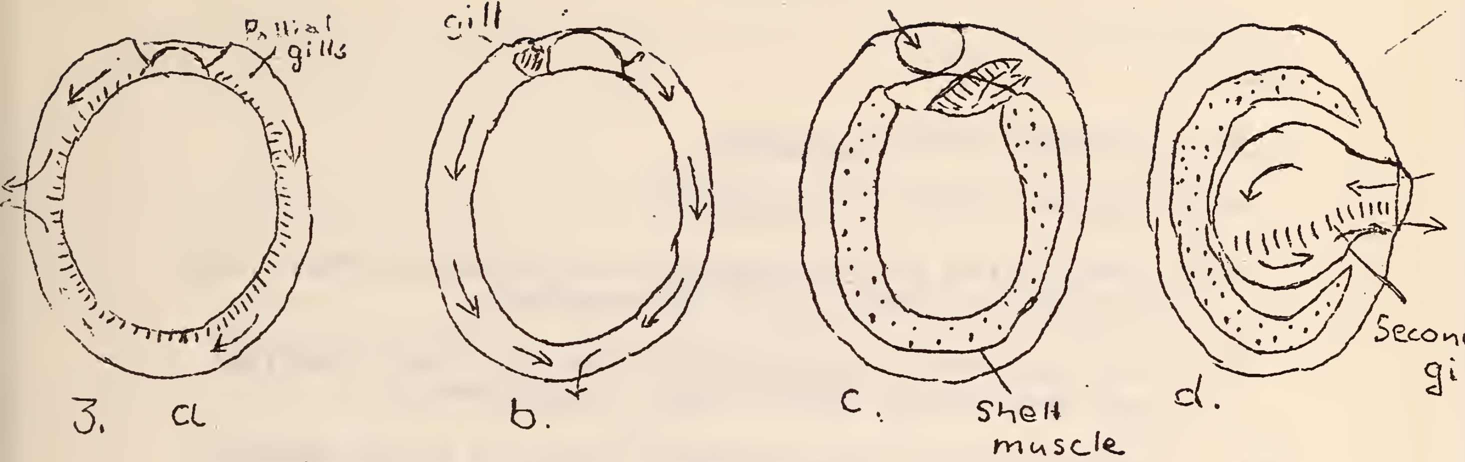
The Opisthobranchia have only one family with limpet-like shells, the Umbranculidae belonging to the same group as do the colourful Pleurobranchs.

A few Opisthobranchs have internal shells that are limpet - like in shape but most have lost their shells and acquired a secondary bilateral symmetry. The small intertidal Onchidella is a small slug with a limpet-shaped body. It has partly overcome the problem of desiccation with its tough integumrnt impregnated with special glands.

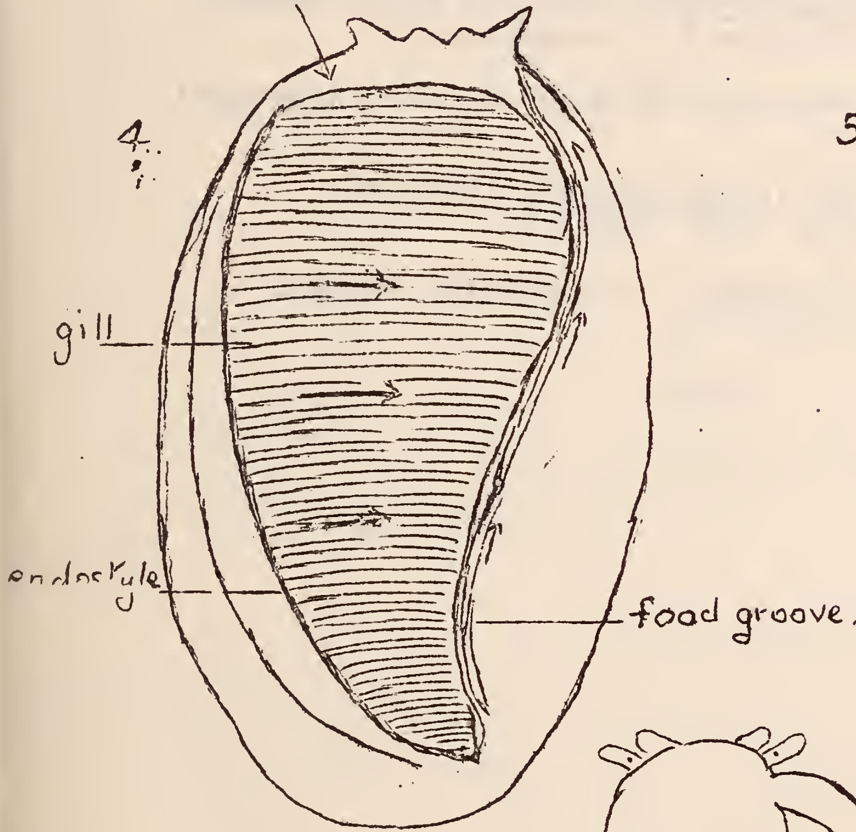
The Pulmonata contains most of the land snails and many fresh-water snails. There is also a small marine group. The Syphonariidae and Trimusculidae (e/g. Gadinalea) both resemble typical limpets closely in shell shape, feeding habits and ability to withstand desiccation.

Siphonaria is intertidal, crawling rapidly over rocks with the edges of the foot projecting round the shell as a bulbous ridge which contains poison glands. There is no pallial groove, but instead, a large mantle cavity on the right side which contains secondary gills, developed on its roof (figs.2C & 3D). These are not ciliated, the water current being produced by a ciliated strip on the floor of the mantle cavity. The redevelopment of gills has allowed this family to become, once again, fully aquatic. Gadinalea has no secondary gills and must remain near high tide mark. The animals react to light and gravity, tending to concentrate on the roof of crevices and caves where they avoid undue desiccation.

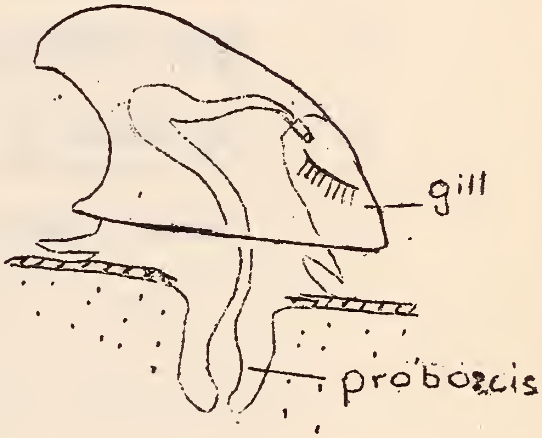
There are two families of freshwater limpets in New Zealand. The Latiidae is endemic and differs from all other freshwater limpets in having its pulmonary apertures on the right side. The Ancylidae is world-wide. They both scrape algae from the surface of stones. Like the marine Siphonaria they have developed secondary gills for respiration but these are of a different type. A flap of tissue called a pseudobranch or false gill projects from the mantle cavity.


Pallial gills
gill
Second gill
shell muscle
a
b.
c.
d.

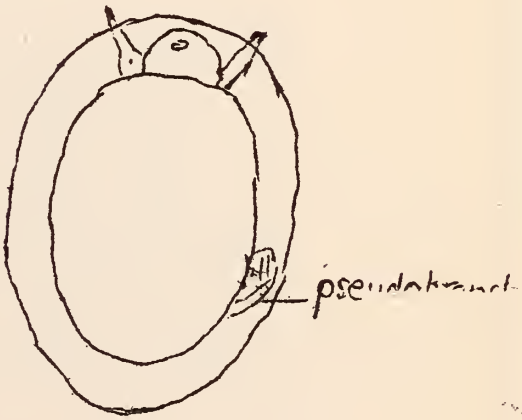
3.


gill
endostyle
food groove.

4.


gill
proboscis

5.


pseudobranch

7.


a.
b
c.

6.

<u>FIGURES</u>

3.

3a Ventral view of <u>Cellana</u>

3b Ventral view of <u>Notoacmaea</u>

3c Dorsal view of <u>Notoacmaea</u> with shell removed, and the mantle cavity roof transparent.

3d Dorsal view of <u>Siphonaria</u> with the shell removed and the mantle cavity roof transparent.

4. Dorsal view of <u>Maoricrypta</u> with the shell removed and the cavity roof as if transparent.

5. <u>Thyca</u> showing proboscis embedded in the integument of an echinoderm

6. The change of sex in <u>Maoricrypta</u> (a) male, (b) hermaphrodite, (c) female.

7. Ventral view of <u>Ancylus</u>, a freshwater limpet.

--oOo--

In some species it becomes much folded thus increasing the respiratory surface.(Fig.7). Latia is interesting in being phosphorescent.

There are no real terrestrial limpets, although some slugs have a flattened, reduced shell on their back, e.g. the N.Z. Schizoglossa being an example.

In this brief discussion we have seen that the story of the molluscs only begins with the shell a fact most obvious in the limpets. where a similar shell may cover animals of a very different organisation and belonging to any one of the major groups of the gastropoda.

--oOo--

The N.Z.Shells in the Collection of Joseph Banks.

"The three voyages of Captain Cook opened up vast coastlines hitherto known only vaguely as Terra Australis incognita, from which plants and animals were brought back in almost too great a profusion to be dealt with by the few naturalists of the day who were capable of the task. One of the most able amongst these was Daniel Solander who accompanied Joseph Banks on Cook's momentous first voyage round the world 1768-1771. "

" These two were keen and naturalists, Solander the elder by a few years, still imbued with the teaching of Linne. Banks, wealthy, with his appetite for travel sharpened by a recent voyage to New Foundland were just in the mood to join the expedition being prepared to observe the transit of Venus from Tahiti, 1769. Permission to join the vessel was obtained with the aid of an influential friend, but the expense of collecting equipment, staff of artists, servants etc. were paid by Banks himself, himself at a cost of some five or ten thousand pounds."

" ------ there is little of note regarding shells in Bank's Journal during the circumnavigation of N.Z. Oct.8th - March 31st 1770., but there are one or two references to the mollusca as a welcome source of extra food; accordingly on the 20th Nov. a meal of boiled shags was followed by one of a different kind supplied to Banks and his party at a small village in Mercury Bay where they were "most civally received by the inhabitants who treated us with hot cockles or at least a small flat shellfish, (Tellina) which was most delicious food. "

This was probably Amphidesma ventricosum Grey, the Toheroa of N.Z. said by Suter (1913) to be particularly plentiful on the northern shores, especially the West Coast and is still considered a great delicacy. The next day an oyster bank was found and the 'Endeavour's' long boat was filled with " as good oysters as ever came from Colchester, and of about the same size. The ship's company, I sincerely believe, did nothing but eat from the time they came on board, till night." These were without doubt the famous Auckland rock oyster Ostrea glomerata Gould, common to the Hauraki Gulf and still consumed in quantity from May to September.

From Banks concluding remarks on N.Z. (Journal page 227) where he notes a plentiful supply of oysters, clams, cockles and many other sorts of shell fish etc., one would have expected rather more than the eight typical N.Z. shells found in his collection and listed below, but again it is evident that Botany was his main pursuit, molluscs being attractive mainly as a source of extra food.

* Notirus reflexus Grey	-	Venus Nova Cambria (in error ?)
* Aulacomya maoriana Iredale = magellanicus Auct	-	Mytilus Novae Zelandiae N.Z.J.B., D.S.
* Mytilus canaliculus Martyn		—"— N.Z.
* Musculus impactus (Herman)		Mytilus gibbus N.Z. Sol.MSS
* Chione stutchburii (Wood)		Venus antiquata Sol. MSS, Nova Cambria (in error ?) J.B.
* Struthiolaria papulosa (Martyn)	-	Murex
* Buccinulum multilineum Powell	-	Murex N.Z.
* Cymatium parthenopeus (von Salis)	-	Murex olearium.

The above, quoted from "A Catalogue and Historical account of the Banks' Shell Collection," by the late Guy L.Wilkins, Bulletin of the Brit.Museum. Vol.1. No.3. will give you some idea of what these first naturalists to visit this country overlooked in the way of shells.

--oOo--

ITEMS OF INTEREST.

Goat Island in the Leigh area has recently yielded several Charonia capax and at our last meeting John Laxton had a beautifully coloured example of C. rubicunda from this locality. Anyone feeling like a swim ?

--oOo--

Some particularly fine large specimens of Cardita brookesi, Finlay, were collected by Mrs Edwards at Matheson's Bay, Near Leigh. She tells us that they were quite plentiful at this locality.

--oOo--

A sample of sticky ooze dredged by a local fisherman from 40 fathoms off Piha, Auckland West Coast, yielded after being put through a set of sieves, some interesting small mollusca, plus quite a collection of actocods, Radiolarians and Forams.

Here is a list of the mollusca present :-

Lissotesta errata	Powell.	Brookula contigua	Powell
Poroleda lanceolata	(Hutton)	Nucula strangei	(A.Adams)
Bathyarca cybaea	(Hedley)	Syrnola menda	Finlay
Cadulus delicatula	Suter	Odostomia sp	
Dentalium nanum	(Hutton)		

The material is in the Turner collection.

--oOo--

Mrs Haywood, Masterton, has recently located Buccinulum colensoi at Castlepoint, fine specimens too, having a taller spire than those from the vicinity of Gisborne.

From Castlepoint sand dunes we can record a further occurence of an introduced snail Hellicella caperata.

On a rcent hunt at Waikanae Beach on the Manawatu Coast, Mrs Hayward picked up a pair of fine Aeneator O. cookianus. This sub species is not often cast up Miss B. Elliot of Takaka has had several from Pakawau near Farewell Spit, South Island.

Also from Mrs Haywood ' There was a 7" nautilus picked up at Castlepoint last week. Unfortunately the finder was not me.

--oOo--

Have those of you who have done some collecting at Whangarei Heads, noticed the extremely large fine specimens of Lepsiella scobina on the inter-tidal rocks ? I secured some which were around the $1\frac{1}{2}$" mark and strongly ribbed. Dr. Powell says that he thinks Onerahi specimens are even better.

--oOo--

Mrs Waldronof Whangarei has found a specimen of the very rare Nassarius particeps, known from N.Z. by only two or three examples. Although not in perfect condition the spiral lines are plainly visible. This shell differs from N.spiritus at a glance by the different colour pattern consisting of five or six spiral lines running round the body whorl. These are not present in N. spiritus.

--oOo--

A shell which can be collected locally but one which is apparently passed over, for it is not often seen in collections, is Dosinula crebra.(Hutton) This shell has been put on and off molluscan lists in the past.

Probably most collectors would consider the shell to be just a small rounded Dosinula zelandiae (Gray), the heavy, elongate shell with strong concentric ribs. Certainly it lives in similar situations but can be recognized by its rounded outline, light brown colour, streaks and blotches near the hinge regions, and the ribbing which is perhaps somewhat less prominent. It occurs at Takapuna at times but seems to be more prevalent in the Manakau Har. Specimens no doubt occur on other beaches in the general area

--oOo--

Mrs St. John of Nelson writes " My husband was fishing and caught blue cod, and in the stomach of one he found a beautiful specimen of Ellatrivia memorata. The fish was caught in Greville Harbour area of D'Urville Is. I have not heard of Ellatrivia being found in this area of N.Z. before, but maybe they have ? We have been fishing here and at French Pass many times a and can always get Chlamys zelandiae, Pallium convexum Limatula maoria and small Haliotis from the cod stomachs, but have never found or even heard of an Ellatrivia before. Maybe they have come South and we may be lucky another time. " Have any of our members managed to collect an Ellatrivia from this locality ? It would be interesting to know just how far South these shells have been found. How about members telling us the farthest south they have collected this species ?

FIELD DAY on MARCH 4TH.

Maori Bay, Muriwai recently saw an invasion by the Section's 'bucket brigade.' About 20 members turned up to see what this rocky coastline had to offer. It was a pleasant, fine day with scarcely any wind. The tide was not particularly low but enthusiasts certainly made the most of the area that was available.

Some rather hard labour was put in by those hankering after the fine large Zediloma digna. Large smooth boulders near high tide mark were turned over to reveal colonies of these blue-black Trochoids. Sharing the same habitat were quite a lot of very nice Marinula filholi - normally pink but here, albino in quite a number of specimens.

Some large clean Zediloma arida were taken in the same area.

Paddling in rock pools in search of discriminating hermit crabs was quite profitable. This type of collecting netted participants about 18 specimens of the rare ? Cominella euthriaformis. This small attractive shell is more slender than C. quoyana without the axial ribs, and covered with brown spots, Most of the known specimens have been taken at this locality.

The younger members of the party seemed to be here, there and everywhere - they located some very fine large Eudoxochiton nobilis and Guildingia obtecta. Numbers of Cavodiloma coracina with the distinctive concave whitish base, were seen around the edges of rocky outcrops surrounded by pools in the sand about half tide mark. A number were added to various buckets.

While some good examples of the bluish-white Buccinulum motutaraense were found, this species does not seem to be as common as it was some years ago. These were uncovered from beneath the Codium seaweed on rock faces, again at about half tide.

Only one specimen of the banded Buccinulum vittatum was reported but ordinary B. heteromorphum was not uncommon.

An enormous boulder with a dark 'cave' underneath was found to be the home of the white tent-like Gadinalea nivea. Here, they were on the roof of the 'cave' clustered tightly together - at times so crowded as to be one on top of the other. These molluscs always seem to choose this type of home. Unfortunately the appearance of West Coast specimens is usually usually marred by grains of black sand which has become cemented onto the inside of the shells.

As a rule, there are large numbers of small Xenophalium pyrum in the rock pools (hermit crabs) but on this occasion they were scarce.

Paratrophon cheesmani seemed to be as prolofic as usual.

On the way back along the beach, at the water's edge, several members gathered up some storm shells - Janthina violacea, which had just been washed in, together with the inevitable Spirula spirula.

Editor.

AUSTRALIAN LETTER.

Our Northland member who is still actively hunting material in Australia writes :-

" Left Renmark S.A. on 17th March and spent a couple of days in Adelaide. Called in to the local Museum and looked up a Conchologist there - Dr. Helen Laws, who happens to be a Kiwi from Dunedin - she has only been there a year, having taken over from Cotton. I spent several hours there talking and looking at the collection. Next day I looked up Mr. R. Hall who is the President of the Malacological Society of S.A. and he marked on the maps some good collecting spots down Yorke Peninsula. Spent a couple of weeks down there collecting some quite nice stuff, all common varieties, but was quite happy with it all. Got a nice collection of Haliotis - Laevigata, Conacopora, Emmae, Roei, & Cyclobates. Also a large Cellana C.rubraurantiaca (Blainville) Struck a bed of the scallop E.bifrons they were in the thick seagrass about knee deep at low water and collected about 60 specimens - rather small but in nice condition - had the animals fried for breakfast one morning and kept the shells - and very nice too ! ! Amongst this seagrass were a few Phasienella australis but all about half grown, collected some of the largest and they have cleaned up very nicely - the patterns on them are fantastic. Stuck in the sand everywhere were thousands of the large 'horse-mussels' or Pinnas - had to be very careful wading around, as they are not too good to step on - beastly sharp, in fact. Also plentiful in the sand here, just below low water, were the bi-valves Katelysia corrugata and K. scalarina- rather nice,shiny,with good zig-zag pattern in brown and about 1½"in size.Good eating,too,in fact the Adelaide people collect them for eating as we do the cockles and pipis. Altogether I had a nice trip down here as the weather was for the most part first class. From Adelaide I took a different route nearly all the way up to Melbourne,mostly inland;collected a few more Freshwater specimens. Passed quite close to the Grampian Mountains in western Victoria- they look very interesting too,and could be worth investigating at a later date.I don't remember seeing anything recorded from this area. The Grampians are an isolated group,rising abruptly out of the surrounding plains- look very rugged with many peaks-very jagged and vertical rock-faces.The highest peak is 3800'-they are really the tailend of the Great Divide-the other end being at Cape York N.Q."

(By the time you read this Laurie Price will be back in Queensland with intentions of tracking down more species of the large Varahadra land snails

--oOo--

THE NEW ZEALAND VOLUTES.

Part 2.

N.Gardner.

In this issue we list the smaller members of this family which belong to Leporemax(Iredale)and Teremelon(Marwick).

While two species are at times washed up on ocean beaches,the others are very rare and from deep water so are out of reach of most collectors.

Alcithoe (Leporemax)fusus fusus Q.&G.

Fig.1.

The characteristics of typical fusus are:- inflated body whorl without any angulation or shoulder,longitudinal ribs on the spire whorl which fade rightbout on the pentultimate and body whorls.

Colour pattern is usually longitudinal,zig-zag lines,although some specimens may be of a plain flesh colour.

Size:-up to 84m.m.

Distribution:- South of East Cape down to Stewart Is. on the East Coast. On the West Coast- Farewell Spit northwards along the Manawatu Coast.

This is the shell which was listed as gracilis (Swainson) in older publications.It occasionally washes up on ocean beaches after storms, and has been trawled down to depths of 60-70 fathoms.

Alcithoe (Leporemax) fusus haurakiensis Dell

Fig. 2.

Differs from the typical species in being smaller, more slender and has a ribbed shoulder, which angles the outline of the later whorls. Ribs less numerous on the spire whorls, while those on the body whorl 8 - 14 are stong and extend over much of the upper portion.
Colour pattern: also of longitudinal zig-zag lines but these tend to be arranged in several bands running spirally around the shell.

Size: 30 m.m.

Distribution :-

This northern sub-species is recorded from Great Exhibition Bay, Tokerau Beach, Bay of Islands, Mangawai, Great Barrier, Colville and Bay of Plenty. The Southern limit seems to be in the vicinity of East Cape and Hicks Bay. Washes up after storms, but good specimens are usually dredged down to 60 fathoms.

At times good live specimens wash up on Waiheke Island beaches. Type specimen is from Oneròa beach, Waiheke Is.

Voluta (Leporemax) chathamensis Dell Fig.3.

This is a very rare shell from the Chatham Rise area, and occurs in very deep water - 130 -300 fathoms. So far only three specimens have been recorded . The type and one paratype are in the Dominion Museum while the other paratype is in the Canterbury Museum.

This species is about the size of haurakiensis but differs in the total supression of axial sculpture, the lack of a noticeable shoulder on the whorls, finer columella plaits and the quite distinctive colour pattern which is a light orange brown ground colour with dark red-brown dashes arranged in an up and down fashion in approximate spiral rows.

Size : 47 m.m.

Alcithoe (Leporemax) hedleyi Murdoch & Suter Fig.4.

Similar to haurakiensis but is much more slender in outline, has a narrower aperture and distinctive ribbing which appears as long folds on the body whorl.

Colour usually of darker zig-zag lines as in haurakiensis.

Fig 1.

Fig.2.

Fig. 4

Fig.3.

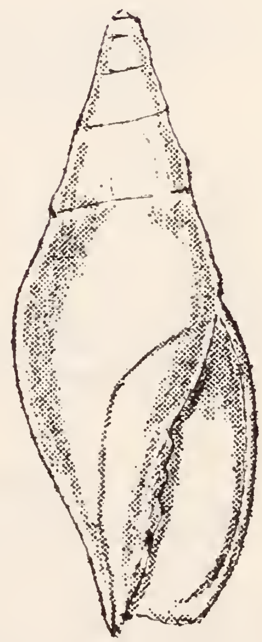


Fig.5.

A.K.H

Most of the known specimens have been taken from the East Coast, north of the Bay of Plenty. The type is from off Great Barrier Is in 110 fathoms. Other records are off Cuvier Is, Whangaroa and Great Exhibition Bay.

Size : 61 m.m. (type).

Teremelon knoxi Dell Fig.5.

Is another deep water species from the Chatham Rise. This is a narrowly fusiform shell, the aperture being half the height of the entire shell. While the lower whorls appear smooth, they do have low fine spiral threads. Most examples are chalky white and the aperture a biscuit brown. The edge of the inner and sometimes the outer lip shows olive green colouring.

Size : 80 m.m.

Locality : 220 - 300 faths.

Chatham Rise.

This is the only living member of the genus which was, until fairly recently considered to have been extinct since the Tongaporutuan Stage.

--oOo--

EGMONT PARYPHANTA.

From reports and what we have seen, it certainly looks as if it is merely a matter of time before we will have a further race of living Paryphanta recorded from the North Island.

I refer, of course, to the puzzle of the dead specimens which have been collected over the past few years from stream beds and banks on the northern side of Mt. Egmont.

Normally, the supposed occurence of large snails on the side of a dormant (supposedly extinct) volcano would not be taken very seriously for they would not be expected to survive the periodic eruptions and ash showers as they are considered to be of fairly ancient origin. Research has shown that the snails were dispersed over practically the entire country prior to the last ice age.

Though not personally familiar with the geology of the area in question, it may be that an outcrop of the older rock on which the cone of Egmont has been built up, has, escaped devastation during eruptions.

That such chance survivals occur is shown by the example of a Wainuia on tiny Motutaiko Island in Lake Taupo - an area which has seen much thermal activity and which has been blanketted with extensive pumice showers in the past.

So far all the shells of the Egmont Paryphanta have been found on the Northern side where the Mangorei and Henui streams have yielded a few examples - several in quite good condition apart from the collapsed apical whorl. Being of weak and thin construction this is always the first to disintegrate.

On looking at a map of this area you will see that these rivers drain a watershed which reaches well up into Pouakai Range. This Range goes above the bush line.

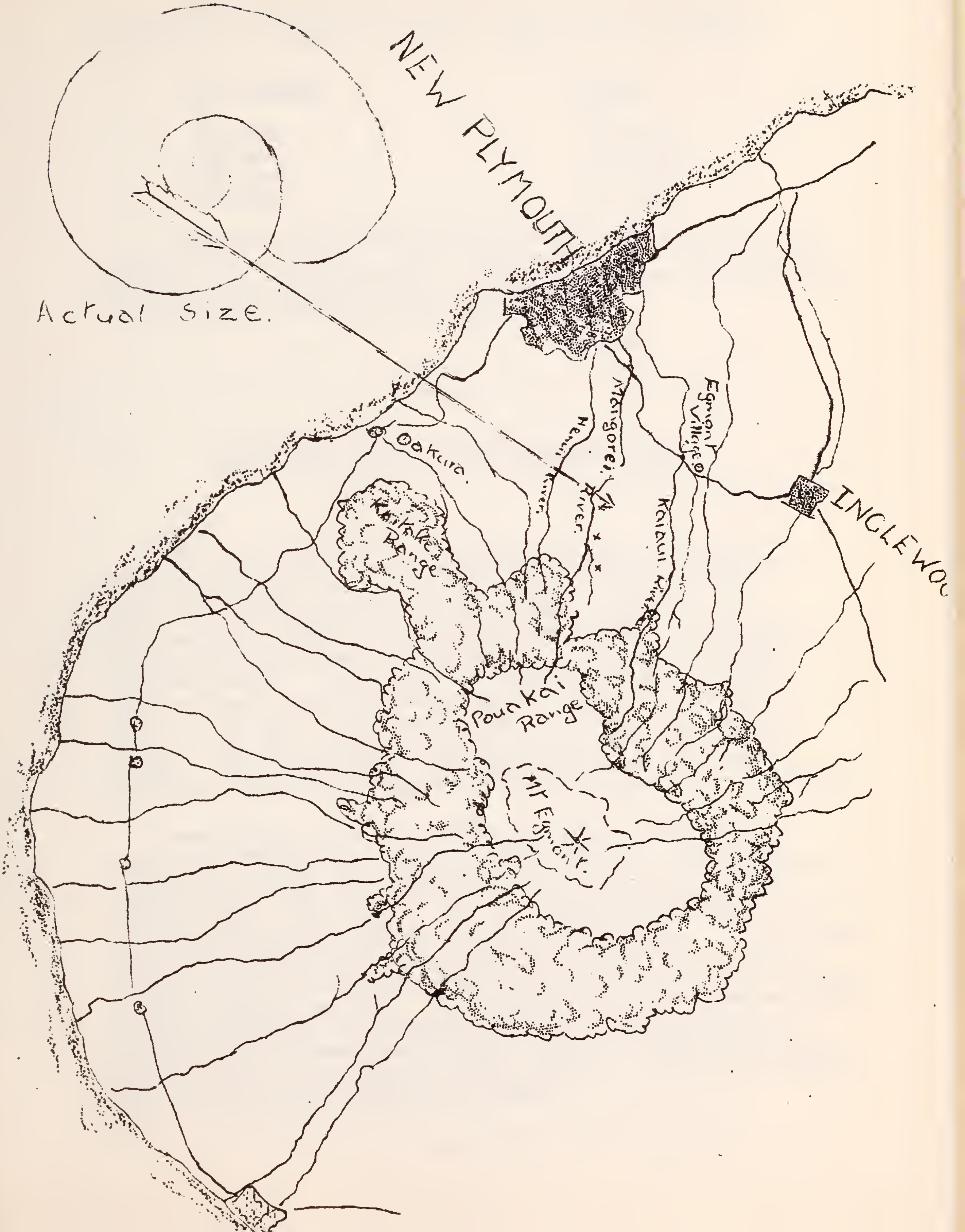
At Mokai Patea, inland from Taihape, and at 3600 feet I have collected numerous specimens of typical P.marchanti just inside bush at the snow-grass level. It seems reasonable to expect to find the Egmont snail alive at a similar high altitude. Nearly all the snails of the hochstetteri group favour such a height. Much of the information we have on these dead snail shells has been gleaned from various sources by our New Plymouth member, Mrs R. Duffy.

The quote below is from the Taranaki 'Herald' March 4th. 1964.

" New Plymouth conchologist Mrs.R.Duffy, said today that she sent a number of the snailn to Dr. Dell. Several of them came from the Taranaki Museum including two recently found near the upper reaches of the Mangorei stream and in the German Hill area between Kaimiro and Kent Road.

One was found by a High School Boy, Graham Radford, Kent Road while fishing, and the other by his Mother Mrs Radford.

Dr. Dell confirmed that the snails were of the marchanti species. In a letter to Mrs Duffy, he said it seemed quite clear now that the marchanti formerly ranged much more widely in the lower portion of the Central North Island."


Actual Size.
NEW PLYMOUTH
INGLEWOO
Oakura.
Henui River.
Mangorei. River.
Egmont Village
Kaiauai. River
Range
Pouakai Range
Mt Egmont.

Compared with the largest P. marchanti in my collection from Mount Colenso 3600', the new examples are a little larger in size. Comparison as below :-

Mt. Colenso	Egmont.
52 m.m.	68 m.m.
57 m.m.	67 m.m.
48 m.m.	63 m.m.
47 m.m.	60 m.m.

Although the colour in the dead shells is probably bleached to a degree, it is noticeable that the spiral bands on top of the shell, rather prominent in marchanti, are supressed and show only weakly.

Editor.

--oOo--

WANDERING WHERE THE WILD WINDS BLOW.

Norman Douglas.

The area concerned in this article is the coastline lying between the Manakau south-head lighthouse and the northern banks of the Waikato river mouth. This is a stretch of about twenty-five miles of our West Coast's rugged, windswept shore-line, where the Tasman rollers almost perpetually pound upon a black ironsand beach, and upon the brown sandstone cliffs, with an ever changing mood and pattern. One day the sky and sea may be deepest blue, the surf crackling white, and the gulls wheeling about with the joy of living; yet another day the sky is leaden and the rollers thunder in on miles of beach waist deep in froth.

One cannot help wondering how any animal could possibly survive in such an environment. Thousands of tons of water rush against the cliff. We feel the ground shake beneath our feet. The frothing spray shoots high in the air. It is caught by the wind and soars upon the cliff-directed updraught. Sometimes these blobs of froth float hundreds of feet over the cliffs and are seen upon farm paddocks half a mile away. As one watches in awe, this battle of the elements, this struggle between the surging sea and the stationary cliffs, one is reminded of that seeming battle of words said to be a scientists' little joke - the irresistible force meeting the immovable object !

Just how could any living thing survive in such a caldron ? Yet we know that when the storm is over that little limpet on the rock will be sliding along and going about his business as blithe and happy as ever! That was nothing it seems to say. " I can cling ! I know a little depression in the rock to which I return every time I wish to rest. " But we know, too, that not all its kind will come through this testing time as care-free as the limpet. As we walk along the frothing shore, suddenly, " What is this ? " Oh! What a violet beauty ! Janthina violacea, 30 m.m. wide and complete with the long trailing bubble-raft of the animal. There's another, and another ! " But this last one is different. It is Janthina exigua, not so large, but even more violet than violacea. These have been cast ashore from their floating home upon the deep, just as thousands of Spirula spirula have been driven ashore after first floating up when released from the depths. And we notice too, that comparatively few of the heavier shells are thrown up while the storm rages. Rather it would seem that they are held back by the terrific under-tow of the huge waves.

Now the storm is over. The sea is calm. There are about two or three rows of small crumbling waves only. It has been calm for days. Now it is so different. Where formerly the storm-waves had swept the beach broad and flat, now the scouring eddies are working the beach into"holes". The sand is building up in one place while going down in another. At the head of these holes, which may be half a mile or so apart, and as the tide recedes, we can see a line of degris strewn upon the sand. This is where we may find some interesting shells. Some of these may be alive: Austrofusus glans, Zeatrophon ambiguus in its lovely cream and pink, dimply shell, Zenophalium pyrum, Alcithoe swainsoni, Mactra discors, Spisula aequilateralis, Amphidesma subtriangulatum, Dentalium nanum, Cirsostrema zelebori, Neothais scalaris, Amphidesma australe, Angulus gaimardi, Dosinia anus and Dosinia subrosea, to mention a few.

If we walk along both the low-water and high-water mark we may find quite a variety on this beach. Here are some species taken from the area which are in the author's collection: Bassina yatei, Perna canaliculus, Modiolus neozelanicus, Chione stutchburyi, Ostrea sinuata, Anchomasa similis, Pholadidea spathulata, Monoplex australasiae (broken) Lepsiella scobina, Struthiolaria papulosa, Scutus breviculus, Poirieria zelandica,(2 alive after a storm in June) Maurea cunninghami, Lunella smaragda, Tonna haurakiensis (broken) Penion ormesi (broken

Alcithoe swainsoni motutarensis, Panope zelandica, Divaricella huttoniana, Amphidesma ventricosum, (not plentiful),small), Angulus spenseri (single valves common, but not alive), Soletellina nitida, Gari lineolata, Hyridella menziesi (probably came out of river), Offadesma angasi (usually broken) Resania lanceolata, Zenatia acinaces, Myadora striata, Amphibola crenata, Melarpaphe cincta, M. oliveri, Baryspira australis, Melagraphia aethiops, Alcithoe eggs attached to Zenophalium pyrum, to a small Mactra discors, to an Austrofusus glans, to a small Baryspira australis, to Zethalia zelandica, and to an unidentified shell something like Zeacumantus lutulentus, but snow-white. Continuing and taking shells in the collection at random we find : Protothaca crassicosta, Maoricolpus roseus, Trochus tiaratus, Pecten novaezelandiae, Notoacmea pileopsis, Cellana ornata, Cavodiloma coracina, Cellana radians, Patelloida corticata, Argobuccinum tumidum, (not good specimens), Nerita melanotragus, Maurea punctulata punctulata, Notirus reflexus, Cominella adspersa melo, Cominella adspersa adspersa, Zegalerus tenuis, Pholadidea tridens, Chlamys zelandiae, Zeacumantus lutulentus, Guildingia obtecta, and Cominella glandiformis.

As we fossick along this beach we may find some interesting pieces of rock that have washed up. Sometimes these contain many species of shells cemented together by sandstone. Or again we may look up to see a sea-lion, a sea leopard (very rare) or just a big glass net-float covered in long goode-barnacles.

The writer has been strolling along this coast on and off for the last forty years or more. Would you like to come and walk with me ?

--oOo--

In the 'Pacific Northwest Shell News' Vol . No. an article by Mr. T. Crowley on the strange freshwater fauna of Central African lakes, made very interesting reading. With due acknowledgement to the author and Pacific Northwest Shell News, we include it in this issue of 'Poirieria'

THE MOLLUSCAN MYSTERY OF CENTRAL AFRICA.

T.E.Crowley.

The two deepest freshwater lakes in the world - Baikal and Tanganyika - are also the only two lakes in the world to possess their own peculiar endemic faunal assemblages. In very many cases not merely the speciesbut the genera are unique, and the mystery as to how this came about has occupied scientists for many years and caused much bitter argument.

The strange animals found in these lakes are by no means restricted to the mollusca: Baikal even has its own freshwater seal, and Tanganyika boasts several freshwater crabs, polyps, fish of kinds unknown elsewhere and the only known genus of nonmarine jellyfish.

The molluscan fauna of the two lakes is profoundly different. The gastropods of Baikal, though unique, are fairly normal-looking fresh-water types, small brown and translucent; Valvatas and things looking like Bithynias and Planorbids. Many of these found in Tanganyika on the other hand, are hard, heavy and stony, especially the prosobranchs. Unless he were acquainted with the circumstances, even a conchologist could be forgiven for asserting them to be marine species.

The first shells to be described from Lake Tanganyika, were collected in 1858 by the famous explorer Speke, and described by S.P.Woodward of the British Museum the following year. They were mostly bi-valves, but as more shells came to hand and were studied by Bourguignat in France and E.A.Smith in England during the eighties, it was realised that they represented a most unusual pattern of ecology, a facies which had sufficient resemblance to the marine to rule out any likelihood of coincidence. Bourguignet gace to the stony shells the name "Thalassoid" meaning that they had a close resemblance to marine types. He claimed that this growth habit resulted from the intense storms and high waves to which the lake was sometimes subject, and to the fact that its water was brackish, or at least that certain parts of it were heavily charged with mineral solutions. Burguignet saw that in Tanganyika the 'Actual Centre of Creation' of the African Fauna, while Crosse (1881) believed that the Mollusca were actually marine types which had become modified in same way.

Other scientists were quick to point out that most of the Great Lakes of Africa were subject to storms, brackish water was common in them, that the waters of Tanganyika were regularly drunk by the natives and the established missions, and that many of the shells, though unknown elsewhere, were of fragile freshwater types.

With the discovery of the medusa in 1883, interest in the origin of the fauna intensified. Von Martens in 1897 put forward his 'Reliktensee" theory, which supposed that in ancient times the lake had been an arm of the sea, cut off by some geological upheaval, and which then became converted to freshwater so slowly that many of the animals were hardy enough to continue living and adapting themselves to the changed conditions.

J.E.S.Moore led two expeditions to the lake in the nineties, especially to study the fauna and explain if he could, its unique nature. The marine-like shells were by this time being described by the term 'halolimnic" inferring their actual derivation from marine species. Moore strongly supported the "Relikten-see" theory in his book " The Tanganyika Problem", 1903. This great lake, he said, the longest in the world, can be viewed only as a zoological remains of a departed sea, and he pointed out with some very fine illustrations the extraordinary close resemblance between the "halolimnic" shells and certain Jurassic marine fossils.

In spite of the painstaking care with whoch Moore worked out his hypotheses, few of the experts seem to have been convinced. Similarity between shells millions of years and thousands of miles apart, it was pointed out, is no criterion as to their specific relationship, and examinations of the lake area produced no evidence of past marine conditions, such as raised beaches, appropriate fossils, signs of a great geological upheaval etc. In fact the lake was just an extension (and the deepest part) of the so called Great Rift Valley. Opinion inclined once again to the possibility that the shells were merely an adaption to unusual conditions; at the same time, much studyfailed to show in what way conditions were so very unusual, except of course in the depth of the water (4700 ft) Germain then pointed out that most of the unique species were melanid in character and that other melanid faunas, not quite so strange but still quite distinctive, occur in Lake Nyassa and in the streams and pools of the Congo, in fact that the rather monotonous freshwater fauna of Africa is sharply interrupted by a band of unusual assemblages stretching across the continent. The number of species involved in this band is considerable - in fact about a thirtieth of those described from the area by Bourguignet. Most specialists about this time agreed that the Tanganyika shells had not been derived from the marine types (except in early times, like all other shells), but had slowly assumed a marine appearance through the course of centuries under suitable conditions; in fact that they were "convergent" and not "divergent"; and that the same sort of thing was happening, though at an earlier stage and a slower rate, in other parts of Africa also. But WHY ?

The latest theory, put forward after intensive study by Vivian Fuchs in 1936 also seems the most workman-like and seems to have found wide acceptance. Fuchs investigated the history of the lake by studying the fossils of the Rift Valley. He found fossil shells in the neighbourhood of Lakes Albert and Edward which could be reasonably interpreted as forms ancestral to those now living in Tanganyika, there was a period of extreme aridity in Central Africa in mid-pleistocene times and it seems evident that all the lakes dried right up except Tanganyika; which is over 2000 feet the deepest. Thus the ancient lake fauna, killed off everywhere else, would continue to live in this lake, but would be modified in the salty concentrated waters and would increasingly take on a marine appearance. With the return of damper conditions the other lakes would receive the modern nilotic fauna, while Tanganyika, with a few modern additions, would keep its own.

--oOo--

NEW PUBLICATIONS

Just received from the Academy of Natural Sciences of Philadelphia the first part of Dr. Powell's family 'Turridae in the Indo-Pacific' The sub-family Turrinae.

This fine painstaking and beautifully illustrated Monograph is a distinct acquisition to our Section Library.

--oOo--

"CABESTANA FROM BLUFF"

. cu

Actual size.

Vol.2. Part 3. December 1964.

CABESTANA from DEEP WATER, off BLUFF Foveaux Strait.

Local collectors are inclined to look upon this genus as being a northern one; however, for the past few months some interesting shells have been acquired by our Secretary and others, from a Bluff oyster boat operating in Foveaux Strait.

Cabestana spengleri (Perry) and Cabestana s. waterhousei, Powell, were present inthis material.

Cabestana spengleri had previously been obtained very occasionally from oyster boats by Mrs C. Smith of Stewart Is, but in the recent catches there are in excess of 50 specimens all from an area of approx. one square mile.

These Bluff shells seem to have a rather different appearance from the better known Manakau population. The nodules are suppressed while the axial sculpture is more prominent and ripple-like in some specimens. The varices are very large and flat, the outer lip being flared in adult specimens, giving the shell a flattened appearance.

These shells grow to a very large size, as in one consignment there were four examples of $6\frac{3}{8}$", $6\frac{1}{2}$" $6\frac{1}{4}$" and $6\frac{1}{8}$". A Manakau Harbour specimen of 5" would be near to maximum I would think.

Cabestana waterhousei segregata. Powell.

While previously recorded from Auckland East Coast, Manakau Harbour and the Chatham Is. the specimens in this material provide us with a further rather unexpected locality record.

All our northern examples have been obtained from low tidal zones in areas of rocky shoreline. We do not seem to have records of this mollusc having been taken by local trawlers from deeper water, but the Bluff Boat has been operating in 25 faths. and has dredged up a dozen or more specimens, all in very fine condition, complete with epidermis and strong hairy processes.

Mention must be made of one specimen of exceptional size - just on 4 ins., which is also very much larger than any we have had from Northern areas.

--oOo--

A VISIT TO STEPHENS IS. & CHETWOODE ISLANDS.

O.J.Marston.

Most N.Z. conchologists are familiar with the sketch of Rhytida stephensis in Dr. Powell's "Shells of New Zealand", but very few have had the opportunity to observe the live snails and in their natural habitat too. For a fortnight during July - August 1963 I had the great privilege of jioning an official working party on those islands, with permits supplied by the Internal Affairs Department.

FRENCH PASS.

The small settlement at French Pass is 88 miles by road from Picton, via the Queen Charlotte Drive. D'Urville Is. about 20 miles in length, forms the northern side of French Pass. Our launch trip was also about 20 miles in a north-easterly direction as the Island lies off the northern tip of D'Urville Is.

STEPHENS ISLAND.

Fortunately for naturalists, the island is almost inaccessible to other than official and expected visitors, and the island is quite free of such pests as wild pigs, deer, oppossums, wild cats and dogs, rats and mice, hedgehogs and wekas, with the result that flora and fauna survive there. The cliffs along the western side of the island average at least 600 feet, and around the rest of the island they range from 200-400 feet. Because of the southerly swell we couldn't land on the rocks, so cruised around until the light-house keepers spotted us and came to our assistance. They lowered slings from their derricks, and one at a time we and our stores were hauled up about 50 feet to the landing stage. It required good timing to synchronise with the heaving launch, and several sea-sick travellers were glad to be on firm rock again. From there there was a haul up to the light-house compound at 600 feet, but there was nothing to complain about as the little blue penguins braved the surf, scrambled up the 600 feet, moaned continuously all night, and trekked down to the sea again just before daybreak.

Stephens Is is controlled by the Marine Department as a lighthouse reserve, but now they use only the north east third for the light, houses and grazing of the keeper's cows, bull, sheep. By courtesy of the Marine Department the remaining two thirds is fenced off as a flora and fauna sanctuary under the control of the Wild-Life Branch of Internal Affairs Department. Part of our job was to check every wire, batten and post to ensure that in the ensuing year there would be no opportunity for stock to break through into the Reserve.

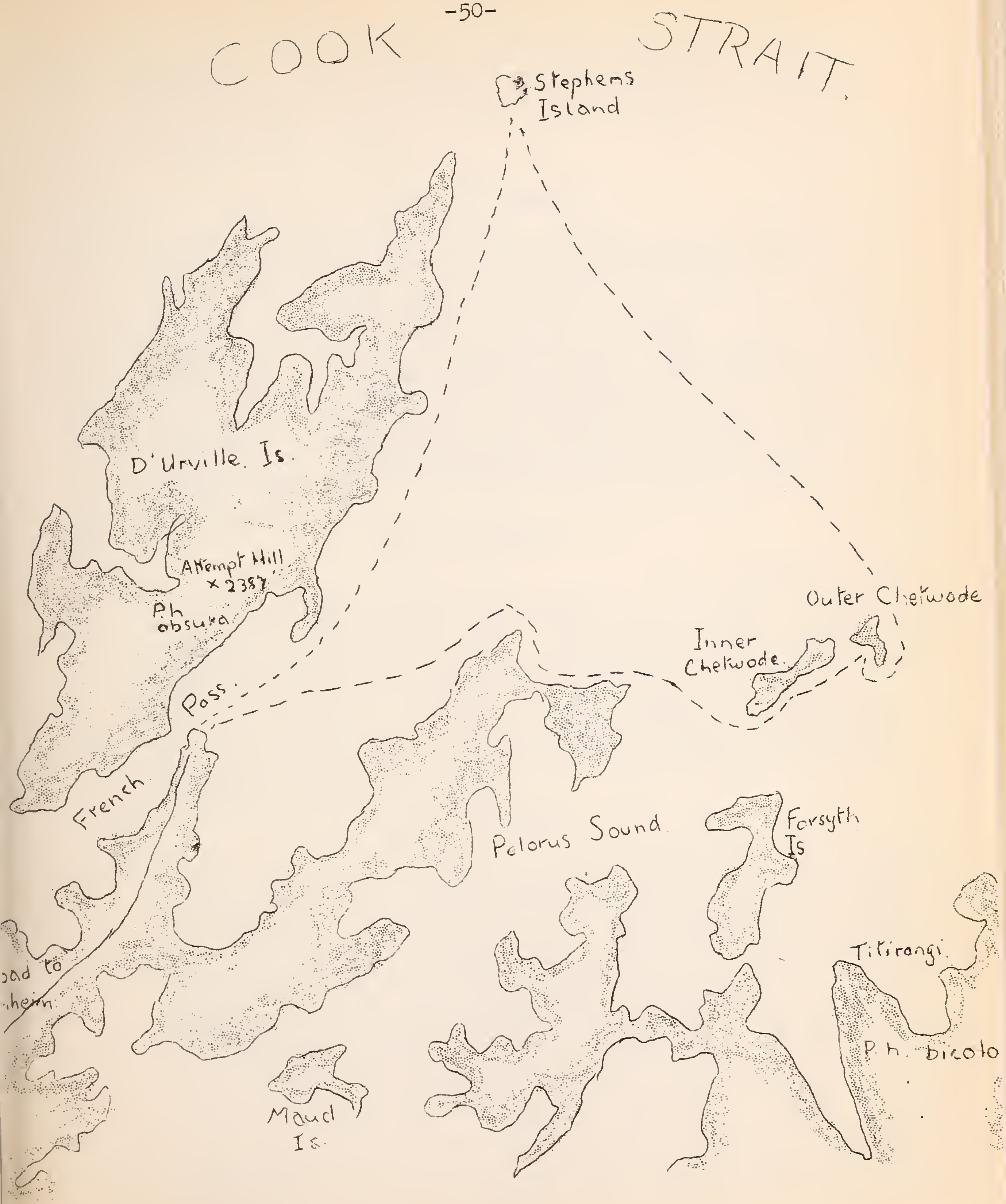
Our next job was to plant 500 taupata (Comprosma repens) trees to help form wind-breaks and link up the existing patches of ngaio, taupata and poro-poro etc. We weeded around the plantings of previous years to help the young trees where the grass is two to three feet high, and to discourage the wetas from climbing them and stripping every leaf. As I had always been used to finding Rhytida in bushy areas I looked longingly at those areas, but was in for a great surprise. We found live Rhytida stephensis living around the base of the dense grass almost around the whole island; the rich soil has never been ploughed, rainfall is regular, and the grass thrives. The bush areas were shunned by the snails; no live ones were taken there, and only two empty shells turned up after a week of searching under the trees. My biggest and best shell was found under a taupata hedge right near the lighthouse. The partly decayed snail was still in the shell, and must have originally crawled there from the nearby grass as there were two live young ones there.

More live Rhytida and four smaller snails were found in the grass at 900 feet, the highest point on the island, and still more were found while weeding in the south-east corner. These areas all have high dense grass.

R.stephensis also proved to be plentiful on the dry ridges above the cliffs on the southwest side of the island. The grass grows poorly in the stony soil, and the principal plants are Muhlenbeckia complexa and the native ice-plant Disphyma australe. The snails were found under large stones, and especially where the stones were piled upon each other in small consolidated areas. Geckos and skinks were very common under the stones too. On 23rd July two Rhytida were found in copulation, suggesting that the eggs were laid in early spring.

After skirting well around the "Frog Bank" scree, where the rare native frogs are found, we came upon a patch of original bush cover of the island. Long before the island was gazetted as a flora and fauna sanctuary the rarity and value of much of the island's wildlife was recognized, and this block which had escaped the clearing fires was fenced off. The taupata planting around that block is designed to give cover, and to speed natural regeneration.

I had hoped to find some trace of P. hochstetteri obscura there, but was unsuccessful. In the 1930 Rec.Auck.Inst.& Mus. Vol 1, No.1., Captain J.Bollons is noted as having recorded P.h.obscura there. Dr. Powell (ibid.p.40) states " To the west of the Pelorus on Stephen Is. and on the range extending from French Pass to the saddle near Tophouse the sub-species 'obscura' is found, to the exclusion of 'bicolor'." If P.h.obscura no longer survives there then it would be an excellent place to reestablish them before they have been exterminated


COOK STRAIT.
Stephens Island
D'Urville Is.
Attempt Hill
× 2387
P.h. obsura
French Pass.
Outer Chetwode
Inner Chetwode.
Pelorus Sound
Forsyth Is
Titirangi
P.h. bicolo
Maud Is.

by pigs, rats and wekas on D'Urville Is., and on the mainland. Although Wainuia urnula nasuta are found on D'Urville Is. too, they do not appear to be on Stephens Is., although the two islands have obviously been linked through Cape Stephens and Stephens Passage.

CHETWODE ISLANDS.

The Inner and Outer Chetwode Islands are situated in the open sea just outside the entrance to Pelorus Sound. Both are now flora and fauna sanctuaries too, but it is possible to land on them, and there are no notice boards to warn intending parties against landing. Pigs have "appeared" on these two sanctuaries, and it is considered likely that some "sportsmen"are doing that deliberately to facilitate their pig shooting expeditions. Our local newspaper has reported this year that the same thing is happening in Queen Charlotte Sound, and members will be disappointed to know that Blumine Is. was one of those listed (the only place where P.h.bicolor is found at sea level).

OUTER CHETWODE.

A deputation of six wekas met us on the beach, so that did not augur well for land snails. The island has been partially cleared for sheep farming but groves of Kohekohe kawakawa, and manuka exist. One living adult specimen of R. stehpensis was found, and we saw a weka eating another almost beside us. On a scree covering of bracken and Comprosma lucida I found an empty juvenile specimen, and only a few feet away from it another Rhytida, apparently meesoni. We checked thoroughly to see that no pigs were left to continue breeding.

INNER CHETWODE.

The original bush cover has remained intact, with a dense canopy overhead. Common trees are matai, kohekohe, nikau and kawakawa; and on the drier ridges manuka and Olearia paniculata. Our party spent two days combing the island for fresh pig signs, so would have noticed any snail too, but there we no signs of Paryphanta, Wainuia or other species of Rhytida. This seemed surprising as the channel between the twomislands is only a matter of a few chains across. A live peripatus was found under a log, and a few small snails at the base of nikau leaves. The two small snials taken alive on examination prove to be Therasia decidua.
From Havelock to the Chetwodes would take a launch at least four hours each way, so these sanctuaries are safe from day trippers, but not from longer camping parties. Rhytida stephensis has been reported from a third island nearby, but I have not yet had the opportunity to visit it for myself.

A CONCHOLOGISTS DREAM.

A play in two acts.

Act 1. Place - A northern beach.
Act. Place - northern home.

Time - Low spring tide.

Act. 1.

The first act takes place on a middle northern beach, where a very rocky area is exposed by low tides. About a hundred yards apart are two female figures, both busy turning very large rocks and in the usual position of conchologists --- heads down and ....

First voice " Do you want any Mayena australasiae?
Second voice " Only if it is complete, perfect protoconch too."
First voice " No, this one can go back, but will look for another one for you."
Silence reigns, occasionally broken by the splash of rocks being returned into position.
About an hour later :- 1st Voice " I've got a beauty for you, spire is perfect right to the last whorl, but ," pause " It's got a funny yellow lip. Never mind, I will put it in the bag and give it to you later".

Act.2.

Another long hunt and both figures return to the car, have tea and wend their way home. After dinner, a post mortem is held and numerous small species discussed. Supper served First voice " Oh! your Mayena. Here it is".

With a horrified gasp, 2nd voice " But...but... that's not a Mayena, that's a perfect Austrosassia parkinsonia!!".

Enter male :- What's this? an Austrosassia, that's not! It's far too big, we have one in the collection". Rushes for tray and brings in a poor eroded beachworn specimen with only half a spire. "See here it is". Lip compared, could be? Out comes the conchologists bible Dr. Powell's Seashells of N.Z. Illustration compared and size noted, 36 m.m. X 21.5 m.m. "What's the size of this new specimen?" Out come the calipers --- What ? 40 m.m. X 27 m.m. alive and perfect.

Curtain goes down with 1st voice exclaiming " Well, I don't think I can give your Mayena to you now".

--oOo--

ODDS AND ENDS.

Phil Warren.

I've just been reading through my notes on Littorinidae in the last "Poirieria". In passing I remarked that there is a big field of research awaiting attention among these shells; since last year when the article was written - quite a bit of investigation has been done on Zelaxitas by Winston Ponder who has found that they are not Littorinids at all; they belong in the Rissoidae, though just where has not yet been determined. Just one more example of the mass of work waiting to be done on such groups!

Further to my finding Rhytida dunniae and other native snails among the victims after using "Blitzem" pellets in the garden! I dropped a few pellets in one or two places in the bush not far from here without much result. Two or three Phrixgnathus, a Thalassohelix zelandiae, one Liarea ornata and 5 Oxychilus cellaria ! (the latter an introduced snail). The long dry summer <u>could</u> have had some effect on such a poor bag but now that the drought has broken I am going to try a patch of bush down the road where Liarea and Ptychodon tau are often abundant, and see what turns up there.

<u>Agnewia tritoniformis</u>.

The range of this rather rare member of the Thaisidae is now increased. Some time ago a good specimen was discovered at Tolaga Bay, prior to this it was not known beyond East Cape. This specimen is now in the possession of Winston Ponder. Five years ago I found one fragment in shell sand at Goat Island Beach, a year later 2 empty shells (one adult, one juvenile) were found in the same place, namely at the northern end of the beach among the large boulders where washups are common. Last year we discovered 3 live specimens, 2 adults and one half grown, under rocks in a channel below the cliffs on the way round from from where the Field Station is towards Cape Rodney.

Last Easter a group of students came up for field studies with Professor Morton and Dr. Gilpin-Brown. They had a most interesting series of aquarium tanks in use at the Field Station with a fine array of Zoology specimens as well as algae. Many active molluscs including one angry octopus, some Scutus, Limpets, Cominellas and so on, but in particular the Nudibranchs were well worth seeing. It's only since the University came up here that I realised we had so many species of Nudibranchs in this area.

I was invited to accompany them over to Pakiri Beach which was unfortunately devoid of shells as is so often the case these days. The river has cut a new course and now runs further north than before, but it's much easier to cross than it used to be. Professor Morton gave us an extremelyinteresting series in insight into the botanical features of the sand dunes. There are a lot of plants there when one has them pointed out. There were masses of dead Helix aspersa which had been trapped in the dry sand after the adult lupins had died down in the summer. Paralaoma and Elasmias still thrive in the middle dunes under a covering of Muhlenbeckia and Tetragonia.

--oOo--

FOSSICKING AROUND THE EAST CAPE.

Norman Douglas.

It was during the May holidays, 1964, Heather and Murray were home from College, most of the cows were out. The weather was fine and it seemed a good time to examine further shores, so out came the conchologists low tidal chart. Times and dates were studied and plans drawn up for a ten day break-away from work. Perhaps we worked harder than ever ! In any case, in company with the Boase family, our little cavalcade of cars and trailers arrived at Mt. Maunganui jjust in time for the mid-day low-water of May 11th. This is a very interesting area for the sheller. Under the Pilot Wharf there were over twenty Xenophora neozelanica alive, Some with live specimens of Terebratella haurakiensis attached to their backs. There was also a live Murexsul cuvierensis, 72 m.m. long and many Penion adusta mandarinoides crawling over the rocks . Other shells found in the vicinity were :- Phenatoma novaezelandiae novaezelandiae (a few); Cominella virgata virgata were abundant and of large size. There were a few very fine specimens of Paratrophon stangeri at low water in muddy sand. Gari stangeri, in many fine specimens of multi-hue were found at the entrance of octopus hideouts in the channel near the beacon . Amongst the rocks there, too, Cookia sulcata was commonly seen alive and, of course, the usu usual multitude of pipis carpeted the beach.

Next day, while passing along the Bay of Plenty we paused at Ohope Beach, but found very little there. Perhaps the most noteworthy shells were the toheroas, but none I saw reached 3" in length. At nightfall we camped on the shore of Waihau Bay, beside a Pohutukawa tree with a branch spread of forty yards. We visited Mrs Walker and saw her splendid collection of New Zealand and Australian shells. We were directed also to a place, where next day, we were thrilled to find ten specimens of Ellatrivia memorata. These were found in the shell deposits near high water mark and at the high water end of shallow channels in the rocks leading out to sea. Charonia capex and Charonia rubicunda are occasionally found alive in this area and their weather beaten shells were seen upon the beach. Live specimens of Mayena australasiae and Murexsul octogonus were seen among the low water rocks and the pink form of Notocorbula zelandica were common in the sand. To name all the shells we saw there would nearly fill a page. Altogether we were loath to leave this lovely bay.

About thirty miles further on, at Te Araroa, one camps within striking distance of the East Cape area which was full of interest for us all. The slate-grey towering cliffs were dotted with white fossil shells, some of large size, like the Arca shells of warmer seas. One of these appeared to be Cucullaea waihaoensis. The high water shells deposits at points along the road that leads to the Cape, are filled with minute shells as well as larger types. I found another Ellatrivia memorata and there were a few beachworn Vicimitra maoria on the sand. The beautiful golden limpet, Cellana radians flava, was abundant, living on the tidal limestone rocks. They wear out little depressions in the soft rock, in which they rest while the tide is out. Because the golden limpet appears to live on the soft limestone only, this seems to cause a sharp division in the limpet species according to the rock type of an area. Cellana ornata and especially Cellana denticulata, obviously preferred the harder, rougher rocks and shunned the soft smooth, mudstone localities. One of the golden limpets we saw was carrying a Notoacmea helmsi helmsi upon its back.

As the road does not reach the East Cape, we walked along the beach a mile or two, to where this headland and island could be seen. The beach was strewn with huge beachworn Cookia sulcata and paua shells, and dead Argobuccinum tumidum were common on the midlittoral zone. Under rocks at low water hundreds of Buccinulum colensoi are to be found. By far the most common form of these is a grey one, having nine deep lines around the body whorl. It has axial dark markings between nodules and reaches about 18 m.m. in length. But the larger type, 25 m.m. of greyish-yellow and having about 18 or 19 fine lines is present there and it is conspicuous by its contrast. Also, among the low tidal rocks, crabs were seen using the shells of the deep water Buccinulum fuscozonatum. About half a dozen of these were found.

Undoubtedly the most interesting discovery we made near the Cape was the finding of a variety of Cominella, which proved, to be unknown to Dr. Powell. These shells are almost identical in shape to Cominella nassoides, of the Forsterian Zone (even having the same number of axially elongated nodules on the body whorl) but they are heavily granulated and finely spotted in dark brown all over a creamy-yellow base colour. All the specimens found were dead shells and they were being used by the hermit crabs of rock pools at low water. In all, a total of ten specimens were found, the largest being a very handsome one of eight whorls, 33 m.m. X 18 m.m.

Travelling down the coast, we stayed a night at Tokomaru Bay. The cliffs in the north are fossiliferous and beaneath the rocky headland, just north of the wharf, and at low tide, a fine clean white specimen of <u>Buccinulum sufflatum</u> was found alive in a rock crevice.

At Gisborne, about half a mile east of the Cook Memorial and in sight of the historically famous white cliffs of Nick's Head, there is a most interesting low water rock shelf. Here we found <u>Penion adusta adusta</u> were abundant in the long, shallow rock crevices. Also, <u>Buccinulum colensoi</u> were again plentiful, but quite differently coloured to those of the East Cape. While the latter are mainly pale grey, thin lined in black, the Gisborne variety are mainly very dark - dark brown to nearly almost navy blue all over. However these dark types appear to intergrade completely with a spirally broad striped kind, strongly reminiscent of <u>Buccinulum vittatum vittatum</u>. The Gisborne <u>Buccinulum colensoi</u> apppar to be all nine-liners, with the lines broader than those at East Cape. The larger pale liners appear to be absent.

Then, as if to prove that all need not be different at Gisborne, some hermit crabs were seen scuttling along in the new variety of <u>Cominella</u> shells which we had found firstly at East Cape. It was interesting to notice too, that these shells were quite indistinguishable from the East Cape specimens. We can deduct, therefore, with almost certainty, that this odd apparently new <u>Cominella</u> is distributed over at least eighty miles of the coast line.

In retrospective thought, I think one of the most interesting features we noted at Gisborne, is the great number of wekas thriving in the surrounding districts. In some areas they are so munerous that they become a pest to the farmer and "drives" are occasionally made upon them to reduce their numbers.

Our homeward journey took us through many miles of the magnificient Urewera bush, but we could find no large land snails there. Even the man shovelling the roadside water-tables knew of none. The minute bush snails seemed very scarc also. However we did find <u>Therasia traversi</u>, alive on a tree at Waikaremoana.

Now home again on our Waiuku farm, we think of the many beautiful bays of the East Coast that we had no time to visit and wonder how many new species maybe lurking there.

NOTES of an ECOLOGY LECTURE

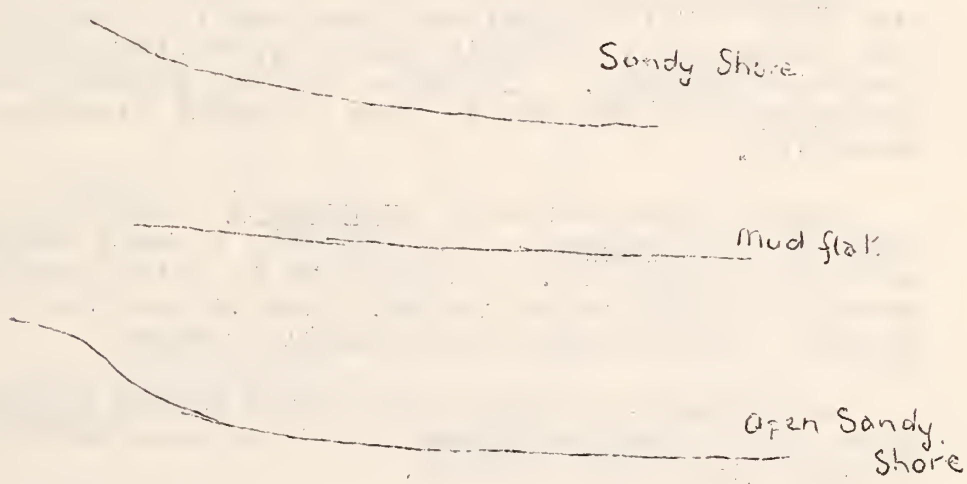
given by W. Ponder, 16/4/64 per J.Laxton.

The Sandy & Muddy Shore :-

Sand coarseness, wave strength etc. give the characteristics of the habitat.

Amphidesma australe is confined to sheltered beaches while A. subtriangulatum is found on more open shores. A. ventricosum inhabits ocean beaches. All are especially adapted to live in their own particular environment. The siphon of A.subtriangulatum is strong and stout, for living in unstable conditions. A.australe - siphon small.

No.1.



The Muddy beach e.g. Howick.

Has a great variety of animals.

Surface Crawling Gastropods:- On the high tide level several pulmonates are found. One variety. Ophicardelus costellaris crawls on the stems of the mangrove. These molluscs breath air and are believed to have developed in the mangrove swamps.

Amphibola crenata is found slightly lower down the tide line and is also a pulmonate. Amphibola belongs to the only pulmonate family that has an operculum.

In mid-tidal regions lives Zeacumantus. This mollusc is a micro-herbivor and leaves a long faetal trail behind it as it moves.

Cominella glandiformis also lives in this zone. It has a long siphon, a large foot and long tentacles with eyes at the base. A current of water is deflected into the mantle cavity onto the osphradium. It detects dead and dying cockles by this method. It can be noticed that these molluscs gather very quickly around the dying cockle showing that their detection sense is very sensitive.

Zediloma subrostrata lives on stones slightly lower down. Among the Zostera at low tide level of the mud-flat, Pectens can be found. They have evolved into a swimming animal and use their siphon and velum for this. The velum acts so as to deflect the water downwards giving both upward and forward thrust, and also steers the animal which can move both backwards and forwards.

Bullomorphs such as Haminoea live in this zone. It is a deposit feeder and lives at the surface of the mud, the muscular gizzard being used to crush the food. It is a blind animal.

Quibulla quoyi moves over the surface and strains mud for its food. This animal has eyes and its parapodia are not well developed. Also in this region lives the more highly developed Philine. It has a str ong gizzard and burrows under the surface of the mud to feed on small bivalves - e.g. piri juveniles.

Another Opistobranch, Bursatella (Notarchus) glauca FEEDS ON THE Zostera. It has only a small mantle cavity and no eyes to speak of. The trend in Opistobranch evolution seems to be the reduction anf finally the loss of the mantle cavity. Doxids have not a mantle cavity.

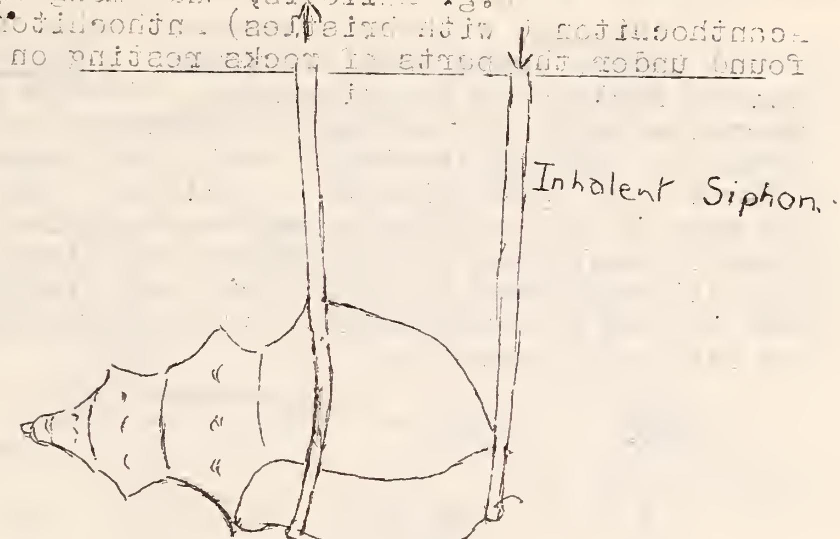
An elongated form of the small limpet Notoacmea helmsi lives on the Zostera grass, but the more typical form of this species lives under stones.

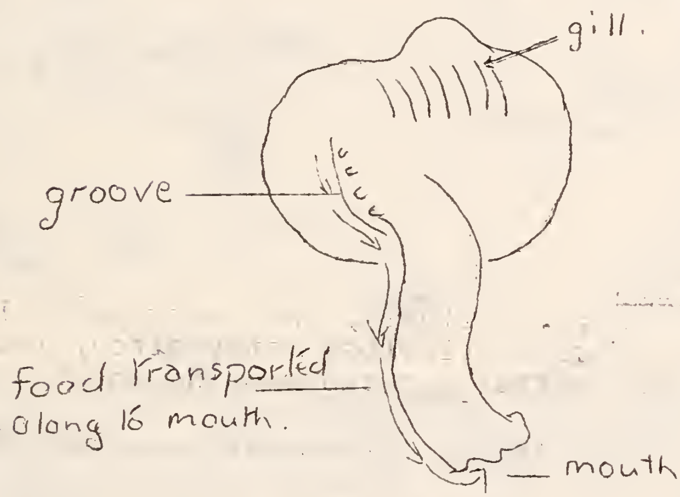
Micrelenchus huttoni also feeds and lives on Zostera. Occasionally Lunella smaragda can be found there too.

Among the bivalves of the luddy beach, Solemya parkinsoni can be found buried in the Zostera zone. This primative bivalve has a horny epidermis and feeds by pumping food into its mantle cavity with a pumping foot. Its gut is small.

A very common inhabitant of the muddy shore is Chione, the cockle. It has a muscular foot. A variety of animals live on the protuding part of the shell. For example, a barnacle, a sea-anemone and algae are commonly found on the shells of Chione.

Macomona liliana lives deeply buried in the mud. This animal has long separate siphons. It does not take in suspended food materials, but the inhalent siphon is used like a vacuum cleaner. It "vacuums" the surface layer of the mud. The mantle cavity has ~~very efficient~~





sorting devices.

Another bivalve is Nucula. This animal is primative and has only a small gill which is used exclusively for respiration. The proboscis is used for feeding. It is a deposit feeder.

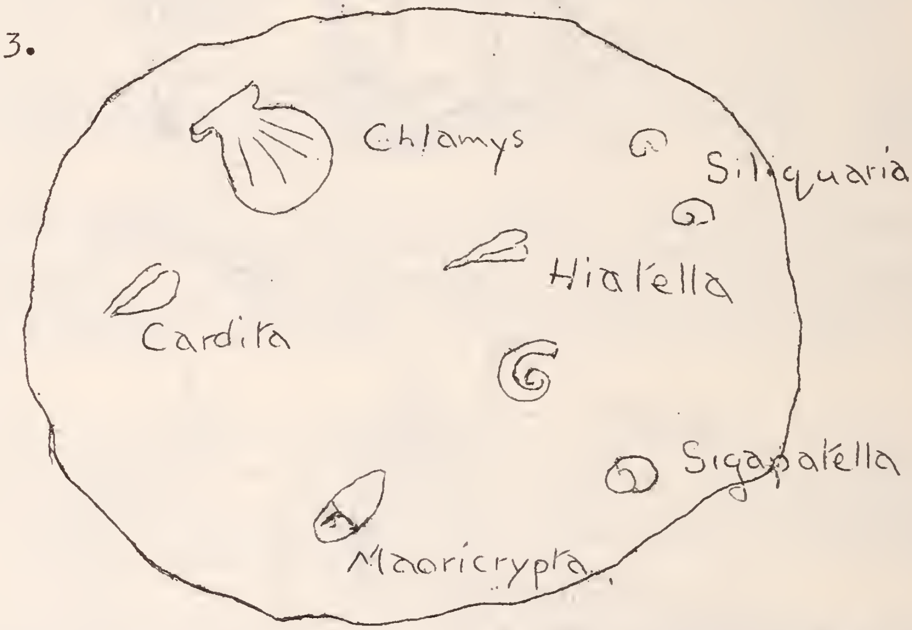
Cyclomactra ovata is a suspension feeder. It has a long powerful foot. The long siphon takes in planktonic food. Dosinia subrosea has long semi-fused siphons and has filamentous projections around the mantle edge.

There is an interesting example of commensalism found on the muddy shore. Scintilloma zelandicus lives on a sea cucumber. Scintilloma is never found without its sea cucumber. There is a similar example with Anchomasa, the large rock borer. On the shell where the two valves join in front many little bivalves

Arthritica may live.

In the zone below low water to about 6 feet deep, many of the larger gastropods are found. Barypsira lives here as well as further up the tide line. It has a long syphon and an operculum which is unusual for animals in this group. It crawls in the mud leaving a trail and feeds on small bivalves - Nucula and spat Chione. Alcithoe has a massive foot and uses it in feeding to smother animals. When they are dead, it sucks the animal juices out with its proboscis. The ciliary feeder Struthiolaria and bivalves which get their food in the same way build a tube of mud from the edge of the lip to the surface.

No.3.



Ciliary feeders under rock.

Struthiolaria has a long powerful tubular foot,. It uses the spine on the operculum to grip the substratum so that the foot can be contracted 1uicly, thus flipping the animal right way up. The same thing is found in tropical Strombus and Xenophora. See illustration No.2.

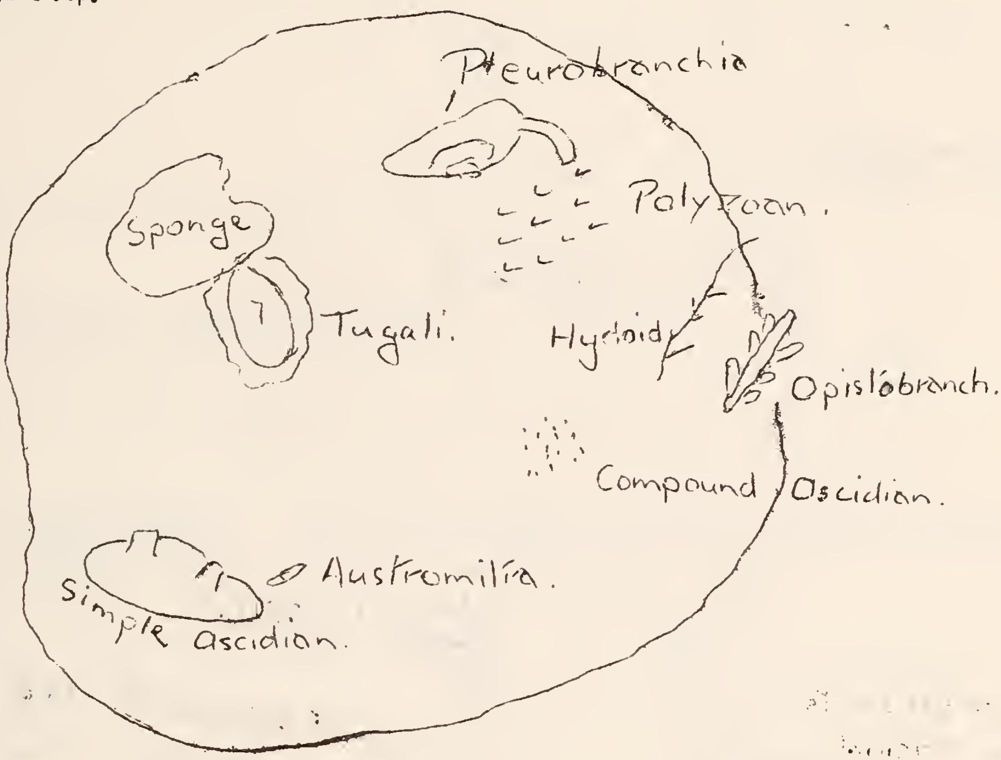
Each animal has its own feeding type - its own niche. Take a hypothetical stone - say, at Leigh. Under it can be found many types of animals, starting with the ciliary feeders, we have such bivalves as Chlamys zelandiae. Chlamys is attached by a byssus but it can retract this and swim just like its relative, the Pecten. Primitively, the byssus emerged from the middle of the shell, as is still found in Rochefortula remiformis.

Gastropod ciliary feeders are, for example, Siliquaria, Sigapatella and Maoricrypta. Siliquaria has an operculum with bristles. Cirolobis feeds by a mucus stream. It uses its large gills like Struthiolaria.

Herbivores

Carnivors

No.No.4.



Carnivors under Stone.

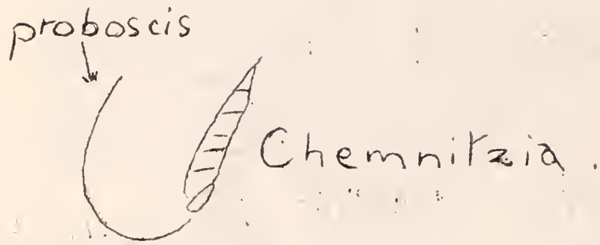
Austromitra feeds on simple ascidians. Tugali feeds on sponges. The alimentary canal of Tugali has to be able to accomodate the calcareous spicules from the sponge. The Opistobranch, Pleurobranchia, feeds on polyzoans and compound ascidians.

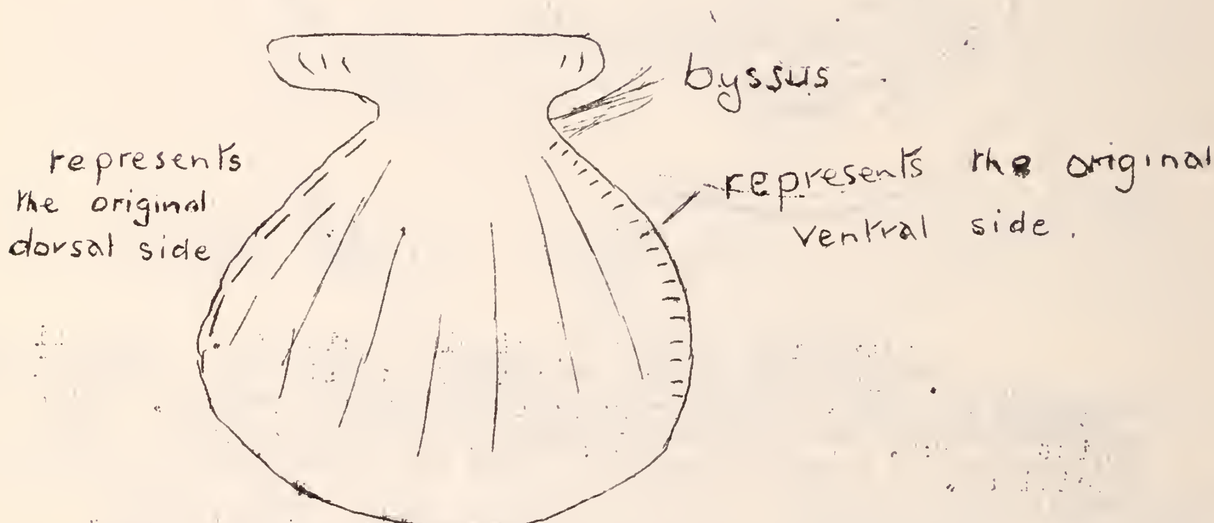
Hydroid feeders such as certain Opistobranchs pass the stinging cells (Nemocysts) of the hydroid, through the gut to the tips of the lobes. Here they function as a weapon just as they do on the hydroid.

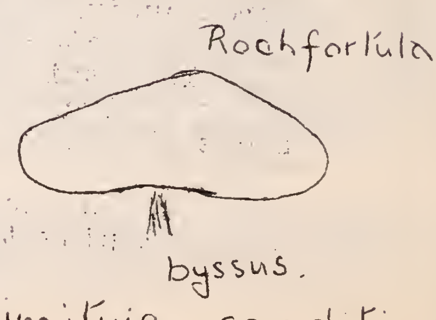
Buccinulum feeds on polyzoans as do certaib Doxids (Opistobranchs), Archidoris wellingtonensis feeds on sponges. Taron dubius feeds on polychaetes. Among the gastropods are some Ectoparasites such as minute Chemnitzia. It has a very long thin proboscis with which it pierces the tentacles of the polychaet without the host suspecting anything. It sucks the body juices from the tentacles.

The lobes are unequal because of unequal development. Is developing towards an equal condition as is seen in Pectens.

No.5.





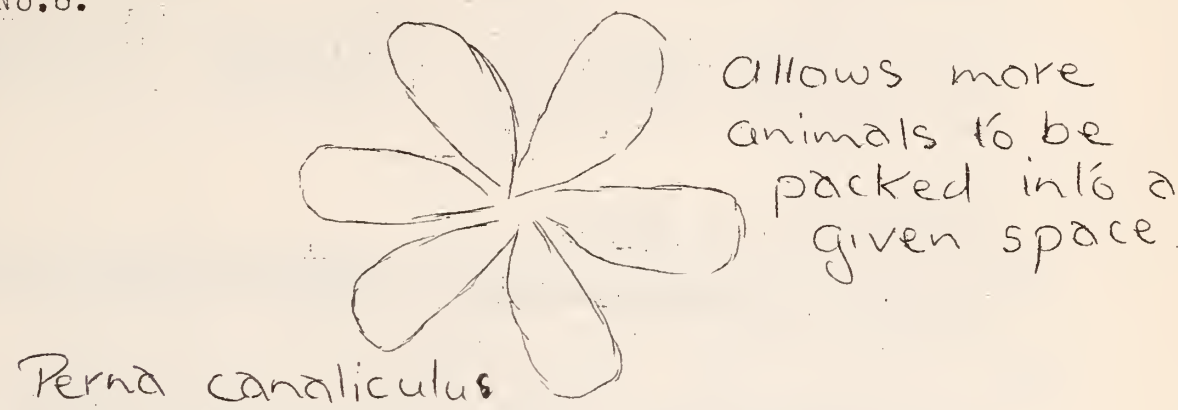


A primitive condition

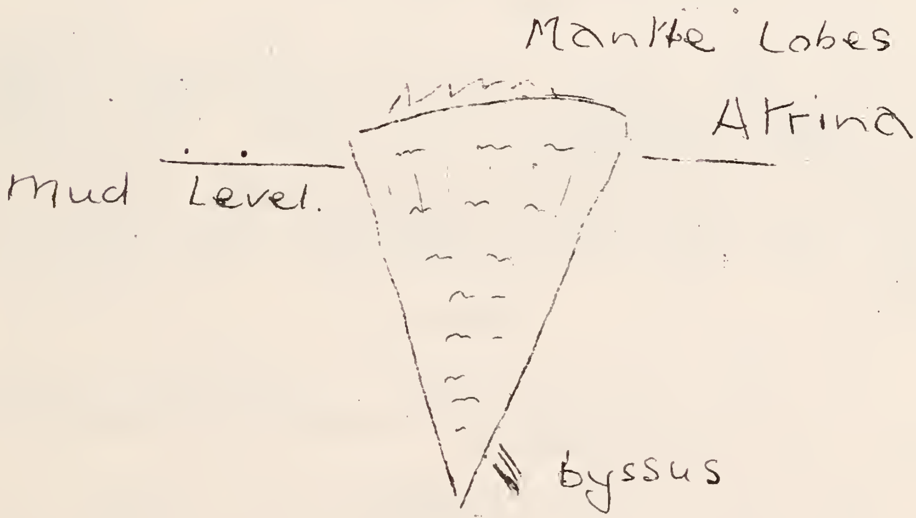
<u>The History of the Byssus</u>

In Rochefortula reniformis the byssus is in the centre of the shell.

No.6.



In the mussel it lies to one end leaving the 'business' end of the animal free. This is useful in the economy of space on the shore.



There has also been a reduction of the anterior end as is seen in Atrina.

--oOo--

NOTES OF INTEREST.

N.Gardner.

Agnewia tritoniformis

While numbers of this mollusc have been collected at Whangaparaoa during our various field days, no other record closer to Auckland has hitherto been known . Just recently a fine and very large shell was collected at Beachlands.

--oOo--

Introduced Land Snails :-

Miss B. Elliot has a number of the introduced Vallonia excentrica (Sterki) from river beach drift at East Takaka.

--oOo--

During Toheroa survey operations on Ninety-Mile Beach, Mr.E.Willis did some collecting at Manganui Bluff. Perhaps one of his most interesting finds was a squat form of Comenella virgata - low spired and tumid.

--oOo--

From Mrs Giffney :-

"The fishermen brought in to me some time ago a piece of spongy stuff which I think might be Siliquaria maoria. I managed to get some whole ones out, but most were badly damaged. It comes from deep water well outside the Farewell Spit ---" (Yes, this was the more rare growth. This shell was illustrated in a previous 'Poirieria'.).

From Mrs.R.Mathews of Opua :-

I have been discovering that fish gut produces some species of rarer shells. By this means she has secured quite a number of the nice bivalve, Scalpomactra scalpellum. The late Mr. G.Williams of Tauranga used this method to good advantage and secured a large list of species, among them quite a number of new ones. The fish he considered worth while were Terekihi and Porae.

--oOo--

The Drawings in this issue of Poirieria were all drawn by Mr. Norm Gardner.

--oOo--

Vol.2. Part 4. February 1965.

LORD HOWE ...... ISLE OF PALMS.

Laurie Price.

Lord Howe Island is situated some 420 miles to the north-east of Sydney, and is administered as a part of New South Wales, Australia. It is a small crescent-shaped island, roughly 7 miles long by half a mile wide, the southern end consisting of two solid mountains, Mt.Lidgbird, 2504' and Mt.Gower, 2840'. Most of the lowlands are covered with dense palm groves while the higher ground carries thick evergreen forest.

In ages past, the island was possibly connected with New Zealand and several other groups to the north-east. This is indicated, not only by the presence of the large land snail, Placostylus, but by the striking similarity of some species of birds and plant-life. However, Lord Howe is chiefly noted for having the world's southern-most coral reef....... an out-lying part of the Great Barrier Reef of Queensland.

Formerly, the residents' main occupation was the world-wide sale of palm seeds, from the four endemic species. Today tourists are the mainstay of the nine guest houses on the island. Apart from an occasional cargo ship, all freight and passengers to and fro are handled by a twice weekly flying-boat, based at Sydney,

For such a small island, Lord Howe has a very rich land snail fauna, ranging in size from the large Placostylus, to the minute forms of Paralaoma, and numbering at least 75 species. Quite a few collections have been made in the past, the most up-to-date account of the specimens being given in " The Land Mollusca of Lord Howe Island", issued in 1944, by Mr. Tom Iredale of the Australian Museum.

During 1963, I was fortunate in obtaining a grant for the purpose of travelling to the island, and making an extensive collection of the small land snails for the Chicago Natural History Museum. The specimens were to be gathered alive, wherever possible, and preserved in alcohol. Thence they were to be despatched to Dr.Solem of Chicago, who is currently working on the "Endodontids" of the Pacific region.

Thus, early in September, 1963, saw me stepping ashore on this lovely island, where I was soon installed in the nearest guest house .... "Ocean View". So keen was I to get going, that, after a fast change, I took a stroll down the lane and dived into a palm grove for a quick look ! Next morning I hired a bicycle from the guest house and was away ..... pedalling furiously. During the next few weeks I was a familiar sight on the island roads and tracks, and was sometimes mistaken for one of the locals, by newly arrived tourists.

At this time of the year the weather is cool and showery, providing excellent ground conditions for picking up small snails. The most prolific spots for them is under dead wood and stones, but after heavy rain, dozens of the specimens can be seen, crawling around on the underside of fallen palm and pandanus leaves. Among the small types of snails the most abundant are the many varieties of Diplommatinidae....... tiny, sinistral, Pupoid-shaped shells. These are found everywhere, from near sea level to the tops of the mountains. Also plentiful are several species each of the operculate Realiidae; the thin, glassy Nitoridae; and the slug-like Helicarionidae.

Mts.Lidgbird and Gower, ever dominant on the island scene, are two great blocks of volcanic basalt, connected by a 1000' saddle. Their tops are often wreathed in cloud, thus providing abundant moisture, and their higher slopes are covered with a thick growth of palms, stunted trees, ferns and moss. This is the favourite haunt of the Charopidae and it's allies. I spent a good deal of time scrambling around these mountain slopes, in company with a motley collection of wild goats. Due to a series of vertical rock faces, I didn't quite make the summit of Mt.Lidgbird. However Mt.Gower is slightly easier, and I was able to make a good search of the plateau on top.

Scattered plentifully over the lowlands are bleached remains of Placostylus. In many areas, these are constantly being buried and exposed again by mutton-birds burrowing in the sandy soil. I found a single recently-dead specimen, but though I kept a sharp lookout, not one living shell could be seen. Rats arrived ashore from one of the early shipwrecks, became widespread, and today are probably the cause of the near extinction of these fine shells.

The endemic marine species include one limpet, several Siphonarias, a Haliotis, and several bivalves. Most of the remaining seashells are similar to species found on the Great Barrier Reef and adjacent seas.

Altogether I spent five weeks on Lord Howe, and although it was one of the most strenuous collecting trips in my experience I simply did not wish to leave. So friendly were the people, so pleasant and peaceful was the island, that I would have been happy to stay on indefinitely! However, on October 19th, I boarded the flying boat and said farewell to this Pacific gem.

--oOo--

HERE AND THERE.

Tourists sightseeing at the Lighthouse at Cape Reinga in the Far North, can purchase a souvenir for the occasion - specimens of Placostylus ambagiosus priscus which have been collected from the sand dunes at Cape Maria, several miles away. These shells are suitably franked with a rubber stamp and sell at 5/- each, or if you prefer unstamped specimens - 1/6 each.

With a supply of hundreds upon hundreds of these subrecent snaill shells available for the picking up, this should be a very profitable enterprise!!

--oOo--

From Mrs.Mitchener, Great Barrier.

"Shelling has been very much at a standstill, very few opportunities for beachcombing and a great paucity of material on our local beaches. The only find was an excellent specimen of Cabestana waterhousei - my first and the only one found so far by local collectors".

--oOo--

To Dr.Powell's list of records for the N.S.W.Cassid - Xenogalea thomsoni, (in his recent paper mentioned under new Publications) we can report the finding of a further example during the Xmas holiday. This is a small, thick heavy specimen which was washed up at

Great Exhibition Bay and is now in the collection of Warren Judd.

--oOo--

Mr.J.Walker, looking through washed up shells near high tide mark at Cape Maria recently, asked " Is this one any good ?" And what was it ? -- only a beautiful, large Mammilla simiae!

--oOo--

Also picked up at this spot (by the writer) was a Globisinum drewi, rather a rarity as a washup. Several others have been collected from this beach in the past.

--oOo--

Miss J. Coles collected a very nice Cabestana waterhousei at Weymouth on the Manakau Harbour.

--oOo--

Mr.K.Hipkins, who holidayed at Whangaroa again, secured a further fine lot of Pteronotus eos from intertidal rocks, but was not able to do any dredging this time.

--oOo--

Exomilopsis hipkinsi Powell

Already a further specimen of this recently described shell has turned up - this in the Turner collection - from shell sand at Cape Maria. This specimen is a 9 mm in length and is the third known specimen.

--oOo--

Speaking of Mammilla simiae, more specimens seem to be turning up these days. Besides Mr.Walker's find we know of three or four other examples found about the same time - one from Great Exhibition Bay, one from Merita, Doubtless Bay and another from the coast opposite Cavalli Islands.

--oOo--

The cutting and running off of thr stencils for all issues of "Poirieria" to date have been done by Mrs Seager - quite apart from her other Club activities. The Editors would like to record their appreciation of this willing assistance. It has taken a lot of her spare time. We were floored recently, however, for on handing her a sizable bundle of articles for one issue and thinking 'That will keep her busy for three months' we were immediatelyasked ' how soon could she have the next one !

Incidentally Mrs Seager has again helped us with this issue.

REEF POINT, AHIPARA.

Norm.Gardner.

Although Reef Point is somewhat off the beaten track it is quite well known to conchologists as a place where our small very local *Ellatrivia memorata* washes up fairly frequently.

To reach this 'shell beach' as it is called entails a walk of some five or six miles along a shore line of low rocky reef, interspaced with small stretches of loose sand and shingle. It is an area well known to the local Maoris as being rich in sea-eggs and paua, and they often go after these prized foods: so, if you happen to be tramping in the right direction at the right time, you'll be offered a lift in the 'bomb' of one of these carefree parties - as we were.

Our conveyance in this instance was a light truck of almost vintage model, and the experience of bumping over the ridges of rock, zigzagging across the areas of loose sand in low gear - motor revving at absolute max., was really something !

Our burly driver volunteered the information that it was somwaht hard on the clutch - rather an understatement, we felt !

Our benefactors eventually stopped at their favourite hunting area and gave us full directions for getting to the shell beach which was about $\frac{3}{4}$ mile past the limit for vehicles.

The beach is at the head of a 'Bight' in the large area of reef, which makes a very effective trap for shells and general debris. This piles up several feet high, but as is usual in such situations the shells are rather worn.

Although we were primarily interested in securing a supply of shell sand from which to sort out microscopic specimens, we did spend an hour or so looking for larger shells and the results showed that this is an area of considerable promise. For our short period of beach combing we had amongst other things, 9 *Ellatrivia memorata*, 3 *Vicimitra maoria*, 4 *Phillipia lutea*, 2 *Maoricrypta youngi*, 3 *Zeacolpus ahiparanus*.

2 Pervicacia flexicostata, 3 Pupa alba, and numerous very large Tugali s.bascauda.

Perhaps the most interesting find was Paratrophon cheesmani which is quite common there. Previously, we had seen specimens only from the Auckland West Coast as far north as Muriwai.

It is certainly a place worth some intensive collecting - plenty of rock pools and interesting ledges exposed at low tide.

--oOo--

SEA SHELLS SELL WEIRDLY AT SUVA.

(A newspaper cutting which was handed in recently).

Not only unsuspecting tourists are sometimes paying exorbitant prices for local sea shells at Suva.

Local shell collectors have to pay almost as much to complete or add to their collections.

A trip round the Suva Market yesterday revealed the top rpice, for a pair of whelks - one with a right-hand aperture and the other with a left aperture, as £30.

Though such a set is not common, the price was far in excess of their value, a shell collector said.

Top price for a single shell, a rare 5" long auratus cone of a pale red-brown shade was £25.

But it is not the prices of rare shells that are causing concern. Some of the commonest shells on the beaches, reefs and islands near Suva, are fetching as much as £1/10/-. With a little time and effort any amateur collector could find many of them for himself.

The commonest variety of cowrie, the tiger, was fetching £1/5/- at some stalls, while other stalls were selling them for 2/- each.

A Fiji Times reporter who wanted a deer cowrie after looking at some priced at £1/5/- eventually found the same shell for 1/6 on another stall.

Some stallholders were selling damaged or imperfect shells, which are useless to the collector for prices between 25/- and £2/-/-.

A map cowrie which was damaged and worthless, was priced at 25/-.

THREE PRICES.

A shell of a poisonous fish, a 5" long Geography cone, which is a deep purple colour was selling at 1/10/- at one stall, 14/6 at another, and 7/6 at a third.

Tiny shells, no larger than a finger nail, such as cribraria cowrie, were selling at 1/5/- and 1/10/- yet a shell expert managed to get one for 11/6 ataanother stall yesterday.

A strombus priced at 1/5/- was shown to the reporter the stallholder explaining that it was a real bargain, because he had sold one during the Pacific Games for £7/10/-. A dark aulicus cone on his stall was sold for £7/10/-.

Textile cones, which are marked with small tent-like triangles and are poisonous, are common in Fiji waters, yet they are fetching £2/10/- at some stalls.

A small tesselate cone fetched 2/10/- and a top cone was £4/-/-.

Prices for the spider and scorpion conch shells varied from 5/-/-and £2/10/- for perfectly formed specimens to 1/- for immature or chipped shells at other stalls.

An ornage mouthed spider was 2/10/- at one stall, but a Fijiian stallholder, included one free - he admitted it was immature - with a parcel of shells for 5/6.

The larger, more common conch, or triton, often used for making lamps, was a much as £4 or £5.

They can be found quite easily along many parts of the reef.

A giant tun shell was £3/10/- - a partridge tun 8/6, and fig shell £1 at several stalls, but a partridge tun was eventually purchased from another stall for 1/6.

A tonna sulcosa at £5 made a shell collector shudder. The price was "Far too high" she said.

Spiny murex shells are being offered for 1/10/- at some stalls and 5/- on others.

An interesting looking smooth purple shell, like a cowry, is on sale at most stalls for anything between 5/- and 10/-.

It is one of the commonest of Fiji shells. The top layer has been burnt off with acid, leaving a purple surface. Some stallholders are selling at as a " bargain shell, very rare in Fiji".
There is no uniformity of price.

A stall may have prices 50% cheaper than a stall 3 feet away, but tourists and even loocal people have no way of knowing this.

Though some stallholders are conniosseurs of shells they often overcharge the unsuspecting.

On the other hand, many Fijian stallholders who know nothing about the relative values of certain shells, are selling shells at mubh below their true value.
This enables the shell collector, with a little hunting to get excellent value.

--oOo--

NEW PUBLICATIONS .

Records of Auck.Museum. Vol.6. No.1. (Dec,1964) contains a further paper by Dr. Powell entitled "New Zealand Molluscan Systematics with Descriptions of New Species, Part4."

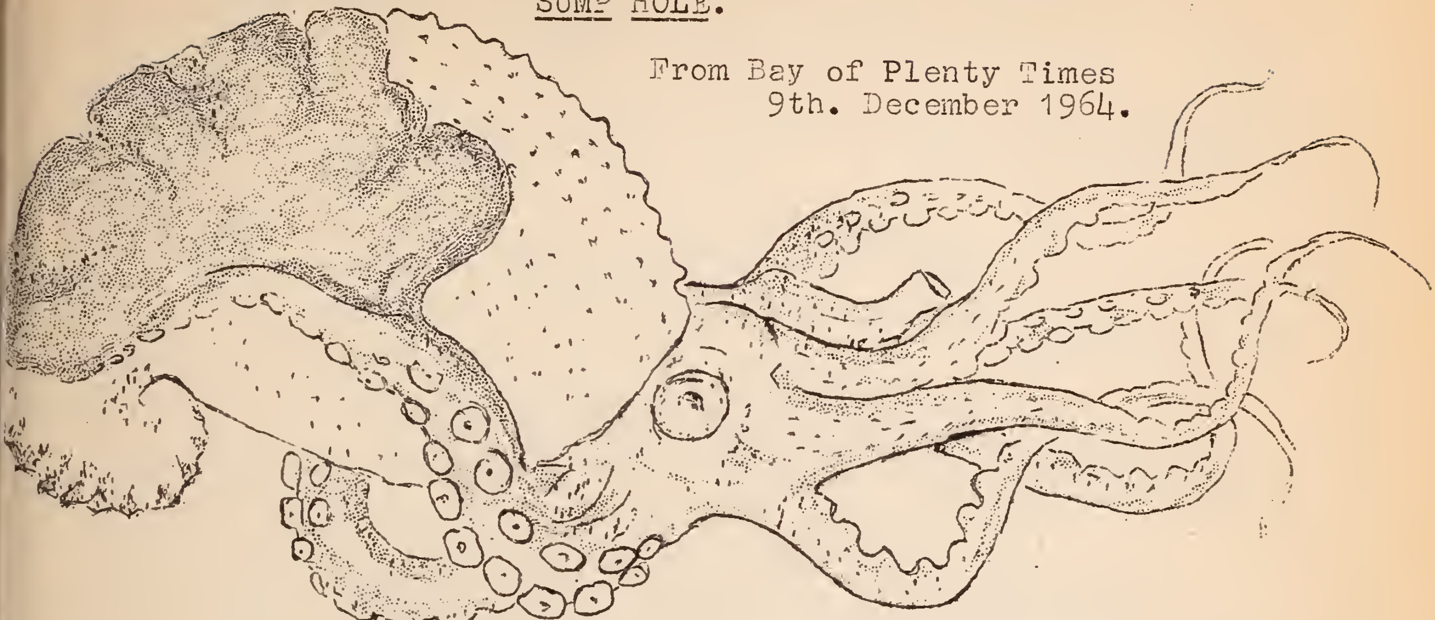
Abstract :- " In this part, two new species of N.Z. mollusca are described - Maurea turnerarum and Exomilopsis hipkinsi, the latter as type for a new genus. Two other species, Limulatys reliquus Iredale, 1936, and Xenophalium (Xenogalea) thomsoni (Brazier,1875) make new records for the N.Z. fauna.

Still another record of an exotic species, Tempetasus liberatus (Pease,1865) requires confirmation before an admittance as a true member of the fauna. The remained of the paper deals with other records of exotic species, most without legitimate claim for inclusion in the N.Z. fauna, and finally two items concerning rectifications of nomenclature."

--oOo--

DISCARDED NAUTILUS EGGS HATCHING IN GARDEN SUMP HOLE.

From Bay of Plenty Times
9th. December 1964.



Eggs from paper nautilus shells collected more than three weeks ago by Tauranga big game launch skipper Mr.R.B.Gray, have produced tiny nautilus fry.

The discovery was made yesterday by Mr.Gray when he noticed a sump hole on his property where water used for cleaning the inside of the nautilus shells had been thrown - was teeming with tiny nautilus. He immediately contacted Mr.K.Fraser, District Inspector of Fisheries.

Samples of the nautilus fry will be sent to Professor J. Morton of Auckland University, one of New Zealand's leading zoologists.

When informed of the discovery by Mr. Fraser yesterday, Professor Morton showed immediate interest and requested that efforts be made to keep the nautilus alive.

Mrs Gray explained that when she was cleaning the eggs and sand from inside the shells, she had thrown the dirty water in the sump to avoid blocking household drains.

" The eggs were quite small and dry and appeared quite lifeless" she said.

Now nearly a moth later, thousands of the eggs have hatched. They have lived during that time in an open sump, in water far less salty than the sea, and without any apparent source of food.

The nautilus range in length from about 1/16 inch to about one inch and are almost transparent. They have featureless elongated bodies and a relatively long thin tail. Under a magnifying glass they appear to propel themselves by pumping water through their bodies in the fashion of squid.

The nautilus is a member of the squid family and the female develops a delicate embossed shell which is highly prized by collectors through out the world.

The species is peculiar to New Zealand and has been found only at Mayor Island, Great Barrier Island, and to a lesser extent, in the Marlborough Sounds.

Mr.Gray, who collected between four and five thousand shells in two recent "runs" at Mayor Island, said the body of the squid was contained inside the shell with the tentacles complete with "suckers" projecting. One tentacle was always hooked in the apex of the shell, presumably to act as an anchor , he said.

Mr.Gray said that it was originally believed that the nautilus were blown on the beaches where the squid left the shell, leaving the eggs to germinate.

" But last time we saw the nautilus they actually propelled themselves through the water on their way to the beach. They could also submerge and surface at will."

He said the nautilus appeared to propel themselves by squirting a jet of water out. Many times the squids squirted water, and sometimes an inky substance, when he picked them up on the beach.

He had formed the theory that the nautilus reached the beach on a high spring tide, the eggs germinated on the warm sand and the newly hatched nautilus returned to the sea on the next high tide.

It was once thought that the shells only "ran" once in about 13 years, but it now appeared to be more often than that, said Mr.Gray. The last run had been only four years ago.

"Snapper and kingfish have been less plentiful in Mayor Island waters this year. Maybe that has sone bearing." he said.

The following article is from the Conchologists Newsletter (The Conchological Society of Great Britain & Ireland) and acknowledgement is made to this paper and the author.

SYSTEMATICS SEWN UP.

T.E.Crowley.

We all know who it was made the very controversial remark that

"That which we call a rose
By any other name would smell as sweet",

and it is possible that the lines were written with a certain amount of personal feeling, since the indications are that Shakespeare had far more trouble naming his plays than writing them; where it is not possible to bestow on the play the name of its principal character, you will note that the titles are uninspired to the point of helplessness.

Beware therefore if, as a lesser mortal than Shakespeare, (I hope I write without overmuch presumption), the duty devolves upon you to name a shell; for the pitfalls are many and almost the whole of the subject of systematics consists of investigating the reasons why scientists should not have named animals and plants as they did. Once a name is in print it may not be ignored but however frivolously conceived, unless it can be proved to run counter to the Rules of Nomenclature, it must be entered permanently upon the synonymy of the creatures to which it is meant to apply. Undoubtedly in the past (and even, regrettably enough in fairly recent times), there have been scientists with a most irresponsible attitude to the naming of shells - and, no doubt, of other creatures as well. Species have been described on the evidence of a single beach-worn valve, even on nothing but an operculum, but the main pitfalls and gins which beset our paths are perhaps provided by the zoologists who have seized upon chance small variations , usually in an inherently variable group, and given them new names. It is not truly possible to give a specific name to a shell, with any honest conviction that the name is correctly applied, unless one has seen such a collection of specimens from various localities that one can be sure of, and can describe or figure, the full range of variation of the newly suggested species. Only if the thing is utterly and obviously different from all known forms may one dare to describe it on the basis of one or two specimens, leaving (rather unhappily) an assessment of the reasonable variability of the species to be assessed by someone when more examples of the thing turn up. Neither a splitter nor a lumper be, but let shells, in sufficient quantity, speak for themselves.

One conchologist, in reviewing a few melanid snails obtained from Lake Nyasa in the early days, ascribed them to about forty species divided among four genera which he described as new. Most of the shells were just slight variations of normal forms, and there are certainly not more than six species, all in the genus Melanoides.

One hopes that one day a brave worker will resolve to revise and monograph the family Thiaridae in which these shells occur; when such a star arises on the conchological horizon he will, on the conclusion of his work, deserve some scientific equivalent of the George Cross, for true it is that the conclusions of most of those who have laboured on this (and many other) family, provide little help to the man who now attempts to put things in order, but rather they have, by the very energy of their over hasty conclusions, made his task difficult as to be well-nigh hopeless.

Perhaps you believe that your new shell belongs to some genus which has not yet been described; be advised, try and get somebody a long way off, whom you do not know very well, to undertake the work. A great many genera have been described in the animal kingdon - certainly over a million, I imagine - and if your name has been used once before, for whatever kind of creature, then your name is invalid. There are lists of course, but they take a great deal of going through before you can be sure of yourself, remembering always, that there are those who do go through them for the academic pleasure of pointing out scientists' mistakes in such matters. The South American snail subgenus Microborus, as readers of the Journal of Conchology will know, recently had to be renamed Austroborus, as the name was previously bestowed on a beetle. The well known genus Cerastua, and Sarama Godwin-Austin 1908, preoccupied by a Pyralid, was renamed

Rasama by Laidlaw. Examples are commoner than you might think.

What you may do to avoid this trap is to think up a name so horrible in its ingenuity that you may be morally certain that nobody else could have ever have used it before. The result is however, unlikely to be euphonious. Kerkophorus, Limacolariopsis, etc. belong to this category, and I think, even Scrobs, while the excrutiating Halolimnohelix is certainly unlikely to have been given to anything but a snail with an inferiority complex.

Another fairly safe thing you can do is to invent a name of your own, not derived from Latin nor any other language, and which neither means, nor is intended to mean, anything at all. There is no objection to this. Clanculus, for instance, is an honourable example, and Vanikoro, which is supposed to have been inspired by some native word, and is hence classified as 'barbarous'.

Perhaps it is merely a species which you wish to name, and in certain ways your task this time is easier. You must be quite sure that an identical name has not been given to any other species within the genus, and that your proposal cannot offend any personal, moral or religious susceptibilities; jehoveh for instance, has been rejected. It may strike you at first glance that the names given to shells are in Latin - in fact you may have heard some speak respectfully of the 'latin names'. In actual fact this is not so; many names are horrible mongrels of latin and greek. No objection can be raised to names in any other languages such as arabic for instance (asghar Biggs) and others, by employing the names of deserving scientists with unsuitable patronymics, nod haughtily at the latin usage by adding a letter or two at the end to reach agreement in gender with the generic name. As examples I give you macgillivrayi and milne-edwardsi. Few Romans would recognise such flights of fancy, and when it comes to desmoulinsiana or deslongchampsia, I am uncertain whether to pronounce them in latin or in their native tongue . I cannot recollect anybody naming a species after Tapparone-Canefri, Moquin-Tandon or Della Chiaje.

Such tongue twisters are necessarily frequent, and goodness knows how many people have been put off the study of zoology by them. They engender a suspicious attitude at least in my own obstinately perverse type of mind, which persists in considering even the honest latin name Ena montana more likely to refer to a female American film star than to a snail; I would however, be the first to admit that the reverse would certainly be true of Ena obscura. When condronted with Aoteadrillia wanganuiensis Hutton or Axymene waipipicola (Webster) the mind refuses to function further. I am waiting for a valid species of the genus Helix to turn up in the hope that some young scientist may happily bestow upon it the good latin appendage felix.

Many will no doubt consider all this an egregiously frivolous attitude to the learned science of systematics, but I must repeat that cavalier treatment is by no means rare. It was Iredale for instance, perhaps because he had temporarily run out of names, and wishing to pay tribute to his wife, who named a shell berylsma; another rather stunted little holotype became possessed of the label pooretchia. Beware, however; as you probably know, there is an International Commission on Nomenclature which sits on these things; and although some have expre ssed their opinion that it does not sit hard enough, it does have its limits. As Mayr points out in the standard work on the subject, names impossible of pronounciation such as Aaages or Zyzzyra, or which sound identical when pronounced (as cocana and kokoana of Kearfott 1907), or which are merely saucy such as Polychisma, Peggychisme and Nanichisma (Kirkaldy,1904) are not to be regarded as sufficiently responsible to uphold the reputation of zoology among the sciences. For a similar reason the Commission, taking a deep breath, threw out Cancelloidokytodermogammarus (Loveninskytodermgammarus) loveni Dybowsky 1926. Luckily, these last few examples were not culled from the phylum Mollusca.

Suppose you new Pisidium or what-not is slightly larger and rougher than any known before. You could call it maximus or collossus or spinissimus and the name would probably be valid, but think of the difficulties you bequeath to a successor, p ossibly not born et, who finds a larger and more prickly species still, and who has by you been denied the use of any superlatives. Your shell may be the first to come from China perhaps, or Japan, and sinensis or japonicus might be excellent trivial names but for the possibility that a dozen more species may yet be discovered from the same areas, none of them more or less 'japonicus' than yours. Lots of creatures have in fact, been named after New Zealand, for instance, but the latinised forms of this delightful country bring to mind the devil in being legion. They include novaezelandiae, neozelanicus, zelandica, zeelandona, zelandiae, novozelandica, zealandicus, novozealandica, and novoseelandica among the molluscs alone.

It may occur to you if you have read this far, that the field for naming shells is not as wide as might have been thought; or alternatively that I am presenting the situation in a mood of disenchantment. How then, you are entitled to ask, can we safely and effectively name our new discoveries ? This in fact, I am quite unable to tell you. Perhaps after all it was a good idea of Bourguignat's to name species after his friends' daughters, just because they were beautiful girls; for myself, it may yet come about that I shall have a shell or two to name during the rest of my conchological career, and I have no ideas in store for these, let alone any to throw away on other people. It might be for me, a fine idea to name my next shell munchauseni - at least I should be sure of somebody quickly and automatically relegating it to the synonymy

--oOo--

Vol.2. Part 5. June 1965.

DREDGING AT KAWAU ISLAND

Mrs.Otto.

During the third week in February 1965 I stayed at Algies Beach with my Sister and Brother-in-Law. Every time we went fishing my dredge was used as an anchor, and the contents emptied into a bucket for me to sieve on shore, much to the amusement of passers by !

Unfortunately the weather was not very good and so most of the material I got was from between Mullet Point and Algies Bay in 3½ to 4½ fathoms, except for one dredgeful which came from the channel between Goat Island and Mansion House Bay in 5 fathoms. This contained soft "oozy" mud and in it I found One large, two very small and three half Notocallista multistriata, 2 Nemocardium pulchellum, several Zeacolpus pagoda, many Pleuromeris zelandica, a single Tellinella eugonia, Leptomya retiaria, Emarginula striatula (dead), Cominella quoyana and a half Cuspidaria fairchildi.

All the material from the coastline in 3½ fathoms consisted of a little muddy sand and a great deal of dead and broken shell. In it I found many Zegalerus tenuis, Neoguraleus species, Baryspira novaezelandiae, Nucula nitidula and hartvigiana, Pleuromeris zelandica, Zeacolpus pagoda and Epitonium philippinarum (dead). Less common were Cominella quoyana, Nemocardium pulchellum, Baryspira australis, Chemnitzia sp., Resania lanceolata (small), Notocorbula zelandica and one dead Phenatoma.

In 4½ fathoms a little further off shore, a little more mud was present, but still plenty of broken shell, coral and sand tube worms. The common shells in this area were as in the 3½ fathoms area with the addition of Venericardia purpurata, Tawera spissa, Notocorbula zelandica and Cominella quoyana. Less common were Myadora striata, Cylichna thetidis, Baryspira novaezelandiae, Nemocardium pulchellum, Zemyllita stowei and juvenile scallops and Glycymeris. In small numbers or single specimens, were Notosinister ampullus, Neoguraleus murdochi, Neoguraleus interruptus, Murexsul mariae, Gari stangeri, dead Epitoniums, Xymenella pusilla, Diplodonta zelandica, Soletellina siliqua, Hunkydora australica transenna, Aoteadrillia rawitiensis, Daphnella cancellata, Cadulus ?, one dead Trichosirius inornatus and one dead Emarginula striatula. There were many very small specimens of Turritellidae and Neoguraleus that I haven't been able to identify, and among the very small shells kindly identified by Mr. Gardner were :-

Zemitrella chaova.	Marginella aoteana.
Gumina dolichostoma.	Dardanula limbata.
Arthritica bifurca.	Maoritomella albula.

Nozeba coulthardi.	Xymenella pusilla.
Peculator hedleyi.	Zebittium exile.
Marginella larochei.	Proxiuber australis.
Dardanula olivacea.	Rissoina fucosa.
Agatha georgiana.	Rissoina achatina.
Estea zosterophila.	Notosiella tereebelloides.

These additional items were also secured from dredged material during the Section's Weekend at Kawau in October -

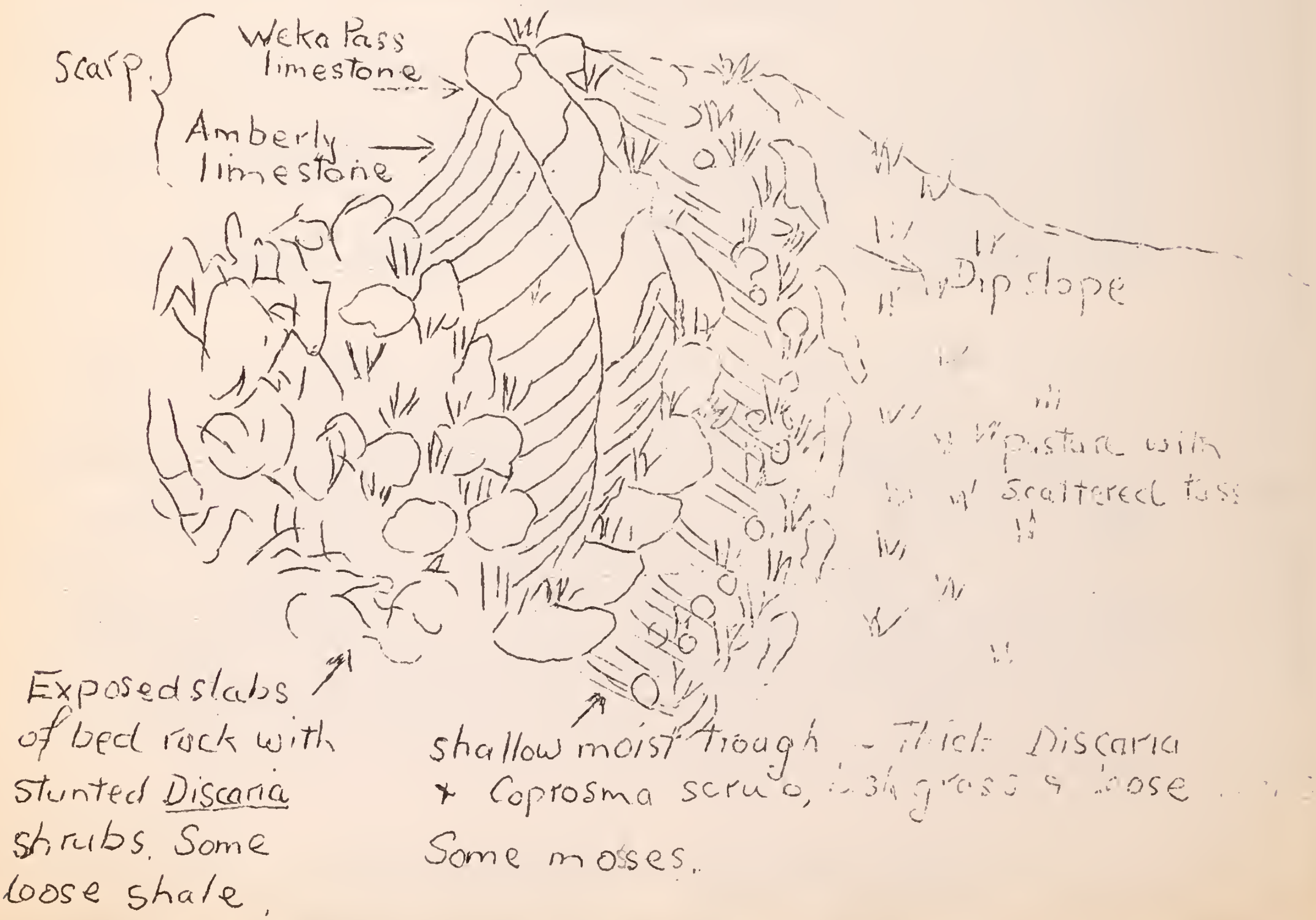
Melliteryx parva.	Nucula [illegible]
Antisolarium egenum.	Marginella larochei.
Liratilia larochei.	

--oOo--

THE HABITAT OF SOME SMALL SOUTHERN SHELLS.

Fr[illegible].

I've struck very fruitful shelling ground lately Geologically speaking, these rich areas are the outcrops formed by the tilted Weka Pass and Amberly limestone series. Molluscs are very abundant here in a variety of environments which I'll try to portray below.



Distinct species of snails appear to be most abundant in particular areas.

1. Therasia thaisa
   In long grass around the edges of rocks - very common.

2. On the dipslope edge of the exposed slabs of rock near the scarp edge. Where the Discaria or Coprosma lives on the rock, the snails were found in the foliage. (Therasia thaisa).

3. Under thin slabs of limestone (3" - 6") in depressions among the exposed slabs of limestone - very exposed and the only vegetation is short grass (2"). (Probably the introduced Vallonia pulchella)

The area 1 and 2, were from the middle Waipara Gorge. Area 3 (not very obvious at Waipara) was present on the same series of limestone at Weka Pass. (Further North by about 8 miles).

4. This same limestone series is exposed as a vertically tilted razorback ridge about 1½ miles west of Broken River. Broken River is between Porteus and Arthur's Pass. The type of shell found in area 1 is found at this Broken River locality but the specimens are much smaller here. Under loose slabs of rock at Broken River is the snail Phrixgnathus haasti.

--oOo--

EXTRACTS FROM BEVERLEY ELLIOTT'S LETTER

Several years ago, Beverley Elliott and Frank Climo came across some very dead specimens of a strange tiny, rather globose fresh water univalve along the edge of a creek at Takaka.

These specimens were shuttled back and forth with no one venturing a definite opinion. Then Beverley came across numerous specimens in beach drift along the river's edge. Just recently we had this communication from her :-

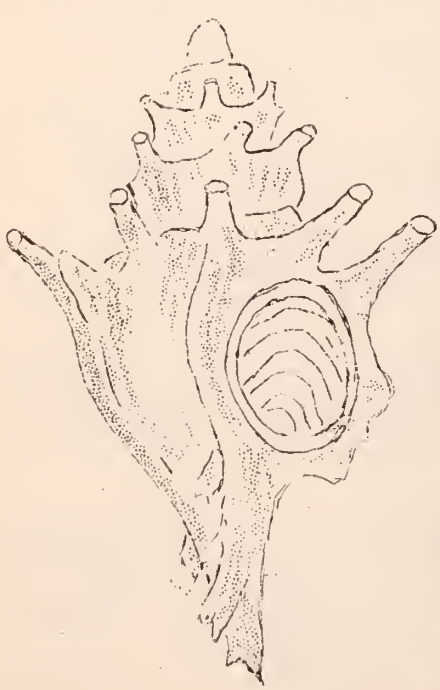
" Yes, I have found live specimens of the mystery freshwater snail. At Dr. Dell's suggestion, I sent half a dozen up to Mr. Ponder, and I got a letter from him this morning. He says they are certainly a new species, and they are the first undoubted record of a subterranean species from New Zealand. He thinks they are Potamopyrgus, but has not yet mounted the radula. When I first thought they might live underground, I thought it was rather a far-fetched idea, and was very surprised and thrilled to find out I was right. I don't know whether I'll ever collect any more though, as it is the most nightmarish place I've ever been in, and even the experienced speleologists with me agreed that it was one of the most awe-inspiring caves they've been in. Until February, nobody had ever been very far in the Gorge Creek Cave, as a waterfall, not far inside, blocked the way. In February members of the Nelson Speleological Society found a way past the waterfall, and told us of the wonderful cave beyond it. That day, I found dead specimens of my little snail inside the entrance of the cave, and could hardly wait for March 13th., when the Speleos came back for another exploration of the cave. I was determined to go with them, although if I'd known what it was going to be like - - - - - - !!!!! It was worth it though, to find my little snails alive. They were approximately a mile from the entrance - that's not my estimation, as I lost all sense of distance under there. "

--oOo--

OUR TYPHIS

N. Gardner.

As you have thumbed down our rather megre list of Murex in Dr.Powell's Checklist, you will have come to, and no doubt, paused at Typhis pauperis and wondered what manner of mollusc could deserve such a pathetic sounding name.



This is truly a most attractive little shell, very much like a tiny Poirieria but about $\frac{3}{8}$" long, whitish or pale pink, with one special and prominent characteristic which assigns it to the genus Typhis. This is the construction of the spines - hollow little tubes just like tiny drainpipes. In Poirieria the spines are sharp and solid with a sinus running along the underside.

Typhis is not a shell you are likely to encounter in shore collecting, but rather is it an inhabitant of deep water. Nowhere does it seem to occur with any frequency - just occasional specimens trapped in a dredge or tangled in trawl debris.

All the specimens I have come across have been from material brought up from Bay of Plenty, Hauraki Gulf or Northward and it is certainly one apecies that gets a second look during micro-sorting.

--oOo--

SCENE : SMUGGLERS BAY, WHANGAREI HEADS.

M. Delph.

In the middle of the beach I spied two men in the prostrate position of Mohammedans at prayer (but not facing Mecca), - faces about six inches from the sand. On getting nearer they turned out to be Professor Morton and Dr.Bernard Bowden, equipped with strong lenses discussing one of the minute Foraminifera !

But no doubt of much greater interest to members, was a find of large numbers of live Zethalia - a joy to Professor Morton who needed them for study. I have a number happily established in a tank and already have made a number of observations. As on the beach, they are just below surface, with the black 'plumes' at the sand surface. Placed on the surface with the apex downward, they quickly put out the foot to its full extent and deftly heave themselves over, than at once dig themselves in with short 'plunges', the whole process taking roughly thirty seconds to a minute. Or, the animal may take the opportunity to move to a new place before digging in. They seem to be able to discern another animal before they actually reach it and then stop and dig in.

--oOo--

HOW'S THIS FOR A SHELL STORY.

Mrs.J.Boswell.

While I was gathering a few shells on the Waitarere Beach one day a few weeks back, a Surf Casting Competition was being held between the Levin and Wanganui Clubs.

One Levin member whom I know quite well, said "Now ladies, don't go taking any Toheroas, they are out of season and too small".

Having picked up some live Tuatuas on the way up, I put some on the boot of his car. He immediately pounced on them and told me to put them back, as it was against the law to take Toheroas at that time of the year, and they were also under size. There were a lot of both varieties all along the beach. He calls himself a fisherman, but he did not know the difference between a Tuatua and a Toheroa.

It makes one wonder !

--oOo--

NOTES OF INTEREST.

N. Gardner.

A tube of small land snails taken from Lady Ellice Is. (Hen & Chickens) and sent in by Mrs.Worthy for identification, included numerous species, namely :- Tornatellinops, Elasmias, Therasia ophelia, Laoma celia and the ever present Paralaoma lateumbilicata.

--oOo--

From Mrs.Seager, we learn that Mrs.Walker of Waihau Bay, gathered up to 100 Ellatrivia memorata and a dozen Argonauta during December !!

--oOo--

A further Tonna Maoria has been taken from the Southern end of Tokerau Beach, by Mrs.Boswell, our Wanganui member.

--oOo--

The "rare" Mammilla simiae has devaluated still further, for during Easter, several collectors in the Far North robbed hermit crabs of at least six specimens.

--oOo--

Xenophora apparently occurs not uncommonly on the fishing grounds off Wanganui. Specimens seem to have mainly valves of Glycymeris attached, with a few Dosinia and Pallium.

--oOo--

Mr.Douglas reports the collecting of several/live Nassarius spiratus, on a recent trip to the East Coast of Northland. This is the first record of this shell taken alive in New Zealand, as far as we know

--oOo--

Mrs.Stoneham came back from a Northern trip with some rather rare specimens - a beautiful, large, true specimen of Cabestana bolteniana, Nassarius spiratus, Mammilla simiae and Philippia lutea (Whangarei Heads).

--oOo--

Possibly the most outstanding finds recently have been from the Poor Knights Is. We quote Dr. Powell in his Museum Report.

> " Two outstanding items received, both new to the New Zealand Fauna, were a specimen of Ravitroma belonging to the well known tropical cowrie shell family, and a large species of Polinices, also of tropical affinity. Both were collected and donated by Mr.Palmer of Whangarei, who obtained them whilst skin diving at a depth of 120ft. at Poor Knights".

--oOo--

REARING OF MOLLUSCAN LARVAE

RESEARCH REPORT SURVEY

S.R.Ayling.

A research report published in Volume 1 of 'Advances in Marine Biology', editor F.S.Russell, will interest many of our readers. The report, entitled 'Rearing of Molluscan Larvae' by Vic. L. Loosanoff and Harry C. Davies, is based upon some 20 years of experience and it will undoubtedly form the basis for much future research. A very extensive bibliography, international in scope, makes the report even more valuable.

The summary below is intended only to indicate the field covered, and apologies are made in advance for any inadvertent distortion of the actual report.

Introduction

'Until recently rearing of larvae and juveniles of marine bivalves, on a basis where repeatable results could be expected, was virtually impossible because of the lack of satisfactory, reliable methods. Thus, although culturing of larvae of bivalves was first attempted in the last century, few workers succeeded in rearing them to metamorphosis and, as a rule they were rarely grown beyond early straight hinge stage.

The availibility of such methods would immediately offer the opportunity to study the effects of numerous environmental factors, singly and in combination, upon the growth of larvae, thus helping to determine the physiological requirements of these organisms. It would also offer the means for studying the genetics of bivalves and initiating properly controlled experiments on selective breeding of these molluscs. Moreover, by growing larvae under different conditions their diseases and parasites could be studied and methods for their control developed.

Finally, because the larvae of many species of bivalves are much alike in size and appearance, it was virtually impossible to identify them, with any degree of accuracy, in plankton collections. With the recent development of methods of rearing larvae in the laboratory, however, this difficulty should soon disappear because larvae found in plankton can now be easily and accurately compared with preserved samples and photomicrographs of larvae grown from known parents under controlled conditions'.

The importance of being able to carry out breeding experiments has been mentioned by W.F. Ponder, Tane Vol.10, 1964, "The Freshwater Mollusca of New Zealand", where he says :- 'Modern systematists study shells of whole populations from as many localities as possible to try to gain an idea of the variability seen within one species ...... Breeding experiments, however, are the best test, (e.g. Boray and Mc.Michael, 1961). By breeding different forms under different conditions the range of variability of the species can become deductive rather than inductive.'

Species Studied.

The species studied most intensively were :-

Crassostrea virginica Gmelin (Eastern Oyster)

Mercenaria mercenaria Linné

Ostrea edulis ...... (European Oyster)

while among others the common mussel Mytilus edulis Linné was studied to a lesser degree.

Water treatment

Large diatoms, free swimming crustaceans, gastropods, worms etc., were prevented from entering the larval cultures by filtering all particulate matter larger than 15u (0.015 of a millimetre) in diameter from the water and also by passing the water through ultra violet light. This latter treatment had a marked effect upon the survival rate of the larvae.

Salinity of water.

A salinity similar to the larvaes natural habitat was employed and for the species considered was approximately 27 parts per thousand.

Spawn Conditioning.

If full use is to be made by experimenters of breeding methods it is convenient to have suitable spawn available at all times during the year. This involves conditioning the molluscs to produce spawn at a predetermined, but probably unnatural time. The authors carried out many experiments into these methods and spawn can now be obtained throughout the year. A combination of temperature control and chemical methods have been employed.

Spawn Quality.

Once the techniques had been mastered, the quality of the spawn was not adversely affected by conditioning to any degree. Neither did the age or size of the animal seem to affect the condition or fertility of the spawn.

Oyster Age.

Mature oysters of all ages produced spawn, but the oldest group responded more quickly to stimuli. The age of the three groups considered was as follows:-

Oldest group (9" x 4")	....	between 30-40 yrs.
Marketable group	....	5 - 7 yrs.
Small group	....	approx. 2 yrs.

Oyster Sex and Growth.

The sexes amongst the oldest oyster group seemed to be evenly divided and the ability to grow was maintained throughout life.

Clam Culture.

The culture was established by mixing approximately 30,000 eggs per litre of water and this produced say 15,000 larvae per litre of water. The larvae were left 2 days without food and then collected by screening (44u opening, 325 meshs per inch). They were reared to metamorphosis in 18 days which was probably normal in nature. However, temperature and food are important and the time can vary between 10 and 50 days. Settling, due to uneven larvae development continued for a period of 27 days, although larvae from the same batch and female etc. were used. The reasons for this big difference is not yet known.

Reaction to Foreign Substances.

Bivalve larvae proved very sensitive to traces of certain substances in the water. It is not certain as yet whether the foreign substances directly affect the larvae or whether essential growth promoting substances are first attacked. D.D.T. proved the most toxic, the small quantity of 0.05 parts per million causing nearly total mortality in oysters. However, Lindane, even in a saturated solution of 10 p.p.m. caused little or no mortality and at 5 p.p.m., faster growth was observed.

Metabolities, released by some micro-organisms, especially dinoflagellates, seriously affected adults, eggs and larvae. Again it is suspected that the metabolites removed substances necessary for the larvaes development.

Varying Salinity.

It was found that species varied greatly. i.e. C. virginica can develop and grow to metamorphosis in a much lower salinity than can M. mercenaria.

Turbidity Effects.

Again the effects of turbidity or sediments in the water affected different species to a different degree. Some species were strongly affected by only light concentration of silt.

Food Effect.

The colour of larvae to a large extent depended upon food. It could be changed in some instances in a few hours by a food change. It is obvious from this that colour is not a safe criteria for use in identification of bivalve larvae.

Too large a concentration of food supply resulted in abnormalities developing and also in less rapid growth.

Overcrowding.

Danger from overcrowding in well maintained cultures may not be as acute as once supposed. Nevertheless, overcrowding is undesirable because it decreases the rate of growth of larvae and obviously they are more susceptible to diseases.

Metamorphosis.

In oysters the metamorphosis was clearly terminated by the attachment of the animal, but in some other bivalves it was difficult to determine the precise or approximate moment as it seemed to be a gradual process. Some have both a velum and a foot i.e. they swim or crawl and are termed "Pediveliger". They are able to postpone metamorphosis for hours or even days if conditions are unfavourable. Temperature and both the quantity and quality of food are important details in the process. An increase of temperature quickens the process.

Partial metamorphosis was characterized by the disappearence of the velum, but retention of a functional foot. These crawlers showed another common characteristic, namely a definite narrow band on the shell, which indicated the edge of the prodissoconch or larval shell and the beginning of dissoconch or post larval shell.

Diseases.

Both larvae and juvenile molluscs were found to be retarded in growth and eventually killed by Bacteria, while in the early stages of the authors experiments much mortality was caused by Fungus growth.

Ultra violet light treatment of the water, filtration and other inhibiting chemicals brought about good control of the fungus and bacterial growth and increased the survival rate to as much as 80% in latter experiments.

--oOo--

VISIT TO CHATHAM ISLANDS - January & February 1965.

Capt.F.W.Short.

The Chatham Islands situated about 500 miles East of New Zealand, is a most difficult place to visit owing to lack of transport. I planned for about 3 weeks holiday and got a booking per R.N.Z.A.F. Sunderland from Evans Bay, Wellington on 13th. January 1965. I was booked for the first boat back said to start trading about the third week in January. However, the boat did not leave Waitangi, Chatham Islands until 27th. February and so I was forced to stay 7 weeks. There was nothing I could do about it. The boat only carries 12 passengers and by that time there were over 50 people awaiting passage.

I was mainly concerned with the endemic varieties of the Chathams and those said to be common there but rare in the remainder of New Zealand. My main source of information being Dr.Powell's work on a visit in 1932 and published in Records of Auckland Institute and Museum Vol.1.No.4. Sept. 1933, and also Shells of New Zealand by Dr.Powell.

I stayed at Waitangi where a very long sandy beach was available. I had some long walks here but never got to the end of it. I was first struck by the number of Cookia sulcata Gmelin, alive and dead along the beach. This was easily the most common wash-up. There were no other shells in quantity though I found an occasional Modelia granosa Martyn, some with animals complete, a few dead shells of Cabestana spengleri Perry and odd valves of Anchomasma similis Gray. The foreshore here was flat, with cracks in the floor filled with the mussel Aulacomya maoriana, Iredale. Later I found a large colony of Haliotis iris Gmelin and in smaller numbers Haliotis australis Gmelin. I secured some of these but the Paua (H.iris) were mostly poor shells, being thin with a lot of air spaces.

In this area a Maori and his wife came along collecting Paua. A long pole with two prongs on the end being used and in a very short time they had two buckets full. They gave us one which was taken home for cooking by being minced, and I thought later this method could be improved upon. While there, a Blue Cod of about 5 or 6 lbs came into view and after some skilful work this was also caught on the prongs. With visions of Chlamys I was anxious to see the stomach. The Maori woman opened the fish and I felt something hard in the stomach. It turned out to be the operculum of a Cookia sulcata with about an inch of flesh attached. How the fish got this I do not know, unless it was a dead Cockia or one broken by the gulls as I was told they sometimes take them and drop them on to the rocks.

Shortly after by arrival I had an opportunity to join a picnic party to Port Hutt, said to be about 25 miles. My map showed a road but this developed into tracks and then open country. Eventually we had to leave the Landrovers and after walking about a mile I enquired how much farther and was told about 4 mile. I felt this was too much so I stayed at a nice sandy beach. Nothing here except a few limpets and the tide against me but when the party returned, I found they had secured specimens of Cantharidus opalus cannoni Powell some with animal complete. I later found wash-ups in various places, but hard to get complete. This variety seems well distributed, there being large areas of kelp on the Island for grazing and pieces of shell washed up.

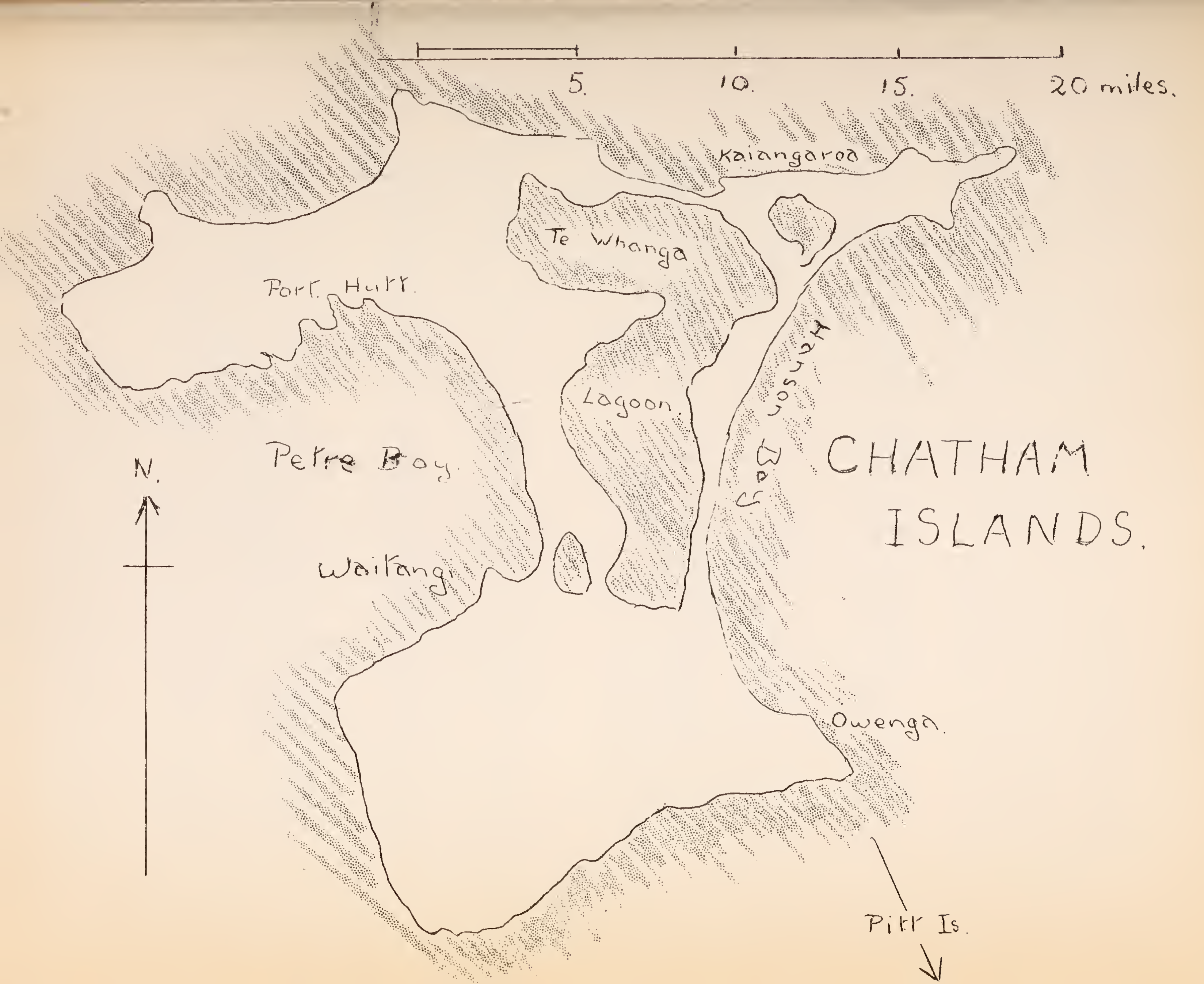
On the way back we had another walk to see an area of Basalt rocks said to resemble those of Giants Causeway in Ireland.

I was particularly keen to collect the endemic Buccinulums - B.waitangiensis Powell, B.characteristicum Finlay, B.biccinctum Hutton (2 colour forms) but practically all I secured were wash-ups. The same applied to Buccinulum marwicki and B.pallidum Finlay.

While hunting at Waitangi a Maori boy became interested and when he found I was collecting shells he went away and came back with a preserving jar with shells cemented on it. The Buccinulums were in evidence and two fine specimens of B.waitangiensis were stuck in the middle of the jar. Most people here seem only interested in decorative work with shells.

Some varieties seem to grow very large here. A very large Argobuccinum tumidum was secured alive. Others noted were Cellana, Rhynella, Melagraphia, Gari lineolata, Barbatia and Austrofusus glans. My first Haliotis virginea morioria Powell was found on Waitangi Beach. I never found them alive or anyone that had.

Owenga, about 14 miles from Waitangi is probably the best collecting area on the Island. My first visit there was only a short one. I was shown over the Freezing Works for fish but at the time it was being overhauled and not working. I had hopes of getting among the Blue Cod which are noted for swallowing Chlamys etc. from


5.
10.
15.
20 miles.
Kaiangaroa
Te Whanga
Port Hutt
Lagoon.
Hanson Bay.
CHATHAM
ISLANDS.
N.
Petre Bay.
Waitangi
Owenga.
Pitt Is.

de_p water. I got some samples of Cellana strigilis chathamensis Pilsbury, which grew to a good size here. They take on different shapes and it is hard to recognise the juveniles as the same variety though it is said there is only the one on Chatham Island. It is recorded that Cellana go foraging and come back to the same spot to live. There were some fine examples at Owenga in which they appeared to live in depressions. One was about ½" deep and would have been impossible to remove with a knife without damage. Needless to say I left them in peace.

There is no public transport so I was dependent on someone with a car for trips to Owenga. The local Doctor and two R.C. Fathers who relieved each other were a great help but as they had business to attend to, my stay was limited.

However some trips were rewarding. At one place a little North of Owenga, vast quantities of shell are banked up and I understand this had been used for roads. It was the only place on the Island I saw shell in quantity, mostly dead and bleached. Among them were Cominella iredalei Finlay, Cominella adspersa Brug, Austrofusus chathamensis Finlay, Lepsithais squamatus Hutton, Austrofusus glans Roeding (very large but all bleached), Gari lineolata Gray, Zeatrophon ambiguus Phillipi, Glycymeris laticostata Q. & G., Dosinia maoriana Oliver etc. etc. A large number of Haliotis iris were on the beach which appeared to have been marketed for the freezer.

Ocean Beach, with a large reef off shore and for some reason, deep water material gets washed up here particularly after stormy weather and after some days of S.E.winds. After such conditions Mrs.I.Prendervillc and I had a chance to hunt there - only a limited time available as our Driver Father Doyle was in a hurry to return. Among items collected alive were 2 Astrea heliotropium Martyn, Modelia granosa Martyn, Argobuccinum tumidum Dunker, Austrofusus chathamensis Finlay, Monia zelandica Gray and a few Gari lineolata Gray.

Among dead shells, mostly damaged were Pachymelon wilsonae Powell (1 about 4/5, 1 juvenile), Xenophalium powelli Finlay, Maurea tigris Gmelin, Maurea punctulata Martyn, Panopea smithae Powell, complete, Chlamys diffenbachi Reeve, in sponge, Cardita aoteana Finlay, Longimactra elongata Q. & G., complete, a single valve of Cyclomactra tristis Reeve and one of Chlamys delicatula Hutton not listed for Chatham Islands. Also many odd valves of Chlamys probably thrown out with cod stomachs from the Freezing Works.

A Sea Leopard about 12 feet long caused some excitement by coming ashore in the mouth of a small tidal river at Waitangi. It appeared to have been badly injured and stayed there until it died and was buried in the sand by a Bulldozer.

I did not enjoy the best of health during my stay and had I been more active I might have done better.

I would like to express my grateful thanks to Mr. & Mrs.D.L. Holmes, Mr. & Mrs. P. Prendervillo, Dr.C.F.Proctales and Fathers O'Connor and Doyle for their kindness and assistance given to me.

--oOo--

P O I R I E R I A.

Vol.2. Part 6. September 1965.

FIELD DAY, TITIRANGI, JUNE 1965.

At 1.30 p.m. on Saturday 20th. June, some 20 odd enthusiasts assembled at Titirangi Beach before moving off into the bush to search for small land snails. The area selected was of a cold coutherly aspect; nevertheless some nice species were taken, including a few items considered to be rarities.

The small whitish aboreal snail Serpho kivi seemed to be unusually common in the area and most members were able to secure a nice series from the leaves on the undergrowth - particularly on Geniostoma (pigwood).

One collector was successful in finding several live Flammulina perdita under the loose bark of larger trees.

Scores and scores of fallen nikau fronds were searched for specimens and these were profitable, as usual. Beautiful, large Allodiscus dimorphus and numerous Liarea hochstetteri carinella, Laoma poecilosticta and Phenacohelix ponsonbyi were living in these.

Several of the strange little Otoconcha slug were found. This mollusc has a small glassy, paua shaped shell embedded in its back and its rather long, slender tail is at times curled along its back, cat fashion.

The lower undergrowth, which was beaten while a cloth was held underneath, gave up numbers of Cytora and Phrixgnathus in the main.

Possibly the most coveted items so far reported from material taken on this outing were Charopa titirangiensis (Suter) and Laoma pirongiaensis Suter - most certainly desirable items, even if the latter grows only up to 2mm.

Species recorded were :-

Cytora hedleyi (Suter)
" pallida (Hutton)
" cytora (Gray)
" torquilla (Suter)
Liarea hochstetteri carinella (L.Pfeiffer)
" egea egea (Gray)
Charopa ochra (Webster)
" titirangiensis (Suter)
" coma coma (Gray)
" anguicula (Reeve)
Ptychodon tau (Pfeiffer)
" pseudoleioda (Suter)
Thalassohelix ziczag (Gould)
" propinqua (Hutton)
Suteria ide (Gray)
Serpho kivi (Gray)

Allodiscus dimorphus (Pfeiffer)
Phenacohelix ponsonbyi (Suter)
" pilula (Reeve)
Flammulina perdita (Hutton)
Flammulina costulata costulata (Hutton)
Flammulina chiron (Gray)
" zebra (Le Guillou)
Fectola buccinella (Reeve)
Paralaoma lateumbilicata (Suter)
Therasia decidua (Pfeiffer)
Therasiella tamora (Hutton)
" celinde (Gray)
Phrixgnathus ariel Hutton
" fulguratus (Suter)

Phrixgnathus celia celia Hutton	Elasmias subperforata (Suter)
" glabriusculus (Pfeiffer)	Tornatellinops novoseelandica (Pfeiffer)
" erigone (Gray)	
" mariae (Gray)	Omphalorissa purchasi (Pfeiffer)
Laoma poecilosticta poecilosticta (Pfeiffer)	
" pirongiaensis Suter	Delos coresia (Gray)
Otoconcha dimidiata (Pfeiffer)	

Ed.

--oOo--

AN UNUSUAL PARASITE.

Adapted from "Brehm's Animal Life"

J.E.Rosenbaum.

In the intestines of certain song-birds - especially such as live near water, and are insectivorous - lives a worm (Urogonimus mageostomus) which belongs to the same family as the liver-fluke.

It's eggs are shed with the birds' droppings and these frequently land on the leaves of plants bordering lakes and streams. Here, an amphibious snail (Succinea amphibia) abounds in places. While feeding on the leaves the snail swallows the worms eggs.

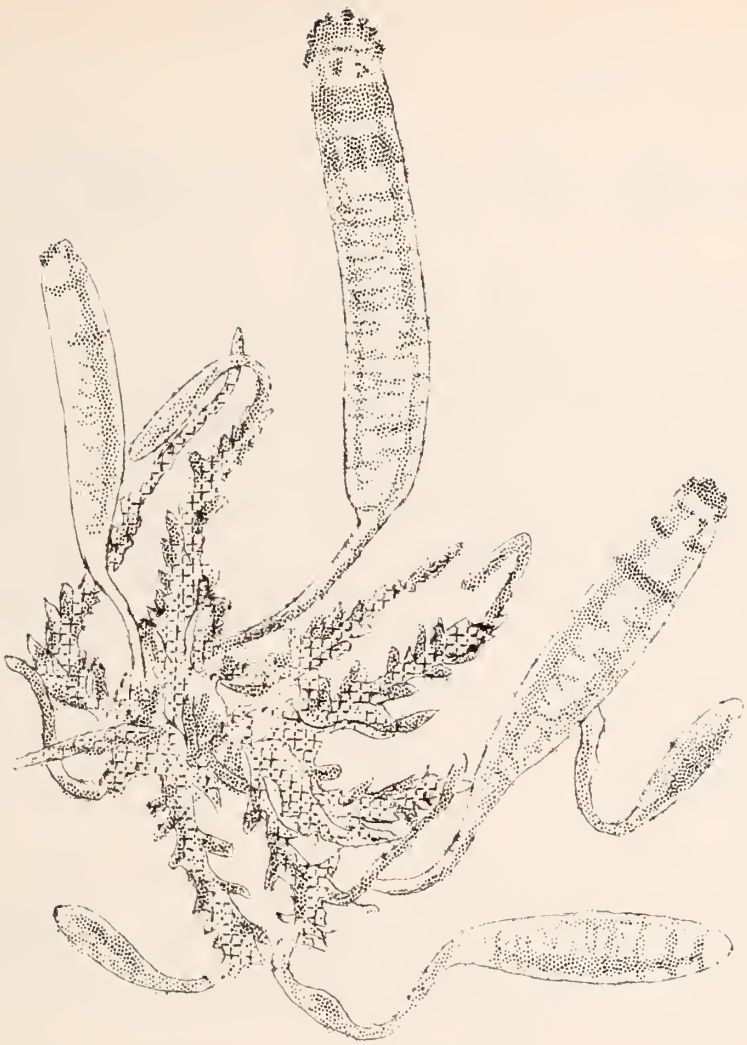
These develop into a many branched sac, which surrounds the snail's intestine (large one). On the inner wall of the sac arise numerous buds, which detach themselves and form the second stage of metamorphosis. Finally they turn into the last larval form, a "Cercaria".

The Cercarias are then tightly packed - like a roll of coins - into the blind end of one of the sacs. The sac is banded with white and green, its tip a dark brownish-red; it has the power to expand and contract. It pushes itself into one of the snails tentacles - distending it considerably - its colour pattern showing through the skin.

With the movements and the colour pattern the swollen tentacles resemble the larvae of certain flies. They are quickly seen and swallowed by the foraging birds, which of course don't realize that they are infecting themselves with the parasite.

The snails' tentacles grow again, and thus the play can be repeated several times. The sac even hibernates with the snail.

This is one of the few cases - if not the only one - where an animal is provokingly coloured to ensure its being eaten instead of being shunned.



SNAIL-KILLING FLIES.

L.W.Stratton.
Harpenden, Herts, England.

The Sciomyzidae is a family of dipterous flies long known to science and generally called Marsh Flies. There are some 440 species, of which 34 are endemic to New Zealand, so that some remarks on their lives and habits may be of interest.

It was in 1950, while in Alaska, that Professor C.O.Berg, of Cornell University, began an intensive study of the family. Some early entomologists had found puparia of Sciomyids in snail shells and thought that there might be some connection between flies and snails, though others denied this. Prof.Berg has established that the larvae of all Sciomyzids feed on molluscs of one sort or another. Since 1956 he has visited Europe, Australia, South America, Egypt, Israel and Afghanistan, and his assistant, Dr.L.V.Knutsen has spent two long periods in Europe working out the life cycles of these interesting insects. The author has had some small part in these researches and has watched with interest their pattern as they unfolded.

It has been found that "within the Sciomyzidae there is an astounding range of larval feeding behaviour and of related adaptations to the host snails." (Knutsen, 1962). At one end of the scale the larvae are entirely aquatic and predatory, at the other terrestrial and parasitic; between them are many species with intermediate habits. In the first group the eggs are laid on vegetation. The larva is entirely aquatic, and on hatching at once attacks ferociously a snail, quickly killing it and feeding upon it for only a short time. It then goes on to attack many more snails, often of different species. Pupation takes place outside the snail, the puparium being adapted for floating.

At the other extreme the female fly lays her eggs on the shells of snails, usually Lymnaea aestivating in leaf litter or Succinea on waterside vegetation. The eggs are laid along the suture and at right angles to it. When the larvae hatch, only one establishes itself within the host snail. It takes several days to kill it, and continues to feed on the dead tissue. It finally pupates within the shell, the puparium being modified for this purpose.

Between these two extremes are species whose larvae are partly parasitoid and partly predatory; some pupate within the snail shell, some outside. Some seem to prefer a particular species of snail (host specific), others are quite catholic in their tastes. Dr.Knutsen quotes an example ; "The only snail host observed in nature of Sciomyza dorsata Zett. was Planorbis planorbis Linne, but in the laboratory these larvae killed and fed on all 28 species of terrestrial and aquatic snails offered to them." When Prof. Berg visited England in 1959 his first expedition was with the author to high chalk downs, where he obtained Ditaenia cinerella Fall., which could have fed only on land snails. He sent some flies to Cornell. On the way they laid eggs. The resultant larvae were reared entirely on American aquatic snails. A further development has taken place during 1964. Dr.Knutsen discovered two species of Sciomyzids, one in Denmark and one in England, whose larvae feed on slugs.

So far over 100 Sciomyzid species have been studied, so there is still a long way to go, but already the practical implications have been recognised. There are many debilitating and even lethal diseases both in man and animals which are caused by parasites whose life cycle takes place partly in snails. Sciomyzid flies have been introduced into Hawaii in the hope of controlling liver fluke in cattle and some positive results have been achieved. There is a wide range for experiment, and the problem of Bilharzia, a disease from which one fifth of the world's population suffers, has not been overlooked, so the study of the Sciomyzidae is no longer one of merely academic interest.

The author is indebted to Dr. Knutsen for permission to use material from his paper, "Snail-killing Sciomyzid Flies," 1962, published in "The Cornell Plantations," Vol. 17, No.4.

--oOo--

From Mrs. Dunn of Napier :-

"These winds and beaches are a mystery to me. Our beach here at Westshore is a bivalve beach. We usually say a Westerly washes it clean, a South-east, North-east or Easterly, brings it up.

The winds have been wrong all winter. I usually pop out on Saturday or Sunday just to see - - a clean beach. Yet last Saturday morning with the tide just on full and no wind at all, coming in by the hundreds, were live Struthiclaria papulosa, Alcithoe and many Xenophalium pyrum, some quite large, but many with the protoconch damaged. One Alcithoe I got looks mighty like Alcithoe depressa to me, the lip coming right up on to the first row of nodules. I understand they don't come down this far. Also got a number of medium sized Phenatoma zelandica, but here is the strange thing - there wasn't a bivalve on the whole beach".

--oOo--

VISIT TO STEWART ISLAND.

J.Coles.

In January 1965 I was one of many holiday makers fortunate to spend a week on Stewart Island in almost perfect weather conditions. Even notorious Foveaux Strait provided two very calm crossings.

I went primarily to attend the New Zealand Forest and Bird Protection Society's camp which offered a wonderful week's programme of walks, launch trips, lectures, films, slides etc., in this area which is so well known as a naturalist's paradise. Participation in these activities left only a limited amount of time for shell hunting. However, the good weather and suitable tides enabled me to take advantage of what time was available and gave me some appreciation of the range and beauty of the marine life.

Within easy reach of Half Moon Bay are a number of fine beaches, ranging from sheltered ones within Half Moon Bay and Paterson Inlet, to more exposed ones such as Horseshoe Bay and Ringaringa.

The following were among the shells seen and collected in the various localities:-

HALF MOON BAY

Cantharidus opalus	-	Dead
Cantharidus purpuratus	-	"
Stirocolpus symmetricus	-	"
Xymene inferus	-	Dead and alive.
Modelia granosa	-	Alive 70mm x 70mm.
Alcithoe swainsoni	-	A small live one in a tide pool.
Melagraphia aethiops) Lunella smaragda)	-	Numerous and of large size.

BATHING BEACH

Here a wash up of a wide variety of seaweeds had recently occurred. The whole length of this small sheltered beach was covered to a width of approximately six feet and a depth of one foot. Attached to this were found :-

Tawera marionae	-	Several were complete and four were found with Alcithoe egg capsules attached. One of these had recently broken and two embryonic shells were found inside.
Myadora striata	-	One complete and numerous halves.
Thracia vitrea	-	Two complete and several halves.
Gari stangeri	-	A few complete.

HORSESHOE BAY

Alcithoe swainsoni - Three good specimens were found washed up alive. An egg capsule was found attached to a Stiracolpus symmetricus.
Struthiolaria gigas - Washed up alive.
Modelia granosa - Small, dead.
Diplodonta globus - Dead.

GOLDEN BAY

Alcithoe swainsoni - Common in muddy sand at low tide.
Buccinulum flavescens - Alive.
Lepsiella scobina albomarginata - Alive.
Mytilus edulis aoteanus - Alive and dead.
Aulacomya maoriana - Dead.
Perna canaliculus - Dead.

RINGARINGA

Haliotis iris - Alive, washed up attached to a kelp holdfast.
Haliotis australis - Dead.
Maurea punctulata ampla - Dead.
Maurea " stewartiana - Dead.
Pecten novaezelandiae rakiura - Dead.
Lepsithais lacunosus - Alive.
Paratrophon patens - "
Buccinulum littorinoides- "
Buccinulum tenuistriatum- "
Buccinulum strebeli exsculptum - Alive
Cellana radians - Alive
Cellana ornata - "
Cellana strigilis redimiculum - Alive
Siphonaria cookiana - Alive
Siphonaria zelandica - "
Siphonaria australis - "
Modelia granosa, 1 large 1 small. - Alive
Leptomya retiaria, complete - Alive
Chlamys celator, complete, embedded in sponge - Dead.
Terebratella inconspicua - Dead.
Hemithyris nigricans - "
Cominella nassarius - Alive and dead.
Barbatia novaezelandiae - Dead
Tanea zelandica, largest 26mm x 28mm - Dead.
Xymene plebejus - Alive and dead.
Gari stangeri - Dead
Soletellina siliqua - "
Ryenella impacta - "
Paphirus largillerti, largest 65mm x 50mm - Dead.
Anisodiloma lugubris - Dead
Zethalia zelandica - "
Glycymeris modesta - "

Although this is a very incomplete list of the species to be found, I hope it will give those of our members who have not yet had the opportunity of visiting Stewart Island, some idea of the range of species. There are a number of other excellent collecting areas, access to which is difficult by land, and also by sea, except in calm weather.

Although the most southerly of our islands, the impression remains of an exuberance of colour - the vivid rata in full bloom highlighting the sombre greens of the native vegetation, the varied hues of many species of seaweeds forming a constantly changing pattern in the startlingly clear water, the iridescence and richness of coleur of the many native pigeons present in large numbers even close to the settlement, and the golden-yellow of Buccinulums, Alcithoes, Cominellas with the brilliant splashes of colour of the Chlamys - who wouldn't wish to return ?

--oOo--

A further note to our comment on live Nassarius spiratus in the last issue :-

Mrs.Worthy has showed us a pair of specimens, taken alive and now in spirit. These were living in a tidal rock pool with a sandy bottom (North of Whangarei).

Live examples have also been found at Gt.Barrier (Mr.P.Warren)

--oOo--

Mrs.Boswell, Wanganui, has had two live Pteronotus which are apparently Pteronotus zelandicus Hutton. She writes :-

"They were trawled in 10 - 15 fathoms, out from Whangaehu. The size of the larger one is 19 mm x 12 mm. complete with operculum. The other one is only half the size.

Dr.Fleming tells me that there has been only one other live specimen taken from New Zealand waters, that being obtained by the New Zealand Marine Department Research Vessel 'Ihakatere' dredging 9 - 10 miles off Cape Farewell in 45 - 52 fathoms, August 8th,1963."

--oOo--

RAMBLES IN RAROTONGA.

L. Price.

In September-October, 1963, I had a 5-week trip to Lord Howe Island, collecting small land mollusca for the Chicago Natural History Museum. As this proved to be quite a success, I was again asked to do a trip, along similar lines, this time to Rarotonga, main island of the Cook Group. Commencing late in 1964, I was to spend 2 months on the island. To go by air, via Fiji and Samoa, I was required to have a passport, an entry permit for Samoa, an entry permit for Rarotonga, and vaccinations for smallpox and typhoid. Also, enough spare cash to cover a £100 bond (which included the remaining value of my air ticket) to be deposited on arrival in Rarotonga.

Thus, armed with a pocketful of red-tape, I left Auckland on a cold, showery evening in early November. Some 4 hours later it was a delight to step out into the soft, tropical air of Nandi, Fiji. After a leisurely tour of inspection around the airport lounge, we were off again - time 1 a.m. It seemed no time, when we were treated to a bird's-eye view of a Pacific dawn and just after sunrise, dropped below the green mountains to Pago Pago, Eastern Samoa. Another inspection, plus a long wait and we changed to a tiny DC3 for the short hop over to Faleolo, Western Samoa. From here, a fleet of modern American sedans soon whisked us the 20 miles into Apia, horns blaring, at 60 m.p.h.

As I had the next 4 days to wait for another air connection, I took the opportunity for a passing look at Apia and the surrounding districts. Installed at popular Aggie Grey's Hotel, I hired a bicycle for a couple of full-day tours out along the coast road, but I had to be careful to ride on the wrong side of the road, which is right in these parts. While poking around here and there, I came up with some very nice fresh-water Neritinas in the numerous mountain streams, also a few marine specimens amongst the rocks. Altogether, I rather liked what I saw in and around Apia, specially the profusion of flowering bushes and trees, including the magnificent hibiscus and fragrant frangipani.

In due course, we returned to Faleolo airfield and took off again in the same DC3, direct for the Cook Islands. After several hours with nothing but the blue Pacific below, we passed over lonely Palmerston Atoll and a short time later touched down in a cloud of dust at Aitutaki, a northern island in the Cook Group. Here, we had half an hour's stretch in the blinding sunshine, an exchange of passengers, then away on the last leg to Rarotonga. Within an hour we were there, zooming up the airstrip carved out of a forest of coconut palms. Leaving the baggage to be fumigated, I joined a taxi for the 2 mile run into Avarua, where I was soon installed in the Hotel Rarotonga, my headquarters for the next 2 months.

Rarotonga is a compact, oval island, about 7 miles long, by 4 miles wide, completely surrounded by a narrow coral reef, which drops down abruptly into very deep water. There is a level coastal strip averaging a half mile wide around the island, while the interior is completely mountainous. Although the highest mountain, Te Manga, is only 2140 feet, the ridges and peaks are extremely steep and narrow, being composed of crumbly volcanic rock. Vast groves of coconut palms occupy most of the coastal land and lower valleys. The mountains are clothed in a dense mat of small trees, shrubs and vines, plus a fine variety of ferns, including a magnificent king fern, with leaves up to 15 feet in length. Movement through the bush here is pleasant enough, there being no thorns, no snakes, leeches or vicious ants. About the only discomforts are numerous mosquitoes, specially after rain. Also common are large nasty-looking centipedes, but I was wary of these and had no trouble with them. Indigenous birdlife is extremely scarce, those most noticeable being 2 species of pidgeons and 2 species of terns, which nest high in the mountains. However, the cosmopolitan Indian mynah is common over the whole island. Originally, it is said to have arrived as a stowaway in ships. At first, I was intrigued to hear, while away in the interior, a rooster crowing on some nearby ridge, but later, I often disturbed a hen and chickens or a rooster scratching about in the underbrush. Of a dark brown and red colouring, somewhat larger than a bantam, no doubt these were domestic poultry "gone bush".

The collecting of land mollusca in Rarotonga seems to have been rather neglected over the past 80-odd years, nothing having been published about it since 1872 and 1881, when Garrett apparently collected and named a number of new species from this region. Even then, unfortunately, no exact locality data was given. So my task was to make a good coverage of the island, collect the snails alive, and at the same time, pinpoint each locality on a map.

With this in mind, my first visit was to the local Lands and Survey Office, where a large-scale map was obtained. Next, a scout around for my usual island transport - a bicycle - which I was able to borrow from a fellow hotel guest. The main road, mostly gravel, closely follows the coast around and amounts to about 20 miles. Another, only part way around, runs parallel a few hundred yards further inland and lesser roads run well up the main valleys. During the weeks following, that bicycle took quite a thrashing, doing anything up to 20 miles per day, but it lasted the distance admirably.

Altogether, about 20 species of the land mollusca were rounded up, which was somewhat disappointing, as many of Garrett's species could not be found. Many species seem to live on the ground in dry conditions, and then move up onto tree trunks, twigs and under leaves of shrubs during rainy periods.

Largest shell to be found was a species of Partula, smallest, a species of Omphalorissa. A tall species of Opeas was common everywhere. Just inside the vegetation limit around the shoreline, a small yellow Helicina was abundant after rain - this shell is often used for making necklaces and hatbands by the Islanders. For the most part, the weather happened to be rather drier and cooler than usual at this time of year, something for which I was most thankful. Nothing is worse than trying to rake up enough energy to move around in the Turkish bath atmosphere of the tropics in summer.

Although marine shells were only of a secondary consideration, I did take a look at them on suitable occasions, but there does not seem to be a great variety around Rarotonga itself. Perhaps this is due to the narrow reef and consequent rather restricted habitats available. However, I had the pleasure of seeing a fine, representative collection of Cook Islands marine shells owned by Judge Morgan, a resident at the hotel. Ultimately, he intends to donate his collection to the combined library and museum recently built in Avarua.

By January, 1965, the results of my collecting in Rarotonga were packed up and sent away to Chicago. A few days later I returned to Auckland, thus ending another quest after the elusive Snail.

--oOo--

Years ago when Ellatrivia memorata Finlay was mentioned, one naturally thought of Ahipara, near the Ninety Mile Beach, for this was where most of the earlier specimens were collected.

Now, with active collectors all over the country, our knowledge of the distribution of this cowrie is increasing all the time.

Just recently we have learned that Mrs.Greene of Napier has found Ellatrivia on her local beach (Westshore) - not very often, just a couple, two or three times a year. She also said that she has had them from several places on Mahia Peninsula.

Another member, Mrs.Williams, has reported finding specimens at Gisborne.

Any other locality records South of Auckland ?

--oOo--

MARGINELLA MAORIA POWELL.

N.Gardner.

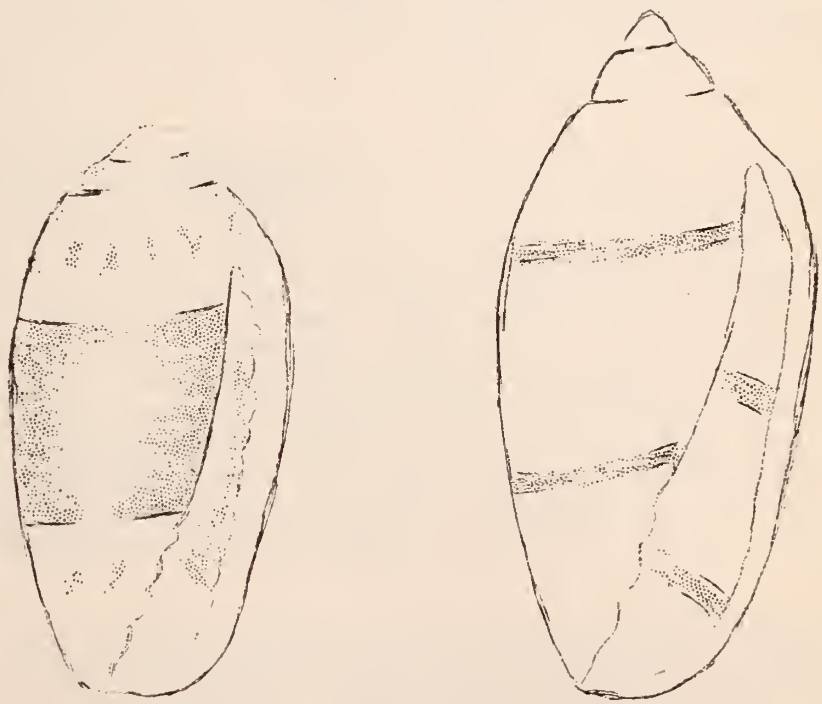
Members who have collected small molluscs from under rocks at low tide will no doubt have come across Marginella mustelina (Angas) - that attractive shiny species, rather slender, with a wide red-brown band around the body whorl.

There is also a second species, somewhat similar, which occurs now and again in the north only, and which is certainly worth watching out for. This is Marginella maoria Powell.

It is larger than Marginella mustelina and instead of having just one wide band, there are two narrow lines widely spaced on the body whorl. The outline is also different. The spire is taller, outer lip thinner and without denticles.

Most specimens so far taken have been washups or sorted out from shell sand. Live specimens have been dredged from deep water.

Examples have been collected from Cape Maria, Spirits Bay, Whangaroa, Bay of Islands and Whangarei, Great Barrier and Leigh.



KILLED BY "COOL, CLEAR WATER"

Norman Douglas.

It was my friend Roy Larritt, of Hamilton, who suggested the trip. He had not stalked deer in the South Island, so would I make the arrangements and accompany him on a little safari?

I said "Make it Stewart Island for whitetails (Odocoileus virginianus)?". But he said "No, I'd like a big red deer head" "Then it's Westland for Cervus elaphus?". His rejoinder was "I don't care about the Cervus so long as it's elaphus ! " Obviously he wanted a really big one. So Westland it was.

We flew to Harewood and thence by road over Lindis and Haast Passes, through miles of magnificent scenery down to Jacksons Bay. Here the road runs southwards through many miles of flat farm land near the sea. There were patches of bush beside a crackling surf on a shingle shore. And so with the mountains on our left and the sea on our right, we toured on to road's end - Jackson's Bay wharf. At the present time this is the southern limit of the all-weather roads on the west coast.

A perusal of the accompanying map will show that the wharf is situated in a very sheltered spot. This is caused by the hook of the shoreline produced by Jackson Head and the sheltering effect seems much more pronounced when one is there than it appears on a map. The wave swells from the open ocean normally pass by and strike the beach some hundreds of yards north of the wharf. On the other hand a north, to north-west wind, blows right in.

Now it so happened that a week or so before our arrival at the Bay, there had been a freak rain and wind storm from the North West. The Waiatoto and Arawata rivers, four miles and more to the north of the wharf, had reached extreme flood conditions. It caused the Arawata to shift it's mouth about half a mile further south. Some idea of the quantity of fresh water involved can be gauged by mentioning the Arawata river alone. The map is scale drawn by pantograph from a Lands and Survey Department map. The Arawata river is approximately a half mile wide at a point where we could see that it had risen between 10 and 20 feet. A vast amount of fresh water was driven by the north-west wind right down the coast and into the bay at the wharf. The sea must have been changed to almost pure fresh water and its effects upon the sea creatures was plain to be seen.

Strewn upon the beach for about a half mile from the wharf, northwards, and under a hord of sandflies, were thousands of sea creatures which had lost their lives. The beach was stinking.

Smothering ourselves in insect repellent, Roy and I braved the sizzleing hord to investigate one of the most interesting washups I have ever seen. The following will not be a complete list but should give some idea of the situation. Not all the specimens were fresh dead and it is realized that not all would be killed by fresh water.

Kelp: Probably tons.
Sea urchins: Hundreds. Evechinus chloroticus.
Crabs: Dozens. Camouflaged spider crabs; large red crabs.
Crayfish: 83 counted. All Jasus lalandii.
Paua: Haliotis iris - Up to 5". Thousands.
Haliotis australis - Up to 4". Hundreds.
Haliotis virginea virginea - Up to 65mm. We brought back between 300 and 400 by rough count. Most of these have now been given away.
Mussels: Mytilus edulis aoteanus. To about 4" in length. Hundreds.
Aulacomya maoriana. To about 3" in length. Hundreds.
Perna canaliculus. To 5". Not so many as the other two species above.
Cookia sulcata: Diameter to 4". Hundreds. Most were dead. Only a few were still alive.
Argobuccinum tumidum: Up to about $3\frac{1}{2}$" long. Perhaps a hundred. Some were still alive. Two were attached to mid-littoral rocks.
Modelia granosa: Up to about 2" diameter. Estimate, about 20. All were dead but some, or most, had the animals still inside the shells.
Lunella smaragda: A few only. To 60mm.
Trochus viridus: A few. 20mm.
Maurea punctulata stewartiana: 30mm. A few dozen. Many with operculums still showing.
Maoricolpus roseus: A few beach worn.
Austrofusus glans: To 50mm in length. Perhaps a dozen near the wharf, which is a rocky area, but hundreds at the mouth of the Arawata river. The mouth area is gravel but it is probably sandy further out.
Charonia capax: One only. Broken, about 110mm.
Protothaca crassicosta: Up to 48mm. A few.
Paphirus largillierti: To 50mm. A few.
Zearcopagia disculus: One, 30mm.
Monia zelandica: A few, with weeds attached.
Tawera spissa: A few - not many.

When the tide was very low an examination of the tidal rocks was made. Living species obviously little effected by the flood, were conspicuous by their numbers : Lepsithais lacunosus; Lepsiella scobina albomarginata; Lunella smaragda; Siphonaria zelandica; Melarhapha oliveri (small specimens); Melarhapha cincta (small specimens); Cellana radians perana; Cellana strigilis rediniculum; Melagraphia aethiops; Zediloma digna; Zediloma arida; Axymene turbator; Buccinulum litterinoides; and some chitons.

However, it was otherwise for the Pauas in this prolific area. Haliotis iris were found under the stones where they had apparently dropped off and were freshly cleaned out. Only one was found alive. This small specimen made all haste to get back under my upedged stone. Was this an extra tough specimen, able to resist fresh water? Or was it residing in a salt water pocket under a large stone at the time of the flood?

While we were at the Bay two trawlers appeared at the wharf. One of these trawled for fish mostly, while the other one trawled only for bait for cray-pots. Asked about shells, the fish trawler brought in Argobuccinum tumidum, a handfull, whilst the cray-men handed me two Charonia capax. These were nicely coloured, being trawled in shallow water. One is 135mm. in length, the other 160mm. They said they seldom trawled for bait beyond 20 fathoms. They also handed me Xenophalium pyrum, Struthiolaria papulosa papulosa, Alcithoe swainsoni and a great disappointment! Seen amongst the shells upon the trawler deck, about seven feet below me on the wharf, was a slim, creamy volute about five to six inches long and about $1\frac{1}{4}$" in diameter. It had deeply impressed sutures on the long spire. As the skipper handed up a bunch of shells, one slipped through his fingers, "plop" into the water. It was the slim volute! How I wished for my dredge! The skipper was very regretful, saying that it was the only one he had ever seen and that it had been taken alive. Unfortunately, time did not allow us an opportunity to make a determined effort to retrieve the shell from 12 feet of murky water.

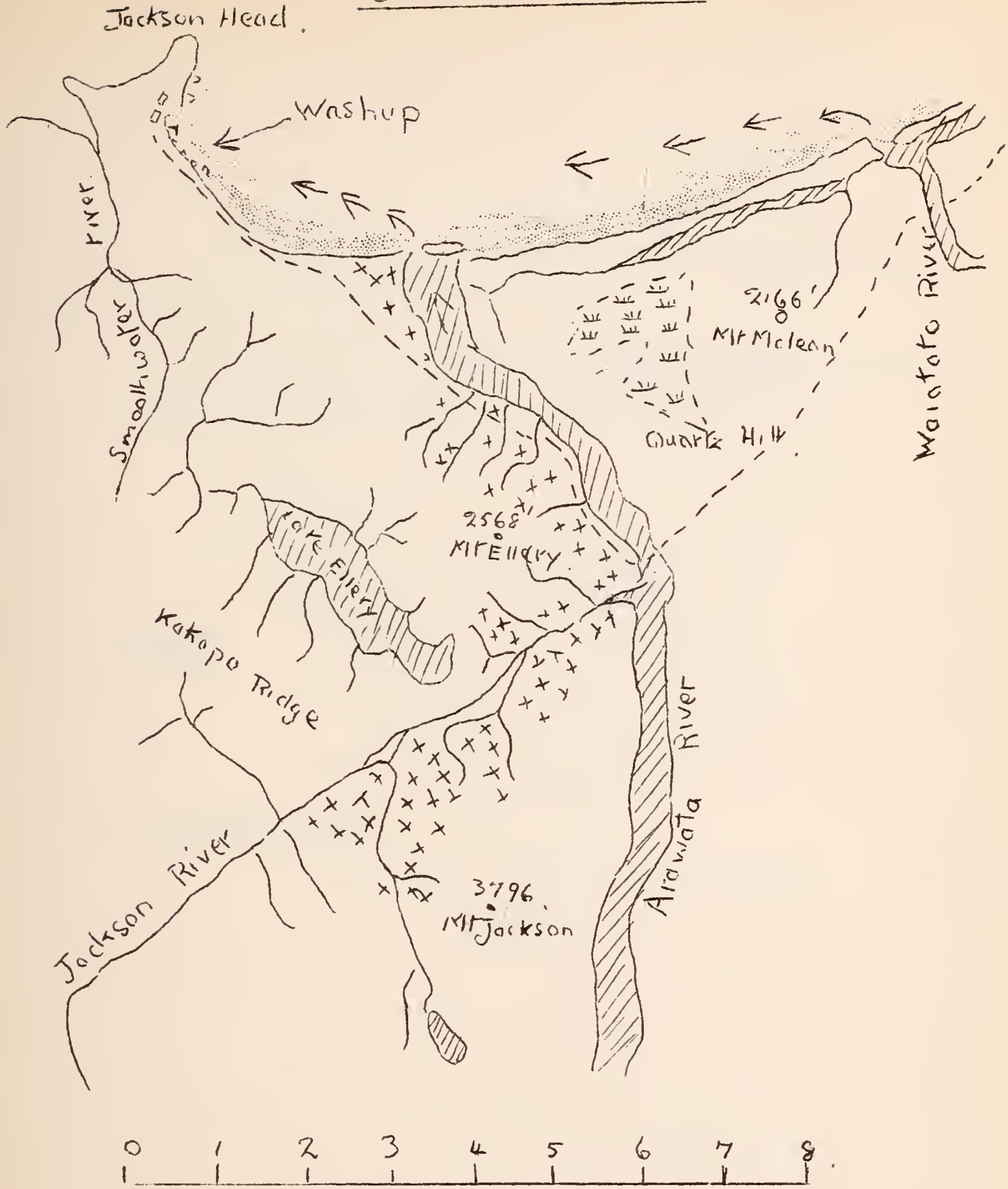
Camping out, Roy and I spent almost two weeks stalking stags in the bush during a spell of perfect weather. The area traversed is shown roughly by little crosses on the map.

The southern side of Mt.Ellery appeared to be too wet for deer. We saw none there and almost no sign. The ground, the stumps and the logs are all covered with a thick oozing sponge of moss. It seems to be too wet for ponga ferns even, and not a snail could be found.

On the north western side of Mt.Jackson the conditions are much better. Here there are tree ferns aplenty, but it is still extremely wet and mossy. We waded through Prince of Wales feather ferns, waist deep and deeper. Fungoids ranged in size from minutes to 15 inches across. Their colours diversified from lemon and orange through browns to blood red. But where were the snails? Although we searched areas ranging from near sea level to 3,000 feet we could not find a snail of any kind.

In the stream between Lake Ellery and the Jackson River we found live specimens of a fresh water mussel. They appeared to be the usual Hyridella menziesi, as were also those I'd seen on an earlier trip on the Cascade flats further inland.

JACKSON BAY



Scale of Miles

Bush area covered : x x x

Wind directed fresh water : → →

Map pantographed by the author from Lands & Survey map 'N323/28.
ND.

On the way home we digressed a little to investigate the new motor road being built on the West coast northwards from Haast. Crossing the new bridge over the Haast River the road runs beside the sea for 10 miles. This is 10 miles of shingle beach without a single shell until at last some rocks are reached. When we arrived the tide was low. There was kelp, blue mussels, barnacles, Cellana radians perana, Cellana ornata, Benhamina obliquata, and waves that rolled and rattled on a shingle shore.

Yes, Roy took home the antlers of a Cervus elaphus, but perhaps they were not quite so elephantine as he had hoped.

--oOo--

MAGAZINE ARTICLES OF INTEREST

'ANIMALS' - Sea Anemones - 3rd.November 1964.

Molluscan Shell Patterns - 10th.November 1964.

Echinoderms - 20th.December 1964.

'NATIONAL GEOGRAPHIC'

Tree Snails - Gems of the Everglades - March 1965.

--oOo--

Editors: N. & N.Gardner.

POIRIERIA

Auckland Museum
Conchology Section

Vol. 3

CONCHOLOGY SECTION AUCKLAND INSTITUTE AND MUSEUM.

POIRIERIA.

VOL.3. PART 1.

GRAZING CARNIVORES - SOME SEA-SLUGS FEEDING ON SEDENTARY INVERTEBRATES

BY

M.C. MILLER.

INTRODUCTION.

Nudibranch molluscs feed on a wide variety of sessile animals; sponges, hydroids, sea-mosses (polyzoans) and sea-squirts (ascidians) being the kinds commonly eaten. All nudibranchs have special diets: many eat only one kind of food e.g. sponges and some of these specialize to such an extent as to feed on only one species e.g. *Archidoris pseudoargus* only eats the sponge *Halichondria panicea*; others are not quite so fussy and may feed on species from two quite different groups of organisms e.g. *Goniodoris nodosa* eats polyzoans and ascidians. As will be shown later, each main type of food is eaten in a different way.

Since nudibranchs are specialized feeders their lives are very much influenced by their food organisms. A nudibranch always lives on or near its food and the size of populations is controlled directly by the condition of the food - numbers are large when food is abundant, small when it is scarce.

STRUCTURE AND FUNCTIONING OF THE GUT

The nudibranch gut has two important regions for dealing with the food; the buccal mass which effects ingestion and the stomach and digestive gland where digestion takes place. Of the rest of the gut; the oesophagus is simply a pipe through which food is conducted to the stomach from the buccal mass, and the intestine functions as a tube through which the wastes are expelled.

The sea-slug breaks up and ingests the food organism with its buccal mass using the radula (a tongue of chitinous teeth), jaws or both, and at the same time covers the prey with mucus from the lips and enzymes from the salivary glands. The food is then passed to the oesophagus and, by the action of cilia, peristalsis or pressure caused by the intake of more food, it is quickly transported to the stomach. In the stomach enzymes from the salivary and digestive glands attack the soft parts of the food and these are soon broken down into small particles. These particles are then either engulfed by amoebocytes which pass back and forth through the wall of the stomach or they are driven, by ciliary activity or the contraction of the stomach, into the digestive gland and swallowed up there by certain cells of the epithelium - whichever way, the final stages of digestion are intracellular. Once digestion is complete these same cells extrude waste matter and this is added to the large indigestible fragments which have already been shunted to a particular region of the stomach. Periodic contractions of the stomach squeeze these residues into the intestine where they are moulded into faeces and then transported to the exterior.

Since nudibranch food often contains hard material, mucus must perform two important functions; it must ease the passage of this material through the gut and protect the delicate gut wall from being damaged by it.

FEEDING MECHANISMS

An examination of various species from each of the four major groups of nudibranch will show that there are several different methods of feeding and that these are related to the kind of food organism eaten. The methods fall roughly into three categories: scraping, tearing and biting, and sucking. In each case the gut shows certain modifications associated with the feeding habits: the most important of these occur in the buccal mass - this organ clearly reflects the feeding habits, though this is hardly surprising since it is the anterior region of the gut which is responsible for ingesting the prey.

SCRAPING

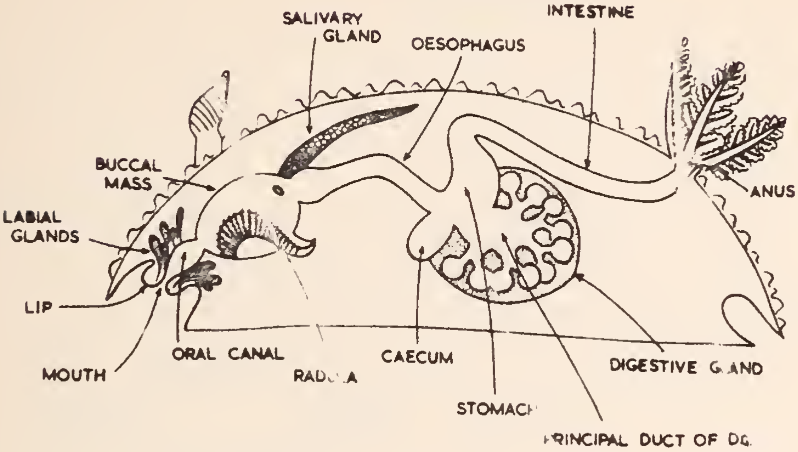
The sponge-eating dorids (the large sea-lemons) are nudibranchs which scrape out their prey. Local examples of these are :

Archidoris wellingtonensis which feeds on *Hymeniacidon perlevis*,

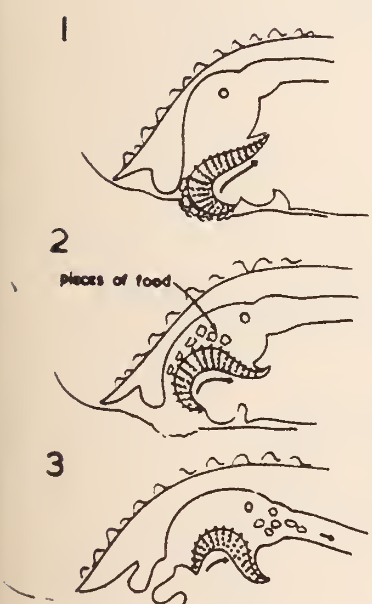
Glossodoris amoena and *G. aureomarginata* on *Dysidea fragilis*,

Rostanga rubicunda on *Microciona coccinea* and *Holoplocamia novizelanicum*

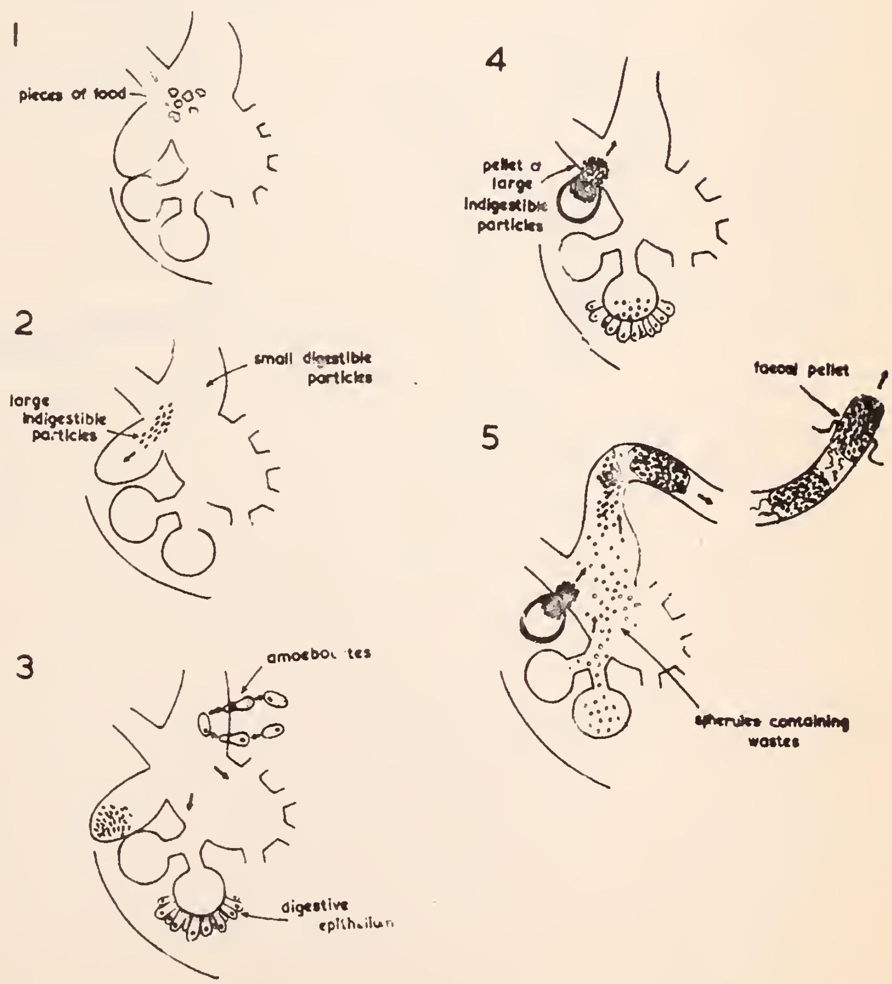
STRUCTURE AND FUNCTIONING OF THE GUT



INGESTION

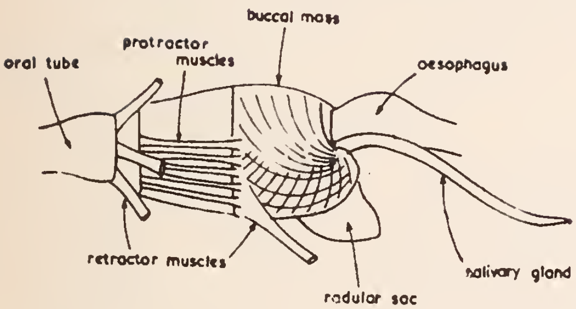


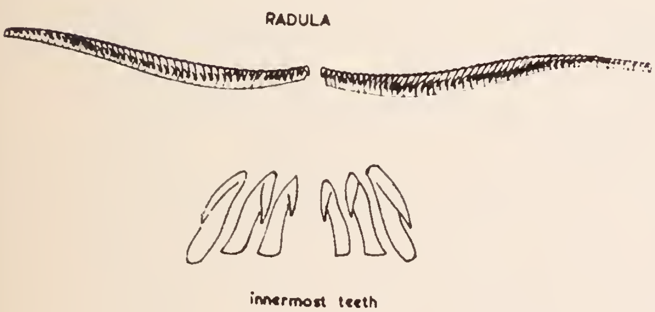
DIGESTION IN THE STOMACH AND D.G.

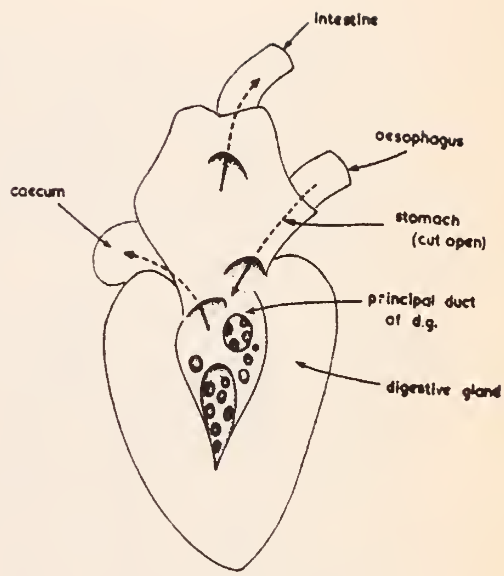


SCRAPING

Archidoris







These dorid nudibranchs have a very broad radula (with as many as 200 teeth in a transverse row) which they use to rasp the sponge; the continual to and fro movement of this tongue through the mouth, accompanied by an opening out and closing together of its two halves, tears off small pieces of the sponge and conveys them to the oesophagus. A special feature of the gut of these dorids is the stomach caecum which serves as a repository for the sponge spicules until they are passed to the intestine.

TEARING AND BITING

The mechanisms of tearing and biting are essentially similar and only differ in the way the food is detached, raggedly or cleanly, and this, as we will see later, depends on whether the prey is tough or delicate.

Tearing with the radula

This method is used by the polycerids, a group of sea-slugs which eat polyzoans. The polycerids have a buccal mass which has a pair of delicate jaws and a fairly narrow radula with large hooked teeth. A local example is a species of *Polycera* (a new and as yet unnamed one) which feeds on *Bugula stolonifera* and *B. neritina.* When feeding the animal works at the tips of the branched colony. It rolls out its lips and grasps the terminal section of the branch with the jaws. The radula is then worked against the proximal zooecia of this section and, at the same time, the animal tugs the branch by contracting the head on the firmly anchored hind end. Eventually, by the continued plucking of the radula and tugging of the body, a short segment of 8 - 10 zooecia is broken off. This fragment is gradually drawn in through the mouth and carried to the oesophagus by the radula. Ingestion of the fragment is effected by the large hooked laterals of the radula which act as grappling irons. When the radula is thrust out through the mouth these teeth separate and then, at the commencement of withdrawal, they close around the fragment and pull it in. Gradually the radula is worked to the tip of the detached piece until the whole of it has been hauled in. During the forward stroke of the radula when it is not clasping the fragment is held by the lips at the top of the mouth.

In the juveniles the mode of attack is somewhat different. The young animal is too small to snap off pieces of a polyzoan colony and, therefore, resorts to squeezing the soft polypide out of its house (zooecium). When feeding the animal rolls out its lips, dilates the mouth and grasps the open end of the zooecium. Rhythmical contraction and relaxation of the lips forces the polypide in and out of the zooecium rather like a jack-in-the-box. This action is synchronised with the back and forth movement of the radula which tears off pieces of the polypide each time it is pressed out.

Tearing with the jaws

The pachygnathousarminids are a group of sea-slugs which practise this form of eating - they prey on polyzoans.

A local species is Madrella sp. (another undescribed species) which feeds on the polyzoan Beania magellanica. When feeding the mouth is opened wide and the buccal mass thrust forward so that the jaws and radula are protruded. Jaw and tooth movements are synchronized with those of the buccal mass; when the buccal mass is thrust forward the jaws and lateral teeth of the radula open, when it is withdrawn, they close. The polyzoan zooecium is fractured by the action of the jaws closing upon it and drawing it into the buccal cavity accompanied by the contraction of the head on the firmly fixed foot. This is repeated many times until the zooid or part of it is torn from the colony. The radula acts as a conveyor belt and transports the detached zooid to the oesophagus. The whole action is rhythmical, there being an active phase of 10 - 25 seconds during which the animal makes 4 - 8 thrusts with the buccal mass followed by a resting phase of 60 - 70 seconds.

Biting with the jaws and radula

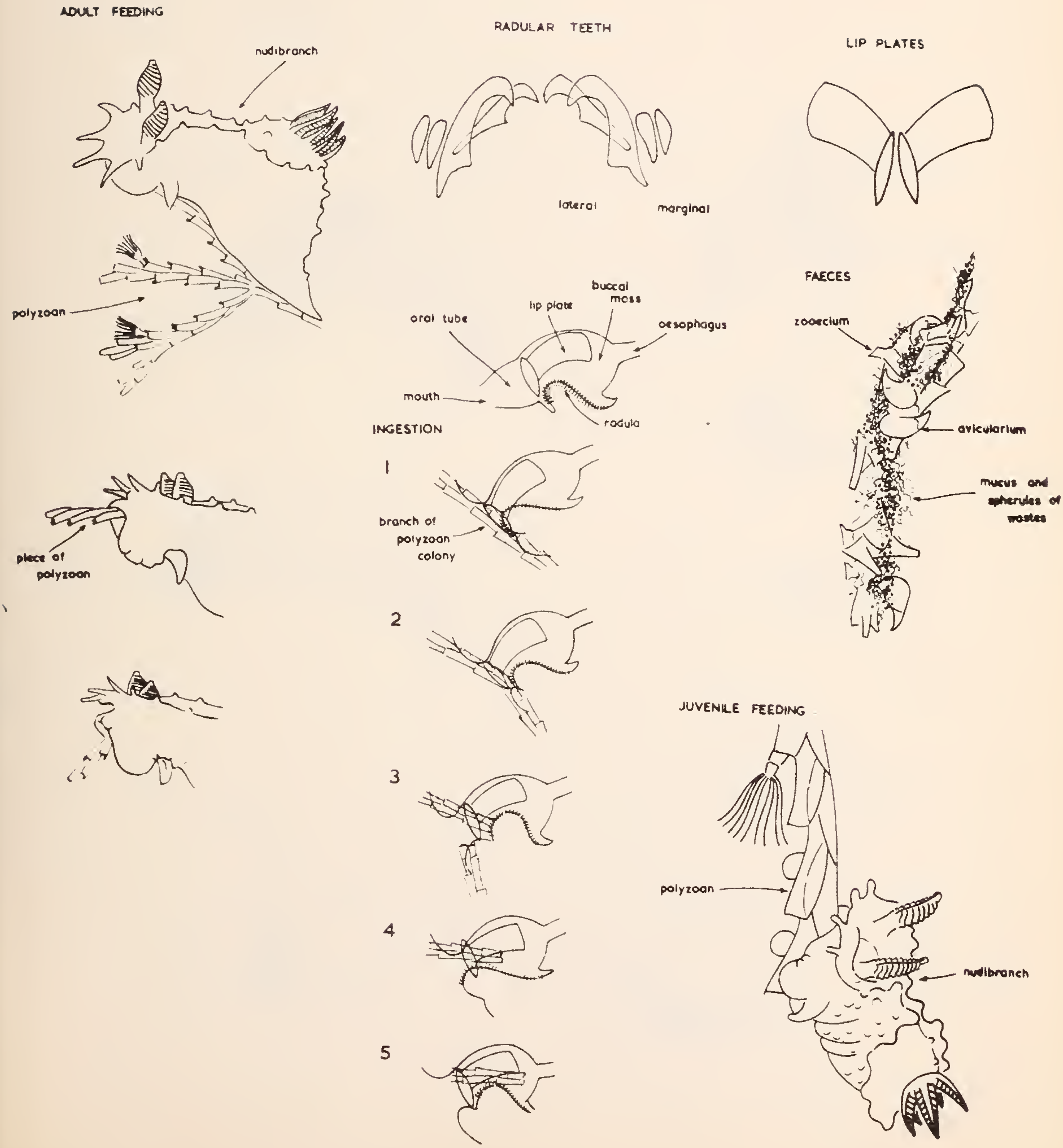
This is the mode of attack of those sea-slugs which feed on coelenterates i.e. the dendronotids and aeolids.

Tritonia, a species which feeds on Alcyonium (dead man's fingers) has very large, strong jaws and a broad radula with as many as 400 teeth in a transverse row. During feeding the buccal mass is protruded and the radula grips the surface of the Alcyonium colony, fixing the buccal mass and thus giving the jaws the purchase needed for effective cutting. The jaws close together with force and cut off a piece of the colony (this can be quite large - it may sometimes be the size of a French bean) which is then conveyed to the oesophagus by the radula as it is retracted. Apparently the juveniles are unable to cut the thick outer covering of the Alcyonium colony with their jaws and have to scrape it away with the radula.

A large proportion of these biting nudibranchs feed on hydroids. They also have a buccal mass armed with jaws and a radula, but the latter is fairly narrow with few teeth in a transverse row and there is a large central tooth. The radula of the most advanced aeolids is reduced to a single row of very large teeth, the centrals. The feeding action of these sea-slugs is like that of Tritonia except that the radula functions as a third cutting edge. The two jaws and the radula form a triangle of blades which cut into and grip the prey as it is pulled into the buccal cavity. Withdrawal of the buccal mass is accompanied by violent contractions of the head end of the body. This cycle may be repeated several times before the hydranth (a feeding head of the hydroid colony) or part of it is detached. Large individuals of Hero and Facelinella can bite off the whole head of a polype of the gymnoblastic hydroid Tubularia.

TEARING WITH THE RADULA

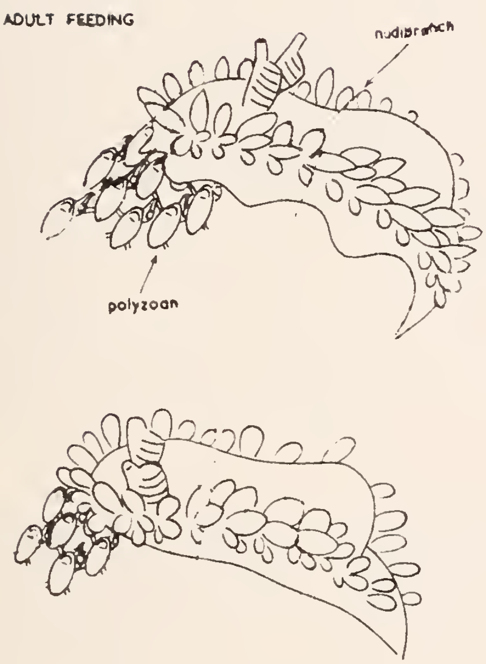
Polycera

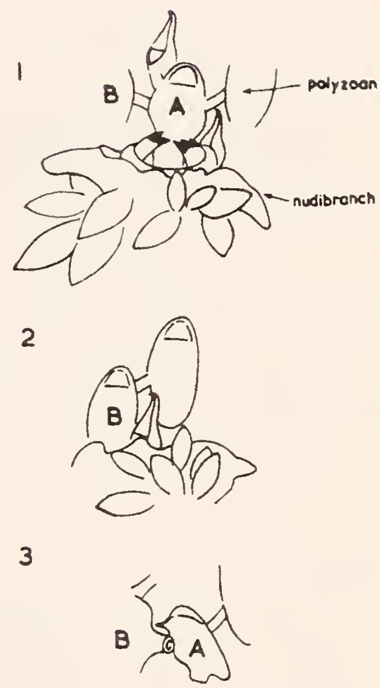


TEARING WITH THE JAWS

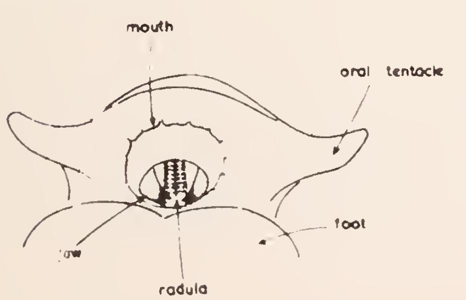
Madrella

ADULT FEEDING

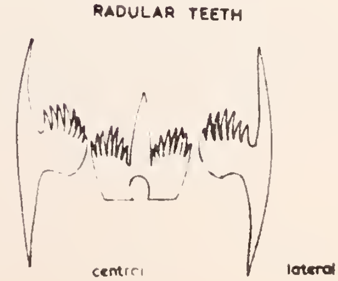




HEAD ventral view



RADULAR TEETH



Those aeolids which feed on sea-anemones e.g. Aeolidiella attack their prey in the same manner as their hydroid eating relatives. They do show, however, one important structural modification; the tooth of the radula (consists of a single row of teeth, the centrals) is very broad and forms a wide blade which is most suitable for cutting into the broad surface presented by such large prey. An attack on an anemone is usually made on the oral ring particularly near the edge.

SUCKING AND PUMPING

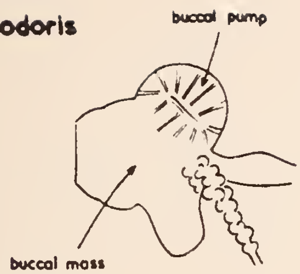
Various kinds of dorid nudibranch feed in this manner; they prey on barnacles, ascidians and polyzoans, particularly ctenostomes and chitinous cheilostomes. They all possess a buccal mass which has the dorsal wall modified to form a suction device - the structure of this varying from species to species. In Acanthodoris pilosa a species which feeds on Alcyonidium species, this suction apparatus - the buccal pump - is simply a swelling in the dorsal wall of the buccal mass; in Onchidoris fusca, which feeds on barnacles and polyzoans, it is highly developed and has the form of a muscular globe attached to the buccal mass by a narrow stalk. Since the buccal pump is not exclusive to any one systematic group, possession of it indicates a distinctive feeding habit not a phylogenetic relationship. The radula is very narrow and has only four teeth in each transverse row, the innermost being the largest - the points of each pair of these lateral teeth diverge and in some forms they are probably used for lancing and compressing the prey.

A local species of suctorial dorid is a species of Okenia (new and unnamed) which feeds on the delicate ctenostome polyzoan Zoobotryon pellucidum. Okenia has a bulb-shaped buccal pump which is attached by a wide stem to the anterior end of the buccal mass. When Okenia feeds it works slowly along the branches of the colony sucking in the zooids rather like a vacuum cleaner. The lips are held in such a way as to reduce the mouth to a small orifice, little larger than the diameter of a single zooecium. The mouth is fastened to the top of a zooecium and the radula is worked against it, the strokes being short and rapid. At the same time the buccal pump is dilated, creating a suction force which draws the polypide out of its zooecium. The polypide withdraws when the suction is released. This sucking action is repeated several times so that a tug-of-war develops between the polypide and the nudibranch. Soon, however, the polypide is sucked out of its house or, if the connection between the stem of the colony and the zooecium is weakened, the zooid is ingested. Once the zooid has been drawn into the buccal cavity, the mouth is closed and the subsequent pumping phase of the bulb forces it along the oesophagus.

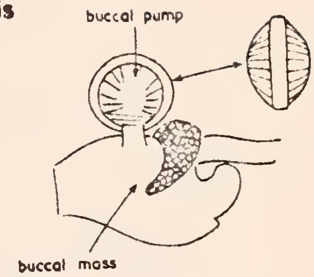
--oOo--

SUCKING AND PUMPING

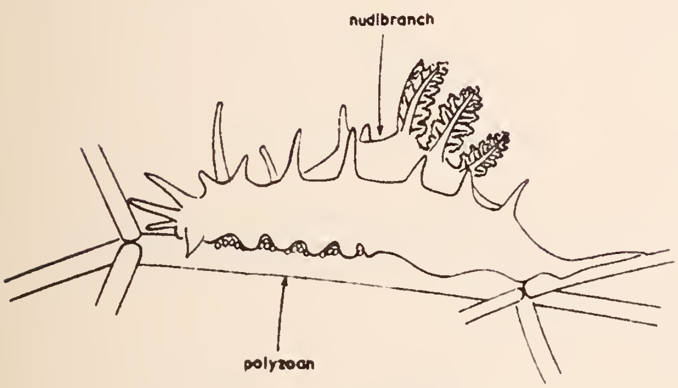
Acanthodoris

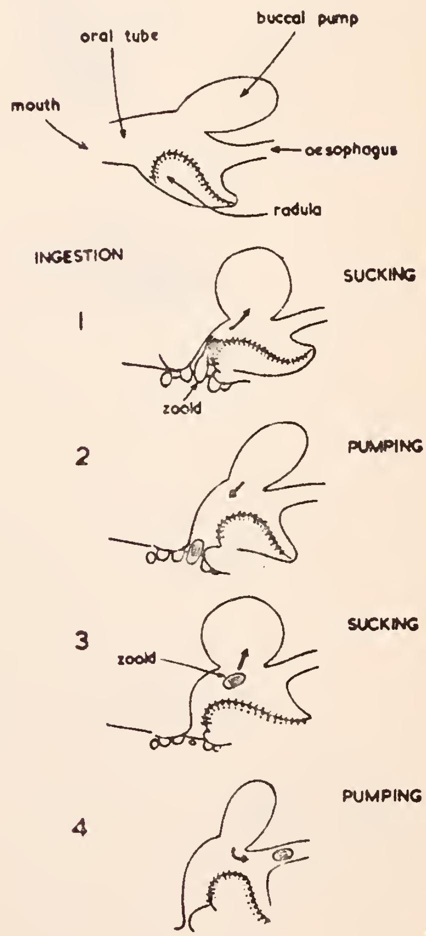


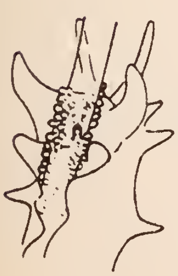
Onchidoris



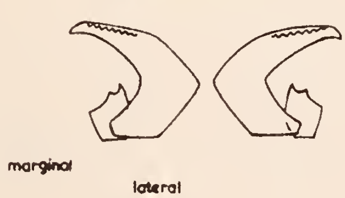
Okenia



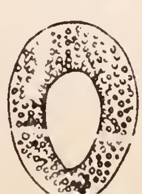




RADULAR TEETH



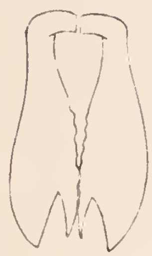
ORAL RING



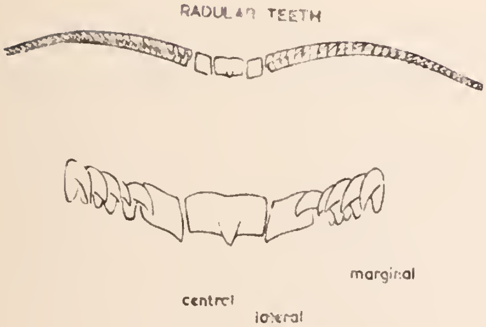
BITING

Tritonia

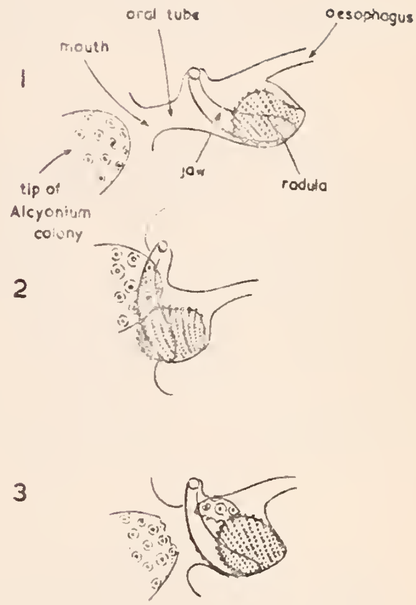
JAWS



RADULAR TEETH



INGESTION



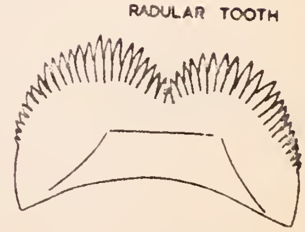
Facelinella

RADULAR TOOTH

JAW

Aeolidiella

RADULAR TOOTH



MOLLUSCS AND MAN

(Condensed from an Article in the British Medical Journal 31st. July 1965)

J.ROSENBAUM.

Molluscs are necessary intermediate hosts of a wide range of parasites causing much disease in man and his domestic animals. The most important snail-transmitted disease is Bilharziasis, which infects between 180 and 200 million people in parts of China, Egypt, Africa and South America.

Bilharziasis is on the increase. New areas are being invaded, especially where irrigation projects and dams provide breeding places for the snail host. The bilharziasal worms are blood flukes, which live in the bowell, bladder or liver veins. They are related to other flukes which live in the bile ducts, gut or linings respectively. (The latter causing endemic blood-spotting) These are only a few of the many flukes which infect man. Although they all develop in different species of snails some are transmitted to man through a second host, which might be a fresh water fish, a crustacean or an aquatic plant. Remarkably little is known about many of the snails of medical importance, but there are signs of an increased interest in the subject.

Most of these infections are animal diseases, with animal reservoir hosts. The living flukes, the liver-flukes and the bowel-flukes are all found in a wide range of wild and domestic animals. The same is true of bilharziasis, especially in the far east and in Brazil. In Africa Baboons are known to be affected with one species of "human" bilharzial worms and cattle with another. Recent advances in medical treatment have had little effect on the prevalence of these diseases. Although sanitary measures and health education have had some success, the most effective control has been in areas where attention has been given to killing the Snails. The most striking results have been achieved throughout a vast area of Northern China, and two million acres in the Gezira irrigation scheme in the Sudan. Snail control was first introduced in Egypt but bilharziasis is still a formidable problem in that country, despite an enormous annual expenditure on molluscacides.

Snail control is now receiving the attention of some of the large chemical concerns. An ideal compound - toxic to snails, non toxic to mammals and fish, and effective in very low concentrations - has not yet been developed. But several are available which are effective in concentrations of less than one part per million, and are much less toxic to mammal and fish than older molluscacides such as copper-sulphate and phenols. But poisoning is not the only method of snail-control. Excellent results have been achieved by changing the snails' environment. In China, where the bilharzial snails are amphibious, they can be drowned by flooding affected areas. The converse is sometimes possible in Africa and South America where the bilharzial snails are aquatic; they can be dried out but unfortunately many of them can survive for long periods in dried mud. In the West Indies a large cannibalistic South American snail has been introduced and it has effectively controlled the bilharzia-carriers in some streams. The introduction of snails from one area to another, however, can have unforseen results. When the giant edible African land-snail, Achatina, was introduced into the Pacific Islands, it proved to be an excellent host to the local rat lung-worm. This parasite is now believed to be the main cause of an epidemic type of meningitis in the Pacific.

In Britain (and New Zealand) the liver-fluke is still a major veterinary problem in sheep farming areas, and from time to time man is infected. However it is much commoner in Europe, where watercress is often contaminated by infected snails.

(Particulars about the development of flukes are to be found in "Animals Parasitic in Man" by S.Lapage. Pelican books A 397. The Editor.)

--oOo--

NOTES OF INTEREST

Laurie Price, who is land snailing with Dr. Solen in Western Samoa, writes that they are settling down to some steady field work :-

--"Although it has rained most days, only a couple of times has it been too thick for collecting. We have been around 9 localities in various parts of Upalu, some places more than once.

Unexpectedly, many of the species are widespread over the island from 2400' down to about 100' (the altitude range we have covered so far).

As one would expect in hot, wet tropics, many species are found above the ground on trees and shrubs - even some genera or families which are normally confined to the ground in drier climates - (e.g. Succinea, Helicarion, Subulina) Amongst the larger species we've got to date are 3 species of Partula, 2 species of Succinea, 3 species of Trochomorpha, 2 species of Ostrodes and about 4 species of Helicina. Of these, the most intriguing to me are the Ostrodes sp. - these are operculates of Cyclophoridae."

For Collectors who anticipate some shore collecting in the North during vacation, we give some details of the new Quibulla subtropica described recently by Dr.Powell, (See New Publications, in this issue) as they would stand a good chance of coming across wash-ups of this species.

Q. subtropica.

Q. quoyi

This shell is, actually commonly found in Norfolk Island, but has now been recorded from several places in Northland from Cape Maria to Whangarei Heads. While our Quibulla quoyi (Gray) prefers harbours or esturine situations, Quibulla subtropica apparently lives offshore from clear ocean beaches.

Quibulla subtropica differs from Quibulla quoyi in the following details :-

Shape :- More cylindrical, outer lip bent in somewhat in centre.

Apical cavity :- Straight side, not tapering as in quoyi.

Colour:- Blotched pattern, reddish brown colour, no spirals on base.

Editor.

Mrs.Johnston of Herne Bay had some interesting finds while shell hunting up beyond Whangarei. Her prize shell was an empty Mammilla simiae (Deshayes)- of good size and beautifully marked.

Under a stone resting in sand at the same beach were a multitude of small shells - many alive but some inhabited by hermit crabs.

The best of these species were :-

Over two dozen Pellax huttoni (Pilsbry) ranging from adult to some the size of a pin head.
20 - Austromitra rubiginosa (Hutton)
1 - " antipodum (Brookes)
1 - " erecta Powell

contd/

7 - Neoguraleus tenebrosus Powell.
22 - " murdochi (Finlay)
2 - " sandersoni Powell.
" whangaroaensis Powell.
1 - Aoteadrillia rawitensis (Hedley)
3 - Macrozafra subabnormis (Suter)
1 - Liratilia subnodosa Powell.
35 - Rissoina anguina Finlay - These were lined, blotched, zigzag marks, various colours and plain yellow.
Rissoina chathamensis (Hutton)
6 - Zemitrella stephanophora (Suter)

NEW PUBLICATIONS.

Part 2 of Vol.6. of the Records of the Auckland Museum made its appearance in October 1965. This is devoted entirely to Molluscan research and contains much of interest to the New Zealand collector, both casual and advanced,

Three very detailed papers are by Mr.W.Ponder - the titles and abstracts are as follows :-

(1) The Family Eatoniellidae in New Zealand by W.F.Ponder.
No.2. pp.47 - 99.

Abstract :-

"A New Family, the Eatoniellidae is proposed, and 23 new species, 5 new sub-genera and 3 new genera are described.

Classification of the 43 New Zealand species has been based, where possible, on a combination of the morphology of the shell, the operculum, the radula and exposed animal."

(2) A Revision of the New Zealand Recent Species previously known as Notosetia Iredale 1915. (Rissoidae, Gastropoda)
W.F.Ponder, 101 - 131.

Abstract :-

"The thirty recent New Zealand species previously classified in the genus Notosetia are reviewed. The revised classification of these species is based on a study of animal, operculum and radula. The species are regrouped in three families and nine genera and sub-genera. Five new species, 3 new genera, 3 new sub-genera and one new sub-family are described."

(3) A Revision of the New Zealand Recent and Fossil Species of
<u>Estea</u> Iredale 1915. W.F.Ponder, pp 131 - 161.

Abstract :-

"The Genus Estea Iredale, is described and the recent and fossil New Zealand species are revised. Details of radula, opercula, penes and external appearance of animals of several species are given. A new sub-genus is created for Estea angustata Powell; several species are synonymised, and two new species are described. Five species previously included in the genus are excluded."

Dr. Powell presents a paper entitled :-

"New Zealand Molluscan Systematics with Descriptions of New Species: Part 5. A.W.B.Powell.
pp. 161 - 168.

Abstract :-

"In this part, Five new species and five new genera to the New Zealand Recent fauna are described or recorded: a surprise item is a new species of the Mediterranean architectonicid genus Cyriscus. Of special note is the great increase of the sub-tropical element, represented by the recording of the first New Zealand recent occurrance of a true Cypraeid; a large porcellanous Polinices and the subtropical or tropical Annoperenna verrucosa, Pomiscala perplexa, Bulla (Quibulla) subtropicalis new species and Atys naucum. The large North Queensland Latirus gibbulus recorded on the basis of one empty shell is noted but further records are required before this exotic species can be admitted as a natural occurrence in the New Zealand fauna."

--oOo--

THE MARINE CIRCULATION SYSTEM

AT

THE UNIVERSITY OF AUCKLAND.

T.P,Warren,

Because New Zealand is essentially a maritime nation, the Zoology Course at the University places particular emphasis on Marine Ecology and Biology. It follows that the study of many animals in their live as well as natural state is highly desirable, and for this reason a relatively efficient system is incorporated in the Department for keeping large quantities of animals alive and available for instant study over considerable periods of time.

The Marine Circulation Room is located in the Zoology basement where much of the "behind the scenes" life of the Department takes place. The room itself measures 12 feet by 8 feet with a reinforced ceiling overhead to house the main reservoir tanks, each capable of holding 100 gallons. These are connected to one another so that Tank 1 flows into Tank 2 which in turn flows into Tank 3 at a slightly lower level. A gravity pipe leads from near the base of Tank 3 down through the ceiling to a stopcock. This connects with a horizontal pipe fitted with 9 Polythene taps, each of which can be fitted to a 4 gallon Perspex tank via short pipe leads. The small tanks are designed to overflow through built-in standpipes to a long black-painted trough measuring 8 feet long by 2 feet wide by 18 inches deep. It occupies most of the length of one side of the room. Above is a platform at waist height with movable wooden slats upon which stand the individual Perspex tanks. It may be mentioned here that all the woodwork is strongly coated with fibreglass to prevent corrosion or contamination, while for the same reason all the piping is of Polythene. The stopcocks and pump parts in contact with the seawater are of plastic derivatives or stainless steel.

The bottom of the main trough is slightly sloped and at its deepest end contains a standpipe leading to a 100 gallon settling tank located at floor level against the opposite wall. Over it is built a black-painted self draining platform with a black wall surround, and an overhead stopcock from the main reservoir tanks. Here, large specimen tanks may be set up with increased aeration facilities, while the black background is especially useful for the close up photography of living animals.

The remaining space on this side of the Circulation Room is occupied by overhead shelving to store tanks and other equipment; below is a stainless steel bench and sink unit with built-in drawers and cupboards. Here also is the main pump which is a Brennan rotary type consisting of a stainless steel worm running inside a polythene Stator; the whole driven by a quarter horsepower electric motor. An automatic mercury float switch is installed but seldom used as we prefer to adopt continuous running, by doing so the whole volume of water is in continual circulation and theoretically turned over every twelve hours, thus creating a "tidal" effect.

By being continually aereated the water is a good deal better for animal life than that in many parts of Auckland Harbour. To ensure that there is not too much animal matter in suspension we like to keep a permanent live supply of filter feeders, e.g. Pomatoceras carinifera (the common Tube Worm), and Actinia tenebrosus (the small red Anemone). Over the reservoir tanks is a double Neon tube burning night and day. This encourages the growth of surface algae and helps to keep the water clean. It is only on extremely rare occasions that the whole volume of water needs changing. Our present routine is to collect 100 gallons every fortnight; this we do by taking a portable plywood and fibreglass tank and an electric pump in the Departmental van to Okahu Bay. The 100 gallons of fresh seawater is introduced to the system via an auxiliary pump and as it enters, so 100 gallons of the existing supply is displaced into the main drains. This method has proved entirely satisfactory at all times. A slight amount of evapouration inevitably takes place but as the salinity and temperature are tested every day or two we find that any change can be rectified by topping up the supply with de-ionised water.

Regarding the marine life itself, much depends on the Laboratory requirements at any given time. During the Physiology Course, for example, we have to keep continual stocks of at least two dozen each of Perna canaliculus; Leander affinis (the common marine Shrimp); Isocradactys magna (the big West Coast Anemone); Platynereis australis (a sand dwelling Polychaete worm); and Hemigrapsus edwardsi - the common purple rock crab.

The Platynereis are housed in one tank containing an inch or so of sand. On top of this live the Isocradactys, some attached to the (interior) sides of the tank and others on small Perspex plates. The Leander and Hemigrapsus are both scavengers, and though useful for disposing of surplus refuse they must be housed in separate lidded tanks, otherwise they prey on other animals we may require sooner or later. The Perna live in the large trough and require continual replacement as we use them not only for experimental work but also to feed other animals. For feeding the crabs and shrimps it is simply a matter of breaking the mussels into a few pieces and dropping them into the tanks; the anemones must be fed individually by placing a piece of mussel flesh into their mouth cavities with long tweezers. After a while they become used to this and require no coaxing whatsoever. The Physiology Course occupies two Terms and the supply of experimental animals has to be maintained for at least six months of each year so as to overlap the Examination as well.

The Invertebrate Option for Zoology is alternate years and it so happens that 1965 is one of them. During the First Term the Stage One Labs. required at times such things as 250 Lunella smaragda; 100 or so of Thysanozoon (the swimming marine Flatworm); 200 Perna canaliculus, 50-100 Alcyonium (dead man's fingers); similar numbers of Sertularia (mussel beard); Flabellum; numerous demonstration molluscs including Pelecypods and Chitons; Sabellaria and similar marine Worms; Opisthobranch molluscs, Tunicates; Polyzoans,etc..

Not only does this entail a large collecting project, but accomodating the material until required is quite a job. Mostly the Labs. are organized with an eye to suitable tides as far as possible, and we collect during the previous few days. Nevertheless, the animals have to be maintained sometimes for a week or so and some losses are inevitable, though fortunately rare. There is the extreme occasion when the pump breaks down, but we always carry a full range of spare parts and the Workshop Technician soon has it going again.

During the Second Term there was a series of Molluscan Labs. for Stage 2 and 3. This meant collecting about 100 specimens each of Melanopsis, Siphonaria, Amphibola, Cellana, Melagraphia, Scutus, Dendrodoris, Neothais, Marinula, Zeacumantus, Mytilus, Crassostrea, Chione, Macomona, Maoricrypta, etc., to dissect all the main groups; besides, a quantity of other species for demonstration purposes. Half of the collection was required for Monday and Wednesday streams, the remainder for Tuesday and Friday, so the specimens had to be looked after for upwards of a week. Casualties were very few and the course passed off without a hitch. Oddly enough, the Pulmonate Siphonarias seem to be the most delicate of those mentioned above when it comes to maintaining them in circulation. In the end we had to fill a tank with clean stones (of which we have a permanent supply) and run a very slow flow of water as the animals showed a tendency to drown if submerged for long and nothing could induce them to move up the sides of the tank clear of the water, probably because of light sensitivity. However, they did crawl on to the stones to our relief.

Following the Molluscan Labs. were several others including work on Crustaceans, Sponges, Coelenterates and Echinoderms. For each of these we had to supply 80 - 100 examples of appropriate living material, some of which caused a few anxious moments. Sponges can be a problem as they are bulky and if a few specimens die amongst the multitude they quickly become foul and pollute the whole system. This means the whole collection must be gone over twice a day, and as some species contain quantities of mud the water soon becomes cloudy and takes quite a time to clear again. During the Echinoderm Course, the common rock star Patiriella regularis preyed on the Molluscs awaiting the Practicals later on. The big sand star, Astropecten, was another problem. We brought about 50 from Whangarei in August and for the first few days all seemed well until we discovered that some of the ones in the large trough (which at that time had about an inch of sand all over the bottom) were crawling into the sand and dying. This meant constant census-taking as a dead Astropecten decomposes very quickly and trying to remove a foul-smelling body from the sand without too much disturbance to the surroundings surpasses description.

Once the Term Laboratory Courses are finished it is necessary to dispose of all surplus material and give the whole system a thorough cleaning to prepare for the Practical Examinations at the end of October.

For the Practicals a large list of requirements is prepared in advance, but collecting means a hectic few days as the material must be available in time, and the tides and weather make detailed planning necessary particularly as animals from both East and West Coast localities are required. As fas as possible we try to have four couples visit a similar number of localities, each with a list of requirements from each area; this works quite well with the minimum of duplication and overlap. This year we ended up on a Wednesday evening at 6.30 p.m. with all the specimens needed for Thursday morning as ordered, but with every available inch of space in the tanks crammed to bursting point.

Now that the Academic Year and the Exams are all over the pressure is off and the System is running at minimum capacity. The main collection in the tanks at present consists of Molluscs for Mr.Ponder's Stenoglassan research and dissections -- Penion, Buccinulum, Neothais, Murexsul and Alcithoe. Besides these there are a few Nudibranchs and their eggs and larvae; together with the permanent populations of filter-feeders and scavengers. From time to time there are other animals in and out for study and display or photographing; but at least there is also a few weeks' respite before collecting begins again in preparation for the start of the 1966 teaching year.

--oOo--

Editors: N. & N. Gardner.

P O I R I E R I A.

Vol.3. Part 2. March 1966.

AN UNUSUAL OPPORTUNITY

Stan Turner.

Recently, from a trawl net which had been set in about 30 fathoms north of North Cape, I was able to collect a variety of sponges and sea growths.

As the area had not been trawled before to my knowledge, and is renowned as a sponge bed to be avoided by trawlers, I took the opportunity of collecting up most of the likely looking debris. Each piece I washed thoroughly in a bucket of water. When the residue was sieved and sorted, the contents appeared to be very interesting and this proved to be so after being identified by Mr.Gardner.

A list of the species present is :-

Cosa costata (Bernard)
Kidderia aupouria Powell
Cuna manawatawhia Powell
Pleuromeris latiuscula benthicola Powell
Nobolira cochlearella Powell
" contigua Powell
" affinis Powell
Merelina sp.
Rissoina achatinoides Powell
" powelli Finlay
" larochei Finlay
Alipta crenistria (Suter)
Joculator sp.
Ataxocerithium huttoni (Cossmann)
Zemitrella stephonophora (Suter)
" regius Powell
Marginella larochei Powell
" ficula (Mordoch & Suter)
Closia maoria Powell
Neoguraleus tenebrosus Powell
Austrodiaphana maunganuica Powell
Balcis sp.
Serpulorbis maorianus (Powell)
Badenia semireticulata (Murdoch & Suter)
Austronoba cf. oliveri
Austromitra n. sp.

The best treasure of all was a tall slender little shell, with red apial stripes considered by Dr.Powell to be a new Genus and species for New Zealand. We had previously found two others at Cape Maria in shell sand.

—oOo—

IREDALINA - OUR GOLDEN VOLUTE

N.W.Gardner.

This is undoubtedly our most sought after volute and the one referred to by volute fanciers as the golden volute - a name that fits it very well for its colour does resemble that of the golden cowrie.

Unfortunately, it is a shell from very deep water and is therefore not often obtainable.

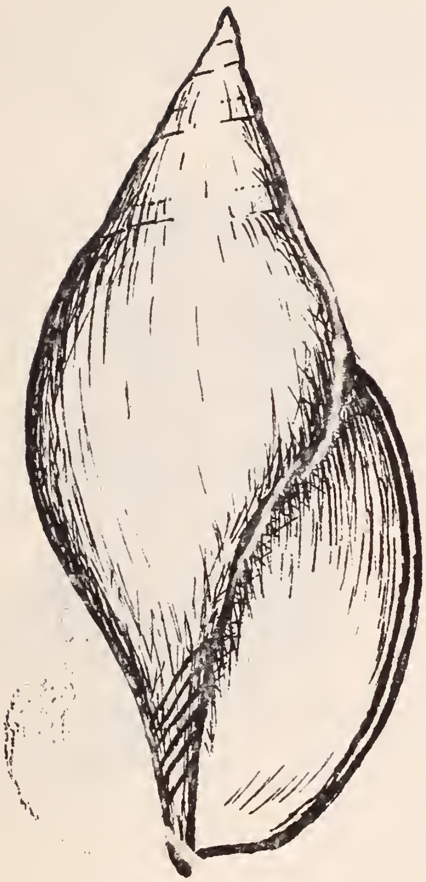
It was in 1926 that Finlay described the first *Iredalina mirabilis* which remained unique for 25 years. Since 1950 further specimens have been brought in by commercial fishermen but good live taken examples are still extremely rare. In Auckland Museum Records 1954 Dr.Powell described a second species *Iredalina aurantia* from Cape Saunders as "- smaller than *mirabilis*, more inflated with a spire angle of 44 - 52° and about 10 raised spiral threads running around the pillar" . Fig.1. Specimens of this inflated shell are known from Otago Heads, Timaru and off Banks Peninsular.

More recently specimens of *Iredalina* have been trawled from very deep water off the East Coast of the Auckland Province. All seem to be referrable to the slender *mirabilis*. A broken specimen is recorded by Dr.Dell in the Trans. Roy. Soc. Zoo. 20 1963, from 17 miles N.E. of the Cavalli Islands in 260 fathoms. This example has the spiral threads on the pillar, not normally present in *mirabilis* and leads Dr.Dell to consider that probably only one species should be recognised.

Lately, three further North Island examples have come to light, taken from the Bay of Plenty in 150 fathoms. Two of these are in the Turner Collection (Fig.2 is of one). Both are smallish shells, both of very slender outline, both well indented at the lower sutural region and have the usual 10 spirals on the pillar attributed to *I.aurantia*.

Although quite shiny in appearance the smooth high glaze of *aurantia* is not apparent; rather are there a series of growth lines of irregular strength.

These two shells posess a glazed apical spike of notable size which the writer has never seen in *aurantia*. This spike is very similar to that which is seen in the South American Volute *Zidona angulata* Swainson.



1.

2.

1. Iredalina aurantia Powell (spire angle 50°)

2. Iredalina mirabilis Finlay (spire angle 31°)

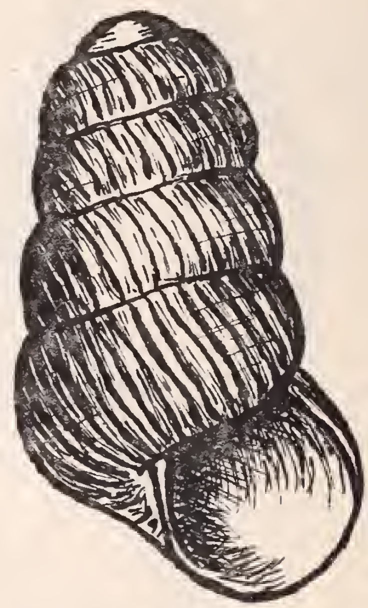
Both Figures actual size.

PHENACHAROPA.

N.W.G.

Members on collecting holidays around the East Coast of Northland, especially near Whananaki, should watch out for a rather novel little land snail which is often found sheltering in the fallen nikau fronds in the small patches of bush in gullies near this coast.

This is Phenacharopa novoseelandica (Pfeiffer) (Pheno meaning similar to) which has developed a turreted shell, the only one in a family of about 70 species, all more or less discoidal, to do so.



Suter records in his Manual, - from Gisborne Southwards along the eastern side of the dividing Ranges.

The late Mr.Brookes collected this species from Hen Island (under loose bark) and it has also been found near Whangarei though it appears to occur more commonly around Whananaki.

---oOo---

Dr. Rosenbaum writes :-

" In the November number of Tuatara appears an article by Michael Howell: "Notes on a Potential Trematode Parasite of Man in New Zealand".

He found in about 4 specimens of Zeacumantus subcarinatus, larvae of a fluke, which is normally parasitic in the eye-socket or gills, but which has on rare occasions been found in man".

---oOo---

AN ODD FEATURE.

N.W.G.

Why is it that some of our minute land snails produce such odd external processes on their shells?

One that comes to mind is Phrixgnathus regularis (Pfeiffer), a dwarf of about 3 mm. Just recently, I sorted out from leaf mould from Owhango in the King Country, some perfect live examples showing this feature at maximum development.

The illustration (of a not quite adult specimen) shows this ornamentation in the form of a row of bristles at the peripheral region, while higher on the whorl a series of elongated appendages, broadening out into spoon shaped ends, stand erect.

Old adult specimens tend to be denuded of this arrangement, but younger examples are certainly oddities.

Phrixgnathus regularis (Pfeiffer) does not occur with any frequency near Auckland but is not unusual in areas adjacent to the main mountain ranges in the centre of the North Island and in Taranaki.

--oOo--

A further record of a 'Northern' shell has been made with a fine specimen of Philippia lutea which turned up among shell sand at Mahia Peninsular, North of Poverty Bay. As far as we are aware, this is a good deal further South than any previous record.

--oOo--

Mrs. Parker of Blenheim writes :-

" Since I last wrote we have had a most successful holiday over at Pakawau. Piles of the lace cockles - nice big ones, also over 300 live Phenatoma novaezelandiae.

We arrived at the beginning of a howling southerly that lasted three days, and which I braved to collect. It was then that most of the good stuff came up. And the rest of the time the weather was grand and my beach jaunts wonderful. The family was particularly longsuffering, and happily gave me as much time on the beach as I wanted. Shelley developed measles, but only mildly, and our expeditions were disrupted for only two days. One little incident, or series of incidents really, gave me frustration, but also a good laugh at our breed. There was at the camp a delightful lady that does beautiful shell work. Unfortunately she too had an eye for those lovely notched tower shells, Phenatoma novaezelandiae and was in the habit of strolling down to the beach before breakfast. The first time I met her, she was returning with not far short of 50 in her bag, while I was scratching to find a dozen. She had beaten me. So the next morning I was up earlier, and again I met her coming back. GrrH. The next morning I woke with the sun, but blow it she had beaten me again. The NEXT morning I was up before light and still rubbing the sleep from my eyes and without my early morning cuppa, I stumbled down to the beach. It was barely light BUT (you've guessed) there was my arch enemy coming back along the beach. How did she do it. She must have taken a torch. You know, it was just like the three little pigs. Remember how each morning the wolf found that the biggest little pig had beaten him to it? Well that was us. Next morning I slept late, didn't even go down before breakfast, - and so did she. But I still did pretty well, because they started coming in in the afternoon. The shells that is.

But listen to this, I'll bet your hair will curl. I asked Mrs.Blick about the land snails for which the area is renowned. She gave me directions to get into the Mount Burnett area, but said they didn't welcome visitors, and I might be best if I went over the weekend when the Dolomite works may not be working. Now I feel strongly, as all we people who go on other peoples property should, about seeking permission for access, so I had every intention/if I of asking may go. However when George dropped me off at the gate, intending to come back two hours later, and I set off along the track to the bush, I came to a large notice "Positively no admittance". But it wasn't on the road I wanted to take, it was on the road leading to the factory itself. So I kept going along a lovely vehicle track that seemed to me more like a scenic drive. I should make it clear that in my ignorance I had no idea what dolomite works were, or that the prohibition was for my own protection from blasting operations. Anyway my son and I walked about ¼ mile along this lovely track without meeting anyone, until we came to the first bush clad gully. Not very hopefully, and rather fearfully, for I have no love for creapy crawlies, we climbed into it. I found my first shell immediately, and in an hour or so we spent there I collected 40, I repeat 40 A.1. dead shells, and two live ones. Also about 10 that were still good, but a little eroded at the tops, Paryphanta gilliesi. It seems that the heavy rains of a few weeks before must have washed them down. Was I excited! You can imagine it. So now I am building a collection of snails. "

--oOo--

PRESERVING SEA-STARS

Norman Douglas.

SUMMARY.

Preserve in formalin and dry specimens in total darkness or their brilliant colours will be lost.

INTRODUCTION

When shelling, sometimes a conchologist comes upon some most striking forms of sea-stars and the urge to preserve them for future reference is very strong indeed. Unfortunately the initial effort in doing this usually results in a disappointment. And, just as regrettably, perhaps a specimen of a very rare species is either lost or spoilt in the process. Preservation by keeping the animals continiously emmersed in a formalin solution does have some very special advantages to the scientist. However this method is neither very convenient in some cases nor does it allow the examples to be very readily displayed in others. The following drying method is suggested therefore as a system worth trying and the average collector should find it both easy to do and satisfactory in its accomplishment.

APPARATUS REQUIRED.

Most of the items used are to be found in daily use in every household so they hardly need be mentioned. However the following should be kept on hand.

(1) One or two photographer's developing trays. These are available in both plastic and enamelled forms. A tray about 14" long 12" wide and 2" deep will be quite suitable for most requirements.

(2) A quart bottle of formalin. Care should be taken not to inhale too much of the fumes from this mild poison as some people are very allergic to it.

IN THE FIELD.

While in the field great care must be taken with some of the star-fish as they are very brittle. In fact one might almost be led to believe that some of the brittle-stars shed their legs by merely looking at them! It will help if these kinds can be slowly induced to crawl over the open hand whereupon the hand can be slowly sunk under the seawater in the bucket.

AT HOME.

Having brought home the prize in a bucket of sea water, the next job is to persuade the animal to extend itself into a flat position. In the case of the Reef star (Stichaster australis) the animal is stiff and hard, while, as mentioned previously, the brittle-stars are extremely well named. First introduce the animal into one of the photographer's trays into which some of the sea-water has been poured from the bucket. In the case of the Reef Star it is likely to be in a most grotesque position, so leave it alone for a while. It will slowly flatten out to suit the level bottom of the tray. In the case of the brittle-stars the main thing is to get it into the tray unbroken.

Now turn on the hot water tap and slowly change the sea-water in the tray to fairly warm fresh water. The water need be no hotter than one can easily bear the hand in, yet it immediately kills the star and it relaxes its arms completely and to a most surprising degree. In this condition the final arranging of the limbs to their required positions is easily accomplished. Next pour off some of the water and add formalin from the bottle. The exact quantity does not appear to be very critical, but somewhere between a 10% solution (one part formalin to nine parts water) and 50% will be found quite satisfactory. It is, of course, better to err on the strong side. Let the star soak in this solution for several days when it will be ready to take out and dry.

CLEANING AND DRYING.

Slide the star out of the formalin bath onto a piece of stiff cardboard or hardboard. Next hose off all dirt from the specimen, taking care in some cases not to damage it with too strong a jet. Again slide the specimen on to a piece of dry hardboard on which it is to dry into its final shape. It is an advantage not to have the hardboard much wider than the specimen. In the case of brittle stars, tape the arms to the hardboard with very narrow strips of cellotape, with some paper under the cellotape where it crosses the arms. In the case of the Reef Star, string can be wrapped around the whole assembly to hold the limbs out flat on the board.

DRY IN DARKNESS.

Now comes a very important part. The specimen must be dried in total darkness, not just in the shade, or the brilliant colours will fade away. The writer has found it successful to cover the specimen completely with layers of cloth held in place by wrappings of string, then hang in a shed to dry. The drying may take several months, but it will be well worth the wait. It will be an indication of a good job of work if, when dry, the specimen has not lost an iota of its original colour.

STORAGE.

A cabinet with tray storage is recommended, for it keeps the specimens both clear of dust and away from the light. Sunlight is the greatest bleaching agent in the world.

Rather than use cotton wool for the tray bottom, or tray lining, it is suggested that Moleton cloth be strained over a sheet of cardboard. It has the advantage of cotton wool in preventing the specimens from sliding about, yet has no fluff to adhere to them. Moleton cloth, commonly used for dressing gowns, is available in various colours. A plain blue makes an attractive background for multicoloured sea-stars.

Brittle stars, on the other hand, need some further protection. It is suggested that Ivoryboard, a heavy form of cardboard used by carpenters for lining rooms, makes a useful backing material. With paste and coloured paper, cover over a section of this, then, when dry, cut it into small squares to suit the size of the stars. If the thoroughly dried specimens are placed upon this and the whole assembly covered over with cellophane paper, cellotaped at the back, they will be easy to see, easy to handle, and kept free from all dust and insect visitors.

---oOo---

Obanella :-

Is a genus of three species of very small land snails which has hitherto been considered to be of southern distribution.

The genotype, Obanella spectabilis Powell 1928 (originally placed in Egesta) was described from specimens taken at Nelson. Later in 1952, Dr.Dell recorded the occurrence of this species in the Rimutaka Range.

Just lately the same snail has turned up in leaf mould samples from two more northern areas.

The writer secured numerous examples from the foothills of the Ruahine Range, inland from Mangaweka, December 1965. These specimens have the peripleural processes very well developed.

More recently, Mr.Goldstone has sorted out several specimens from material from Hunua Range - rather a surprise to find on ones doorstep. The Hunua specimens, while having the normal distinctive axial plates at the periphery, do have a very high spire and would warrant closer study.

An illustration of this shell appears in Dr.Powell's "Shells of New Zealand" Plate 27, figures 13 and 14.

N. Gardner.

---oOo---

In view of the fact that we are rather short of material for this issue, we reprint notes from talks given in earlier times which present members probably have not seen :

"THE ORIGINS OF THE NEW ZEALAND MOLLUSCAN FAUNA"

MR. C.A.FLEMING. 8/6/39.

Mr.Fleming gave an account of the general origins of the entire fauna and flora of N.Z. of which the following is but a short extract.

"In Triassic and Jurassic times N.Z. lay largely beneath an arm of the sea east of a continent covering Australia. Of material of ocean floor central mountain systems of N.Z. were later built up. Seas not suited to abundant marine life but here and there fossils of Triassic and Jurassic age can be collected. Typical molluscs were Trigonia, Astarte, Pecten, Inoceramus, Aucella, Oxytoma, Belemnites and Ammonites and a host of Brachiopods. This fauna is in no way ancestral to modern faunas but is of type found throught ancient Tethys Sea.

The period following the Jurassic, the Cretaceous is exceedingly critical and important in history of N.Z. This is period when N.Z. offered land bridges to North and probably to South for colonisation by land forms as well as animals spreading along a shore line. Here we find an Indo-Pacific strain among our molluscs and forms which are largely ancestral to our recent fauna. Here we find the ancestors of Turritella, Cirsotrema, Struthiolaria, Polinices, Neilo, Limopsis, Panope, Cucullaea, Acteon. The continental mass of Greater New Zealand then began to sink and the TERTIARY period began. Molluscs flourished - there were hardly any immigration of molluscs to N.Z. but towards the end of the period we see the dying out of many very distinctive Tertiary genera such as :- Cucullaea, Limopsis, Polinices, Zelandiella, Hima, Marshallena, Olivella, Eucrassatella, Spisatella, Pedolion, Cardium, Lutvaria and older Pecten genera.

It seems that connection with the North was again established in the Tertiary. We may suppose that Paryphanta, Rhytida and Melanopsis reached us at this time. Placostylus was a later immigrant from the North.

In the Nukumaruian beds although Lutvaria and Polinices appear for the last time in our fauna, we find a noteable addition to the dominant mollusca - Zethalia zelandiae which appears suddenly in great numbers. From this time on through the Castlecliffian a number of important species are found for the first time. Members of the Cymatiidae and Naticidae of Australian affinity or identity and Pectens of the Notovola type. These are Australian types which have not previously occurred in N.Z. Their occurrence is possible due to a change in the direction of the East Australian current since most of these forms are suited for transportation in a larval stage by Ocean currents. The subantarctic west wind drift has influenced our molluscan fauna by bringing about the occurrence of the giant bull kelp and its inhabitants-

Photinula and the N.Z.Margarella as well as Nacella and Kerguelina in the Subantarctic Islands. We then have the following main origins for our fauna.

1. Cretaceous Indo-European ancestral stock.
2. Northern Land Mollusca.
3. Notonectian (Australian) Element.
4. Subantarctic west wind drift Element.
5. Accidental or chance arrivals.

--oOo--

SHELLS AND PRIMITIVE CULTURES

18.7.46. by D.G.Forsyth.

In the short amount of space available it will be possible for only a cursory treatment of the subject. It is hoped, however, that members will be spurred on to searching these things out more fully for themselves.

These notes are essentially a compilation of facts and ideas. No claim to originality is made - I am indebted to many sources for my information, the most important one being "Shells as Evidence of the Migrations of Early Cultures", by J.W.Jackson.

1. FOOD

Undoubtedly one of the first uses of shellfish was as a food. In many places of the world - including N.Z. - piles of shells have been found in kitchen middens. The Maori consumed a large variety of species.

2. TYRIAN PURPLE

The shell purple industry probably originated in Crete, where it was practised as early as 1600 B.C. Banks of crushed Murex trunculus shells have been found at Kamares in association with pre-Phoenician vases.

The main shellfish used were Purpura Haemastoma, Murex trunculus and M.branderis. A sac containing colourless dye was removed and boiled for ten days. The fabric was steeped in it. Then, when placed in the sun, the colour changed from yellow through greens and blues to a purple-red of great durability. A double treatment at Tyre produced a more vivid hue.

The Phoenicians established important fisheries throughout the Aegean and Mediterranean.

It took 12,000 shellfish to produce 1.5 grms. of dye. Real Tyrian purple was so expensive that it was reserved for kings, priests, etc. It was a sign of royalty in Greek and Roman times, and was also used for books, paints, rouge.

The industry was also established in West Ireland and Cornwall. Several places in Central America on both coasts carried on the work. Natives, instead of killing the animals, pressed the operculum, so forcing out a few drops of fluid, and then replaced the shell on the rocks. Used in ancient Mexican manuscripts.

3. SHELL TRUMPETS

The Minoans of Crete used shell trumpets largely in religious ceremonies.

The sacred chank of India (Turbinella pyrum) figured largely in the religious life of the Hindus. It was blown to summon the god's attention, by a man preceding the priest bearing the first fruits, at marriages and deaths, etc. Vishnu is represented as killing the demon that lived in the chank by cutting off its head, and hence the apex is always knocked off the chank. Divers collected them in 2 - 3 fathoms off Tuticorin from October to May. In 1885-6, 332,000 specimens were obtained. Sinistral examples were extremely valuable.

Sinistral specimens were specially reverenced in China - stored in pagodas and blown to still the waves.

Some shells used in the Pacific are Triton, Cassis, Strombus and Ranella. They were used widely in initiation ceremonies. In Samoa, before going to war the priest blew a conch and a rough hollow sound was an ill omen. In the Solomons the blowing of the conch heralded the return from a successful head-hunting expedition.

The Aztecs represented their Moon God by a conch. Once or twice a year the priests would blow their trumpets at noon and everyone would bite their tongues and ears to present the blood to the sun. A somewhat similar ceremony was enaced by the sun-worshippers in Indonesia.

The Incas had vessels decorated with pictures of people blowing shell trumpets.

The Maoris knocked the apex off and added a carved mouthpiece. Elsdon Best tells us that this "pu tatara" produced a doleful sound and it was used for signalling purposes as in times of war.

4. PEARLS AND PEARL SHELL

Egyptians probably were the first to use pearls. From about 1500 B.C. Egyptian women wore pearl earrings.

The early pearl fisheries were the Gulf of Aden, around Zanzibar in East Africa, and the Persian Gulf. The latter was famous from very early times - well known in the time of Alexander. Leading women of the Medes and Persians wore about three pearls strung on a ring through a nostril. Fashionable women of Astrakhan in the eighteenth century did likewise.

The Romans used pearls very extensively for decorative purposes - temples, chariots, dress, furniture, etc. Pearls from fresh water mussels throughout the British Isles and Europe were collected.

A curious notion, very widespread in early times, was that pearls were formed by rain drops falling into the gaping valves of the pearl shell.

Powdered pearls were valued for medicinal purposes, especially in India and China - cures lunacy, leprosy, etc.

A curious custom prevalent among the Hindus, the Chinese, the Japanese, and the mound builders of the Mississippi Valley was the placing of pearls in the mouths of the dead.

Enormous quantities of pearls were found in the temple of Tolomecco in Florida - containers full of them.

Montezuma's temple was decorated with pearls, and the main source of wealth to the Indian chiefs came from the pearl fisheries down the Pacific coast.

A Chinese prince of the 13th. century is accredited with first making artificial pearls. Mussels were kept in bamboo cages in water and matrices of mud pellets, images of Buddha, etc. were introduced.

Pearl shell is used extensively for decorative work throughout the Pacific. The Solomon Islanders ornamented bowls, canoes, weapons and the wooden heads on head-hunting canoes with beautiful inlaid shell work. Breast ornaments were made from large shells. The use of paua shell for green flashing eyes in Maori carvings is well known.

5. SHELL MONEY

(a) Cowrie: *Cypraea moneta* and *C. annulus* were probably among the earliest forms of currency. No laborious process was needed for their manufacture. Although they came from Indo-Pacific seas their greatest zone of circulation was in western Sudan and Guinea Coast. Used extensively there in the 14th century. Used largely by the slave traders in 17th and 18th century, but later replaced by English gold and other articles.

The Baganda tribe of Uganda used cowries as currency from an early date. When they were first introduced 2 shells would buy a wife, but later the bridegroom would give as many as 2,500. At one stage a cow was worth 2500 , a goat 500, a fowl 25, and a 62 lb. ivory tusk 1000.

Before the time of Alexander the Great cowries were the principal money in Bengal. Most came from the Maldives. As late as 1801 revenue from a British district was collected in cowries - considerable expense in converting them. A gentleman in the early

19th century paid for the erection of his house entirely in cowries. It cost £400, which was about 16 million cowries.

Cowries were used in China, but were forbidden as currency in 221 B.C.

(b) Wampum: Strings of cylindrical beads, each one laboriously manufactured from the white and purple on the valves of the Venus, pierced and strung, were used by the Indians as money from Maine to Florida.

(c) Allicochick: This money, used by the Indians on the Pacific Coast, consisted of strings of Dentalium. A slave was valued at from 25-40 shells on the string, depending on the condition of the shells.

(d) Shell Money in the Pacific: The manufacture of Melanese shell money was a laborious process. The red discs were made from Spondylus and Chama. The following steps were recognised in the Solomons:- Shells were broken and made roughly circular; the discs were ground flat by women rubbing them on a sandstone; a hole was made in them by means of a primitive pump drill; threaded on a thin stick and ground on a flat stone until discs were perfectly circular.

6. OTHER USES OF COWRIES

Symbolising the spirit of fertility, cowries were frequently worn on girdles by women in Abyssinia, Southern India and West Africa. The Masai women wore them in head bands until their first child was born.

In Ceylon, the Maldives, Burma and many other places they were used in games of chance - winning or losing by the way they fell (aperture up or down).

Cowries were used in initiation ceremony with the Human Leopard Society of Sierra Leone cannibals. They were attached to iron crosses in a medicine bag.

The Nagas of Assam and Djibbas in Africa wore them with hair from decapitated enemies.

In Togo and Dahomey cowries were placed in the grave with a dead person so that he would be able to buy food in the New World and pay the ferryman who rowed him across the "great river".

In pre-Christian times in China they were put in the mouth of the dead - a feudal lord 7, a great officer 5, an ordinary official 3.

7. ORNAMENTS ETC. IN PACIFIC

Shell necklaces were very common - many of the small brown land operculate, Helicina, which are bleached. Clam shell (Tridacna) serves many purposes - breast discs, shell adzes (on coral islands where there is no stone), large armlets.

Ovulum ovum is often worn in bands across the head, and decorated the high curved stern of the Solomon Island canoes.

The orange cowrie was a badge of high rank, especially in Fiji.

Placuna placenta was used for windows long before the use of glass. It was used in the East Indies, and some Canton houses were almost entirely lighted by windows made of these shells.

—oOo—

Editors: N.& N. Gardner.

P O I R I E R I A .

Vol.3. Part 3. June 1966.

FIELD DAY AT GREENHITHE.

N.W.G.

None of the bush which still exists on the North Shore of the Waitemata Harbour supports such a large list of small land snails as does, say, the Waitakere Range.

Nevertheless, some twelve or so members met in the field to try to find out just what existed at Hellyer's Creek area near Greenhithe. This area is of particular interest as it is the place where Henry Suter did quite an amount of collecting as you will have noticed in his references to it in his Manual.

Our afternoon's collecting produced the following 24 species :-

Omphalorissa purchasi (Pfr.)
Liarea egea (Gray)
Cytora cytora (Gray)
Cytora hedleyi (Suter)
Cytora pallida (Hutton)
Cytora torquilla (Suter)
Thalassohelix ziczag (Gould)
Serpho kivi (Gray)
Therasiella celinde (Gray)
" tamora (Hutton)
Phenacohelix giveni Cumber
Flammulina perdita (Hutton)
Ptychodon pseudcleioda (Suter)
" tau (Pfr.)
Charopa ochra (Webster)
" coma (Gray)
Fectola roseveari (Suter)
Mocella cogitata Iredale
Laoma marina (Hutton)
" poecilosticta (Pfr.)
" pirongiaensis Suter
Phrixgnathus cheesemani Suter
" glabriusculus (Pfr.)
Delos coresia (Gray)

Probably the best find of the day was Laoma pirongiaensis, a rare snail at any time and one that had not previously been recorded from the North Shore.

Hellyer's Creek is the type locality for Flammulina olivacea (Suter) and we had hoped that someone would have found an example but the only member of the genus taken was F. perdita.

--oOo--

ITEMS OF INTEREST.

Recently amongst a good washup of shells, Mr.Barker came across one live 5 inch Toheroa in a sandy pool on Onetangi Beach, Waiheke Island. It is most unusual to find a well grown specimen alive on the East Coast, though single valves have been picked up on this beach before.

Cherie Edwards writes :-

" I thought you would like to hear that I found a live Ellatrivia memorata at Taupo Bay. I was turning over a rock in a pool and saw what I thought was an orange slug. As I went to pick it up it fell into the clear water. You can imagine my surprise when I discovered what it was. I half filled my bucket with water and put it in. I watched the animal come out of it's shell. The animal was bright orange with a few redish brown spots on it. The next day it did not come out of it's shell so I pickled it in a weak solution of formalin."

In the South Island the large Paryphanta are being destroyed by the ravages of wekas. Somehow in the last 10 years or so the balance seems to have become upset and wekas have virtually wiped out a number of colonies. In some places hundreds of dead pecked shells have been seen. The birds do not miss any shells that are not well hidden under rotting logs.

John Marston writes :-

" When searching for Lepsithais squamatus in Balena Bay, just around Point Jerningham from Wellington's popular Oriental Bay, I came across some unusual shells. A yellow Naticid and 24 small Cerithiids. All being under one inch in length and mostly broken, suggested that they had come from warmer seas. The 8 valves of a Cardium looked common enough to many warmer regions, but 6 valves of a very solid bivalve looked most distinctive. Dr.R.K.Dell identified the latter as being Villorita Cyprinoides (Gray), one of the Corbiculinidae. This bivalve comes from brackish water in India

The occasional ship carrying sea sand as ballast accounts for some of the rare occurrences of foreign shells near some other ports, e.g. Tahunanui Beach near Port Nelson. Another region where shipping might not be suspected is Farewell Spit. Golden Bay residents and visitors are quite used to overseas ships sheltering inside Farewell Spit for a day or two. I am sure that their anchoring there, rather than the East Australian Warm Current, accounts for the few tropical shells washed up on the Spit. "

A notable recent find is that of a nice specimen of Particymatium strangei (Angas). This was collected by Murray Douglas on a recent trip to Northland and is the second known specimen from New Zealand. The first was recorded by Dr. Powell in 1933. This shell looks somewhat like Cabestanomorpha exarata.

Maorimactra is not listed in Dr. Powell's checklist as occurring in the South of the South Island, but it apparently does so. Mr. Douglas reports the finding of specimens in South Westland in 1963.

"They were found on weedy mud about one mile from the sea in the tidal estuary of the Hapuka River mouth (very near Turnbull River mouth, next bridge south on Haast-Jackson Bay road, South Westland). They were both sides of the road bridge and found dead. Tide was out. All were near the rushes of the river edge. I have four complete specimens and three halves. They are fragile but in very good condition with the epidermis up to about half way. "

Des. Ashton gives an account of his collecting activities in Western Samoa :-

" At Christmas time I am able to enjoy two months of collecting, fishing, skiing etc. The Airport where we live is 20 miles out of Apia and less than 100 yards from the lagoon.

Needless to say, with the unrestricted use of a motor boat, a lagoon with a boundless variety of collecting areas and two young energetic and extremely enthusiastic brothers, I get in plenty of active collecting.

Although the majority of my collecting incorporates skin-diving in sandy and rocky areas I also like to do a bit of night collecting and rummaging around the reef both by day and night. The reef is about two miles from the shore and keeping to the seaplane lanes to avoid coral, we are able to get out to it in a conveniently short five minutes. Just inside and bordering the reef is an extensive sandy area which abounds in Terebra, Conus and a few Tonna. The most productive rocky areas appear to be those in the reef passages. These are both deep and clear, and despite the currents, facilitate easy diving. In these areas I found an endless variety of species but alas the occasional visit of a shark, barracuda or the frequent rough weather often make this type of collecting impossible. Collecting along the shore, especially at night produces dozens of the more common cowries, cones and rock shells. The reef is only occasionally workable because of the high tides and unobliging winds but when we are able to get at it the result is always pleasing with many species both small and large, common and rare turning up.

Often I have tried (to me) a new technique sometimes with much success. A dredge dropped into the sand brought up small Mitres and Cones while an old tyre baited with rotten fish captured not only small Cones but also eels, octopi and small fish. The most successful method, however, was night diving. With a large (6 volt) waterproofed spotlight, a lantern in the boat and lots of apprehension we slipped into the water to be greeted by a myriad of different shells. Life never visible, or imaginable in the day erupted at night. The biggest problem was finding a container large enough to hold all the 'finds'.

One thing which I did notice was that what one day would appear barren and lifeless, would another day be extremely rich in shells and all other animals. While diving one can observe all the conflict within the water around. I have been very fortunate in seeing Conus killing and feeding on Terebra and the Terebra in turn on marine worms. In watching these things I am constantly nervous, making sure that I do not become part of the 'struggle for survival' by making a meal for some large predator!

The eventual result of my holiday was very pleasing. I added hundreds of new species to my collection. Unfortunately some have to remain in storage because of air freight limits.

Boarding school life with its constant activity tends to suppress hobbies but I still get a little time for classification etc. "

ERRATA :-

POIRIERIA. Vol.3. Part 2. Page 24.

3rd. Line from bottom: Read "4 per cent" instead of "4 specimens"

Last line from bottom: Read "of Gulls" instead of "or gills"

--oOo--

PRESERVATION OF RESERVES - FAR NORTH.

N. Gardner.

As a result of the complete destruction of goats on Three Kings Island, there has been a rapid regeneration of flora and a great increase in the native fauna. The magnificent Placostylus bolloni, which had been all but wiped out and existed in a few small pockets of the bush inaccessible to goats, has, over a period of 12 years, increased to the extent of an "explosion" in population. Where 25 snails were counted in the P. arbutus colony prior to the Land & Survey Department's action, a census three or four years ago revealed a count in excess of 200 adult specimens and very many juveniles coming on.

An area of great interest to the naturalist is the "Northern Block" in the far north of the North Island, where the majority of Placostylus colonies occur. A bad state of affairs has arisen partly through "burning off" but due mainly to the ravages of pigs. These have increased enormously in the last 10 - 15 years until now, most of the few remaining areas of bush, have been invaded and well rooted, by pigs. The ground in many places appears to be ploughed - and scattered all through are remains of crushed Placostylus with the occasional rare Paryphanta watti, squashed flat. In the Cape Maria area there is evidence of rodents, probably rats. These have gathered snails into nests and bitten the tops off Placostylus to get at the animal and chewed the juvenile shells back from the aperture. This has also been observed further south in some Placostylus hongii colonies.

Recently some areas have been gazetted as reserves which means that the collecting of live snails and other fauna and flora is prohibited. The only area really damaged by human agency is Mangapiba where both fire and over-collecting have about exterminated the colonies. It is to be hoped that swift action will be taken to elimate the pigs and that some area of bush might be fenced off so that the many uncommon plants as well as snails will have a chance to regenerate.

In some places it seems already too late but in others a few young snails are still surviving. Areas badly affected by pigs are Pandora, Unuwhao, Kahuronaki, Mawkins Nook and Whareana. So far, pigs have not invaded Kerr Point.

--oOo--

GOING BUSH IN SAMOA & TONGA.

L.Price.

This is the third, of a series of field trips, collecting land mollusca for the Chicago Natural History Museum. From October, 1965 to February, 1966, I spent almost four months in the Samoan and Tongas Groups - so come with me, Folks, on another island-hopping jaunt to the lovely South Pacific.

Leaving Auckland on October 23rd, by P.A.A., my first night was spent at the luxurious and expensive "Mocambo Hotel", Nandi. On next day to Eastern Samoa, where a night was spent at the "Rainmaker Hotel" in Pago Pago. Early next morning, I was joined at the airport by my sponsor, Dr.Alan Solem, when he arrived from Hawaii. Through a dense curtain of rain, we then took off for the last stage to the island of Upolu, Western Samoa, and were soon installed at the "Casino Hotel", Apia, which was our headquarters for the next three weeks.

Upolu is the second largest island of the Samoan Group. Of about 400 sq. miles in area, it is of volcanic origin, with a mountainous interior, rising to a maximum of 3608 feet on Mt.Fito. As the island lies parallel with the prevailing trade winds, rainfall is evenly distributed and heavy, ranging from 100, to over 250 inches per annum. Consequently, the vegetation is dense, with heavy forests clothing the slopes, and extensive plantations of coconuts, bananas, taro and cocoa on the lowlands, where most of the people live.

With the aid of the Department of Agriculture in Apia, we were soon ready to begin collecting, but our main problem was to find suitable transport. For the first few days, we had the use of a Department Land Rover and driver, but this was only a temporary arrangement. Though the local buses are cheap and run frequently, they stick mainly to the coastal road. What we required was extreme mobility, coupled with maximum collecting time in the field. Finally, we had to hire a taxi, with driver, by the day; rather expensive at £5 per day! (Samoan currency is based on New Zealand coins and Samoan notes.)

Although the tropical wet season was about due, the weather was very kind and during the first three weeks, we were able to get out collecting on most days. We concentrated mainly in the areas of primary forest, and this took us over much of the island, with best results in the mountainous interior, up to an altitude of 2500 feet.

About 40 species of land shells have been recorded from Upolu - we managed to locate many of these, with perhaps, one or two new species, including a slug. The most prominent items found were - 2 ground operculates, Ostodes; 3 tree dwelling Partula; several Helicina; 2 Succinea; several Trochomorpha; 2 glassy, tree dwelling, Diastole; 2 Lamprocystis; 3 Subulinids; several Endodontids, and an operculate, Omphalatropis.

By November 13th. our work on Upolu was almost complete and Dr.Solem flew back to U.S.A., by way of Australia, New Zealand and Fiji. Two days later, I moved on to the next stage - a two week trip over to Savaii, the largest island of the Samoan Group.

Savaii, at around 720 sq. miles in area, is almost twice the size of Upolu, but has a much smaller population. Of volcanic origin, it is also very mountainous, rising to a maximum of 6094' on Mt.Silisili. With a similar very heavy rainfall, there is almost a solid cover of forest, apart from an area of recent lava at the eastern end. Laid down only some 60 years ago, this lava field is still more or less bare, looking exactly like a sea of black, solidified tar.

Being rather off the beaten track, there is no tourist accommodation, or other facilities, whatever, on Savaii. Europeans are quite a rarity, so, wherever I paused near a village, there was a chorus of "'Palagi, 'Palagi", and within seconds I was surrounded by a crowd of kids, come to examine this queer, pale-faced specimen from over the sea ! Life goes on almost undisturbed, apart from such modern amenities as an odd general store, schools, churches and a small fleet of rickety buses, trucks and Land Rovers. Communication with Upolu is confined to frequent launch services across the straits, taking 90 minutes, at a cost of 9/- each way.

Before daylight on November 15th., I left Apia by taxi for the wharf at Mulifanua, joined the launch, and arrived at Salelologa on Savaii by 6 a.m. Armed with a letter of introduction, I eventually made contact with the local Agriculture Officer - a fat, smiling Samoan, with whom I stayed for the next few days. Luckily, this chap had a Land Rover and so was able to get out to good collecting localities during the course of his agricultural rounds. Most of my collecting in this area was done at an altitude of 100 - 900 feet. Although I was keen to get up to some of the peaks, I could find nobody willing to guide me into the almost trackless interior.

After a few days at Salelologa, I boarded a bus for the 63 mile run to Asau, around the other side of the island. This proved to be a 4 hour endurance test, thumping along on a hard wooden seat, over an appalling road - all for the princely sum of 4/6d. ! At Asau, the only transport obtainable was a heavy truck, costing, with driver, £4 per day. However, with the aid of a guide, I was able to head into the mountains, and reached a height of 2000 feet, where collecting proved to be excellent. After three days, I left Asau with my host in his jeep, and continued on around the island, back to Salelologa. Here I again stayed with the Agriculture Officer for another week's collecting.

Only about 8 species of land shells have been recorded from Savaii previously. However, my two week stay produced a total of 30 species. Most of them appear to be similar to those found on Upolu, though in general, specimens were much more plentiful.

On November 28th. I returned to Upolu and settled down for another week in Apia. Meanwhile, final details were fixed for the next stage - a quick trip over to Rarotonga, Cook Islands. A week was spent on Rarotonga, where I concentrated on gathering a further series of two new species of small land snails, which I happened to find during my last trip in 1964. This proved to be quite successful and so back again to Apia, where arrangements were made for shipping the Samoan collection away to Chicago.

Early December 19th. I said farewell to Samoa and took off on a Polynesian Airways D.C.3 flight for Tonga. Three hours later, though it was already December 20th., we reached the island of Tongatapu. At the airport, I met Mr.Tomasi Simiki, Chief Agriculture Officer in Nuku'alofa. Through his efforts, I was to get my collecting organised in the Tongan Group. As it happened, this was a very sad day for the people of Tonga, for late the same afternoon, a plane from New Zealand arrived, bringing the body of their beloved Queen Salote. Thus, I was an unexpected guest in the procession from the airport into Nuku'alofa, and a few days later, was a witness at the funeral of the late Queen - a moving and unique experience.

While in Nuku'alofa, I stayed at "Beach House", situated on the waterfront, a few minutes walk from town. This has been the only accommodation available for many years, though now, there is a new modern Hotel in course of construction, nearby.

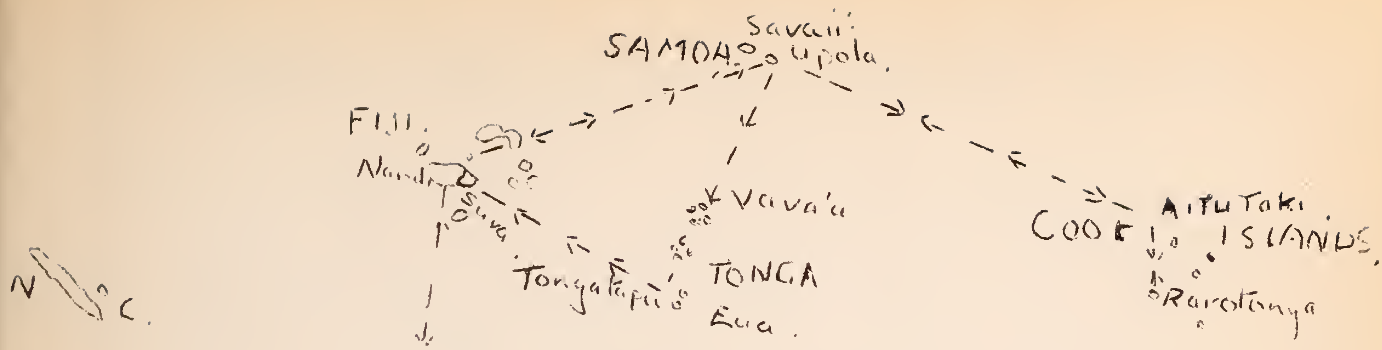
Tongatapu is rather a flat island, and intensively cultivated. Very little of the original vegetation remains, thus is fairly poor for the collection of land shells. However, despite rather dry conditions, I found species of <u>Helicina</u>; <u>Diastole</u>; <u>Omphalatropis</u>; <u>Lamellaxis</u>; a <u>Pupillid</u>; an <u>Endodontid</u>; <u>Lampracystis</u>; <u>Tornatellina</u>; and <u>Ouagapia</u>.

During a week at Nuku'alofa, I was able to book a passage on a small, interisland boat, which was due to sail for Vava'u - main island of a compact group, some 170 miles to the north. Luckily, the weather was good and the 20 hour trip uneventful. I shared a small cabin with a Tongan and had three tasty meals in the dining saloon - all on which cost £T4.5.0. (Tongan currency is based on Australian coins and Tongan notes - apparently, the notes are never withdrawn for renewal - like Old Soldiers, they just fall apart and fade away!)

Vava'u Island is about 30 sq. miles in area, composed of dark red soil, with occasional outcrops of jagged limestone. Around much of the coastline are steep limestone cliffs which are deeply undermined at the base by wave action. Rising from very deep water, the cliffs reach a height of 700 feet in places. Approaching the island, the boat enters a broad and deep inlet, studded with numerous islands - this gradually narrows, until about five miles in, the main village, Neiafu, is reached.

My headquarters for the next three weeks was a large wooden building, on the slopes overlooking the harbour. This "Government Rest House" contained offices below and accommodation for visitors on the top floor. My meals were prepared by the Tongan caretaker and his family. Although I was the only person staying there most of the time, it was far from a haven of peace. The main street ran along the front and there always seemed to be people talking and shouting at all hours of the night, while roosters crowed, packs of mongrel dogs barked and fought intermittently and to liven things up a bit, someone always rang the local church bell at the crack of dawn each morning!

As usual, transport was a problem. But I was lucky. After a couple of days footslogging, a young Tongan chap, with a small



1. 

2. 

3. 

Author's Route

1. _Ostodes._ 2. _Partula._

3. _Trochomorpha._

motorcycle, befriended me on the road. Thenceforth, the island highways and byways were covered at a furious pace. I was delighted, despite a corn or two on the wrong places !

Around the shoreline cliffs and on the scattered rocky outcrops, there still remains a dense cover of low forest and it was in these areas that my collecting was concentrated. Fortunately, the drought broke a few days after my arrival on Vava'u, so the finding of adequate live material was no problem. Around 17 species were found during my three week stay - all rather small, some examples being - 4 Helicina; 3 Lamellaxis; 2 Endodontids; 1 Georissa; 1 Omphalatropis; 1 Diastole; 1 Lampracystis; 1 Pupillid, 1 Ouagapia.

By January 22nd., the D.V."Hifofua" was ready to leave for Nuku'alofa. Really, I was lucky to find a place to rest my weary bones - on the dining saloon settee. Hundreds of people had the same idea and there were scenes of near riot, as would-be passengers swarmed on board - with or without a ticket ! Finally we got away two hours late, while several young chaps were turfed overboard, as we sped down the harbour. After a fast run of 17 hours, we reached Nuku'alofa early next morning.

Next on the programme, was a visit to the nearby island of 'Eua. Lying about 10 miles off the South East coast of Tongatapu, 'Eua is considered to be the oldest, geologically, and the only island of the entire Tongan Group, to have permanent streams. It is well forested, with a low range and steep cliffs running the full length of the east coast.

Meanwhile, the weather had turned nasty, with high winds and rough seas. After several days waiting, we were off. What a trip ! The seas were still mountainous, sheets of spray broke right over the boat and despite my waterproof coat, I was soaked to the waist. Even the coopfull of hens, lashed on the stern, looked pretty green around the gills - however, we pressed on, regardless and all aboard heaved a mighty sigh of relief, as we finally reached 'Eua, after three hours of purgatory !

Mr.Siale, the Forestry Officer, was at the wharf to meet me, and after drying out in the sun, I was soon feeling much better. Eventually, we piled onto a truck which took us several miles down the road, than came an hour's walk along a track to the Forestry Camp, at the foot of the main range. Here, I stayed for the next four days. I slept on a pile of mats and ate with my fingers, on the floor, Tongan style.

The location of the Camp proved to be ideal for my purposes, as it was only a few minutes walk to the top of the range - at this point, around 1000 feet altitude. Dainty tree ferns flourished along the streams, and a large species of stinging tree was common everywhere - I recognised this tree immediately, from past painful experience in Queensland.

As expected, land snails were quite plentiful, the largest being Eua globosa - a ground living relative of the arboreal genus, Partula. Other species included 4 Helicina; 2 Diastole; 2 Lamellaxis, 2 Endodontids; 1 Omphalatropis; 1 Trochomorpha; 1 Pupillid; 2 Lampracystis; 1 Georissa. In the streams, a species of Melania, and a species of Lenameria were common. Around 16 species of land shells came to light altogether from 'Eua.

Early February 2nd. I again boarded the tiny launch for the return trip to Nuku'alofa. With a huge barge in tow, loaded with 1500 cases of bananas, it was a slow, but uneventful roll of six hours duration.

During the next few days, some last minute collecting was done around Tongatapu, with the use of a hired bicycle. Then, it was time to be off, on the three hour flight to Fiji. While in Suva, the Tongan collection was stowed ready for shipment.

Finally, after several days doing the sights, I returned to Auckland, via Nandi, with a pocketful of "funny money", and minus a stone in weight.

--oOo--

MY GREATEST TREASURE - SCHIZOGLOSSA MAJOR.

B.Elliott.

On February 28th. 1966, while I was staying with Mrs.Bates at Taupiri, we decided to visit nearby Pukemiro to search for Schizoglossa major. The Records of the Auckland Museum give the locality of this rare subfossil snail as "½ mile S.W. of Pukemiro, Waikato, in limestone crevice with moa remains." When we reached Pukemiro we could not decide which direction was south-west, but undeterred by the light rain, we left the car by an old hall and climbed a nearby hill to try a likely-looking patch of bush. About an hour later we returned to the car, damp and depressed, without having seen a sign of any limestone or subfossils. No-one but snail collectors would be scrambling around in the bush on such a miserable day! I had found less than a dozen snails - one Suteria ide and a few Thalassohelix. We would have to make some enquiries, we decided. No use asking the local inhabitants where to find Schizoglossa major, but someone might know where the moa remains had been found, or where there was some limestone. Nobody did! But just then/~~we~~ when were almost ready to give up and go home, we called on a very helpful lady who rang up several of her neighbours, and then sent us off to a nearby farm, where, she told us, there was limestone. From the top of the hill there was a lovely view of Pukemiro, half a mile away. Just the right distance! We were still not sure of the direction, but lost no time in obtaining permission to explore the nearby limestone outcrops. It was not difficult to find bones - the limestone must have been the graveyard of dozens of sheep! But of moa boans, not a sign, and the only snails to be found were a few dead Helix aspersa. For more than an hour we searched high and low. At last Mrs.Bates said we had better go, as it was getting late. As we walked back to the car I stopped at a little crevice for one last try. Digging in the soft earth I could feel something hard, and pulled out something that looked like a flat piece of bone, nearly two inches long. It took me several seconds to realise that the "bone" was a Schizoglossa major, worn and slightly broken, but undoubtedly a Schizoglossa, and much bigger than I'd imagined it would be. My yell of excitement brought Mrs.Bates hurrying back, and with renewed enthusiasm we continued our search. Further digging yielded two Rhytidas (almost certainly greenwoodi), one complete and one broken. It was getting really late by this time, so we gave up the search and returned home. Two days later we went back to Pukemiro for another try, but after three hour's hard work our enthusiasm had diminished considerably. All I had to show for all that work was another broken Rhytida, a broken Serpho, a juvenile Liarea (all subfossil) - and a very sore thumb which a loose rock had rolled on !

46 x 30mm

The measurements given for Schizoglossa major in the Records of the Auckland Museum are 36 mm. x 26 mm. (holotype) and 40 mm. x 28.5 mm. (paratype), which leads me to wonder if my 46 mm. x 30 mm. specimen could be a record for size. As it is slightly broken on one side, it's true width would have been a little more than 30 mm. At a recent meeting I asked Dr.Powell if he had a Schizoglossa major, as I would like to see another to compare with mine. The specimen he showed me was considerably smaller than mine, but in very much better condition.

Although my Schizoglossa major is one of the most unattractive shells in my collection, I consider it is my greatest treasure.

--oOo--

REPRINTED from 'Australian Newsletter' January 1966, with due acknowledgement.

Extracts from articles in the Newsletter from the Malacological Society of Holland. Translater by J. Voorwinde.

EDIBLE SNAILS.

With the ever increasing import of edible snails into Australia, readers may find the following interesting. If one orders a portion of "escargots" in a Paris restaurant, one finds among the shells of Helix pomatia not rarely examples of Helix lucorum distinguishable by the warmer colour of their brown bands and the microscopic net sculpture on the periostracum. The reason is that during preparation some shells break and when the better restaurants prepare the snails with lots of butter etc., they swell and are sometimes too big to be put back in their shells. Other shells are substituted which are not always Helix pomatia. For that reason more than fifty million empty land snail shells are annually imported by France. Among the edible snails available in France are Helix lactea, ligata, lucorum, mazzullii, sicana, pericalla and testa as disclosed in the book, "Les escargots" by Jean Cadart (Paris, Lechevalier, 1955). The countries of origin in order of importance are Germany, North Africa, Austria, Switzerland, Italy, Yugoslavia, Lebanon, and Syria, the last one (the least important) exporting 136 tons of live snails to France. With these huge imports of live animals, the chance that they will establish themselves in France is not impossible, as proven by the following accident. According to a report in "Le progres" 9th.May, 1962 a canning factory Romanzini in the village La Riviere-Drugeon imported 12 tons of edible snails from Turkey. A government veterinary customs officer at the Border post at Verrieres-de-Joux ruled that only 3½ tons were suitable for human consumption and the rest had not travelled too well. The condemned 8½ tons of snails were dumped at the edge of a big forest. A few days later the good citizens of La Riviere had a marvellous time collecting in the forest thousands of snails which had arisen from the dead. Another curious incident took place as reported in Le Figaro, 19th April, 1965 describing a small border war between France and Switzerland caused by snails. The Swiss are more set to preserve the beauty of their countryside for tourism than the French. Frenchmen however have great delight in taking their family and friends on picnics where the main event is to collect snails on the spot and prepare them over an open fire. To that end the Frenchmen wander into Switzerland where they sometimes create quite an amount of damage especially if the excursion develops into a well organised hunt for the canning industry; the result was that for example the Kanton Neuchatel passed a law forbidding collecting snails, transporting them, having them in possession or to sell with the exception of scientific research or education. The French retaliated with a law forbidding the same things in relation to collecting wild narcissus, wild strawberries and mushrooms, a valuable pastime for the Swiss. Other Bordertowns and Councils created similar restrictions and, as far as we know, this small war is still going strong. And all that started with those innocent snails.

--oOo--

TIDES & THEIR EFFECTS

B. Dudley.

Tides are the movements of the ocean water in response to the pull of the stars, planets and satellites. Heavenly bodies attract or 'pull' one another and the size of this pull depends upon the mass of the bodies and the distance separating them. Of these heavenly bodies the moon and the sun have the greatest effect on our tides. The gravitational effects of these two act on every particle of the earth, but only the water is relatively free to move. Unlike waves, which disturb only the ocean's surfaces, tides move the whole body of ocean water. As a matter of fact, they also move the earth and air. Every time there is a vertical tide of 10 feet, the continents rise about six inches and the atmosphere bulges out towards the sun and moon to a distance of many miles. We humans contain much salt and water and each of us is also subject to this tidal pull; we actually gain and lose a fraction of an ounce in weight with each rise and fall of the tides.

Now the sun and moon each have their own tide-producing pull. While the sun is so much larger than the moon, it is also at a much larger distance from the earth so that the solar tide-producing force is only 3/7ths of the lunar tide-producing force. Therefore it is the moon that has the greatest effect overall on our tides; the sun's effect merely reinforces or decreases the moon's effect.

We know that the tides vary in height and we call them high and low tides. Sometimes we get very high tides and very low tides. The height of the tides depends on the way the earth, sun and moon are positioned with respect to one another.

Firstly let us consider the time when the earth, sun and moon are in one straight line and let us for the sake of simplicity imagine the whole globe is covered with water and no land. Now when the two bodies, the moon and sun, are in the same straight line, the combined effect of both their gravitational 'pulls' (or tide-producing forces) is very large. This large pull attracts the ocean waters and a bulge of water rises on the side of the earth facing the moon. At the same time an equal bulge forms on the opposite side of the earth. This bulge on the opposite side is formed because of two things. The first is the gravitational pull of the moon is much weaker as it has to exert its pull through the solid earth, before it gets to the ocean on the other side. The second and more important is that the spin of the earth tends to produce a force called centrifugal force (or outward throwing force) and this acts against the inward pulling gravitational force. This now leaves two great bulges on opposite sides of the globe and of course two thinner areas of ocean at right angles to these bulges (see Diagram A).

Now when the sun, moon and earth are in a straight line producing this extra large tide, we call these tides SPRINGTIDES. The three planets are in this straight line when we get full and new moons. We get full moon when the earth is between sun and moon and the sun's rays light up the side of the moon we are looking at. We get new moon when the moon and sun are on the same side of the earth and we see a large part of the side of the moon that is in its own shadow. Thus we get Spring Tides twice a month (Diagram B). Now as the days of the month pass the moon and sun become positioned so that they are at the corners of a huge right-angled triangle. When this happens the solar and lunar pulls partly cancel each other out and we have unusually small tides called NEAP TIDES. This occurs during the first and third quarters of the moon (Diagram C).

Therefore we can now put this whole cycle together and overall the picture is one of a mass of water quietly streaming along after the moon as it passes across the ocean. When we are at the beach we notice that we get two high and two low tides a day. Now high tides do not occur regularly every 12 hours but at intervals of 12 hours 26 minutes, i.e. if there is a high tide at 9 o'clock in the morning, the next will be at 9.26 at night and the next at 9.52 next morning. This is because the earth makes one complete revolution about its axis in an average time of 24 hours, while it also takes the moon 28 days to make one complete revolution of the earth. Now combining these two effects we get each point as being $\frac{24}{28} \times 60$ mins = 52 minutes later in position each day. But during this time a place will also experience a high tide on the other side of the earth away from the moon. $\therefore$ half of 52 minutes = 26 minutes $\therefore$ every new high tide is 12 hours 26 minutes after the previous high tide.

Let us not forget that this has been very simple description and now we must see what changes will take place on our real globe. For a start the rise and fall of the tide is measured by tide gauges, located chiefly at ports. Therefore we can over the years, from records at these ports, predict tides - we know also that the moon returns to a similar position, relative to the earth every 28 days, but the moon's orbit is elliptical and so it returns to exactly the same position only once in $18\frac{1}{2}$ years. This makes tidal prediction therefore a little harder.

The difference in level between high and low water is known as the amplitude. In the open ocean the difference between high and low water is only 2 to 3 ft., so that oceanic islands such as Tahiti and Hawaii experience a very small tidal range. Because the oceans do not cover the whole globe evenly but are broken up into many differently shaped basins of varying depth, the water in each ocean basin will surge back and forth in different ways in response to tidal pull.

Further complications are introduced by weather. Onshore winds build up tide levels, whereas offshore winds lower them, low barometric pressure increases amplitudes. "Storm surges" are produced when strong onshore winds accompany a rising tide. Finally there are local variations due to the size of the continental shelves and type of coastline.

We can regard the tides as waves that take 12 hours between crests. As the tides move across the basins on to the shallower shelves, they become more affected by the winds. The first new form is called an ocean swell; the distance between crests being about 500 ft. They move at about 35 mph. in the Pacific. When the swell approaches the shore it begins to feel the drag of the bottom. This slows the lower part of the swell and so the surface part moves more quickly and so the swell compresses and a wave is formed. Now the back of a wave travels faster than the front and so it rises to a peak and leans forward. Finally the wave leans too far forward and breaks. A wave generally breaks when the ratio of the wave height to wave depth is 3 to 4. Therefore a 6 ft. wave generally breaks in 8 ft. of water (Diagram E).

As a wave moves forward in deep water, we must remember that the water does not. The water just rises and falls in a circular fashion (Diagram F).

Finally let us consider some of the special types of waves and some of the effects tides and waves have on the land.

The most destructive of all waves is the TSUNAMI (Japanese for "harbour wave"). These are caused by undersea volcanic eruptions or earthquakes. Tsunami have been known to travel at speeds up to 500 mph.for distances equal to one third of the earth's circumference. Luckily the waves slow down (proportional to the square root of the depth) and strike coasts at a speed of about 25 mph. Even so, they increase in height, and so while at sea the waves may be 100 miles apart and 3 ft. high, near the coast they rise to 50 ft. When Krakatoa blew up in 1883, waves 135 ft. high reached Java killing 36,000 people. Today there is a great network of Tsunami warning devices around the Pacific.

Sometimes the tides are compressed into very narrow channels and when the natural rhythm of the water coincides with the incoming tides, large walls of water surge in. These are termed 'bores' - and the most impressive is in the Bay of Fundy where the tide is pushed forward by a 4 ft. wall of water to a final depth of 40 ft.

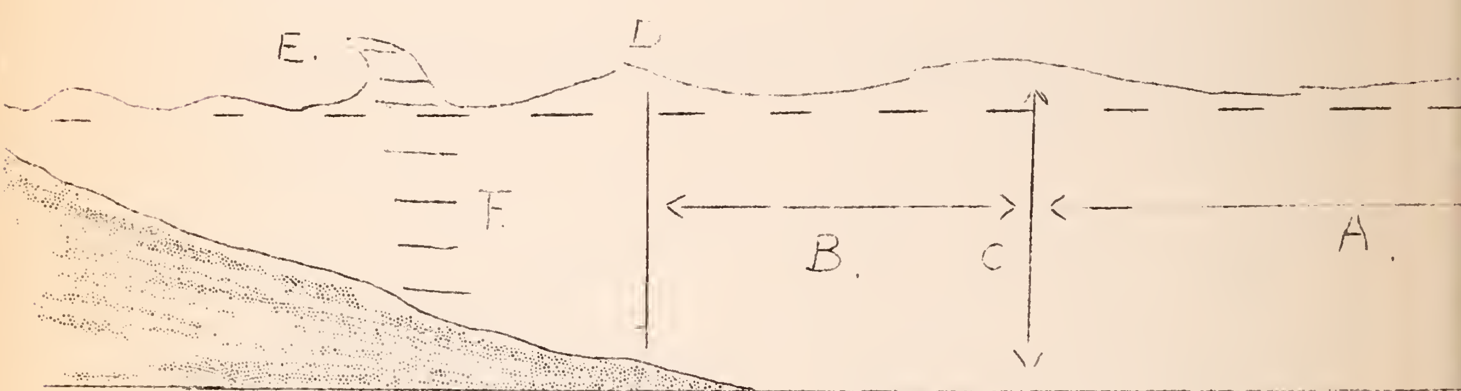
In general we can recognise two major types of shorelines - (1) shorelines of submergence and (2) shorelines of emergence. Submergent shorelines are often termed sunken coastlines. This type of coastline has many bays and inlets and offshore islands.

When the valley of a river is submerged it is termed a Ria shore and where a glacier has been submerged it is termed a FIORD coast.

When coastlines emerge we have lagoons, deltas, bars and sand done beaches. The greatest changer of coastlines is the sand carried by water. It acts as a continuous sandpaper - always smoothing, always cutting and always moving. It eats away the softer sandstones leaving the harder rocks as outcrops or stacks. When a current moves along a coast it spreads its load, making long beaches. The texture of the sand determines the kind of beach the sea will build. Coarse sand is like blotting paper; waves sink directly into it, depositing whatever sand they may be carrying. It piles up loosely and is constantly being moved around. Steep beaches result. Fine sand packs much tighter. Waves do not sink in; their action leaves a smooth, hard, gentle slope.

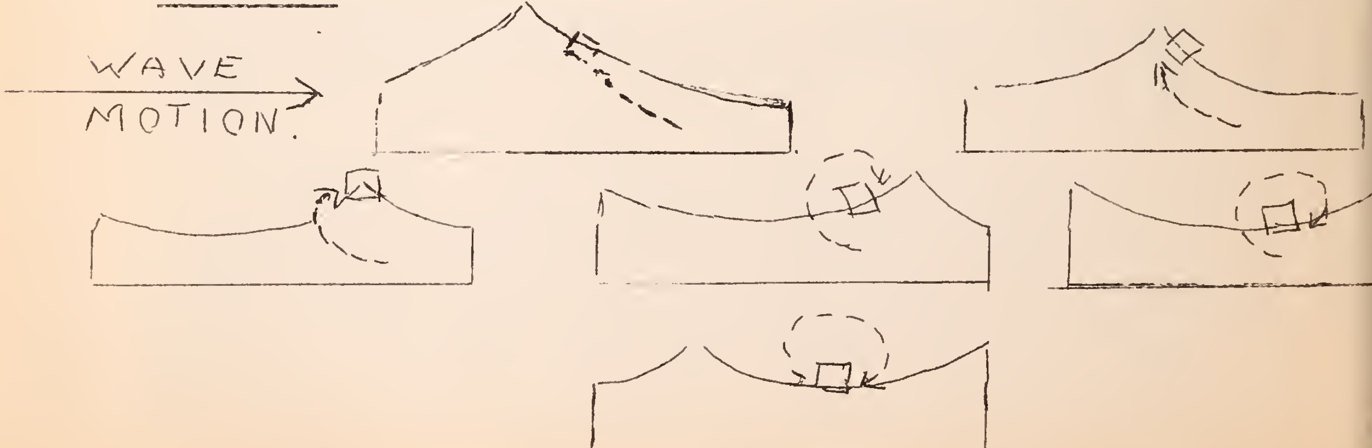
And so we have considered the effects of the largest piece of rock ever broken from the earth - the moon - to the smallest piece - a grain of sand. Both have a vital part in shaping the world we live in.

DIAGRAM 'D'



An Ocean Wave breaks when it enters shallow water. In the diagram the dotted line indicates the base of the waves. In deep water the height of ocean swell is twentieth of its length (A). In shallow water, the drag of the bottom shortens the wave length (B) to twice the depth of the water (C), and the wave is forced up into a peak (D). The peaked wave breaks when its height (E) is $\frac{3}{4}$ of the water depth .(F)

DIAGRAM 'E'



Cork float shows that waves travel, but that the water itself does not. In these drawings, the waves move from left to right, as the cork simply rotates in an imaginary circle, moving slightly up the front slope of the approaching wave. Then it slides to the right down the back. When the wave has passed the cork will not have moved more than an inch or two.

DIAGRAM "A"

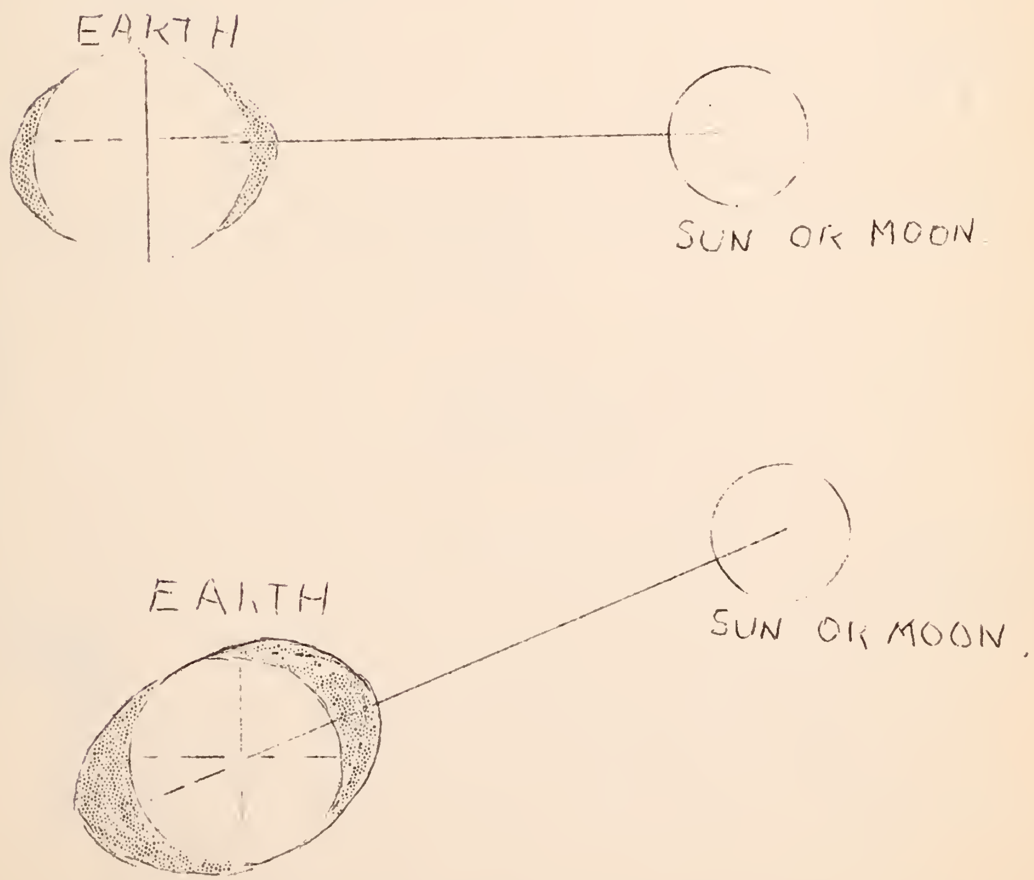


DIAGRAM "B".

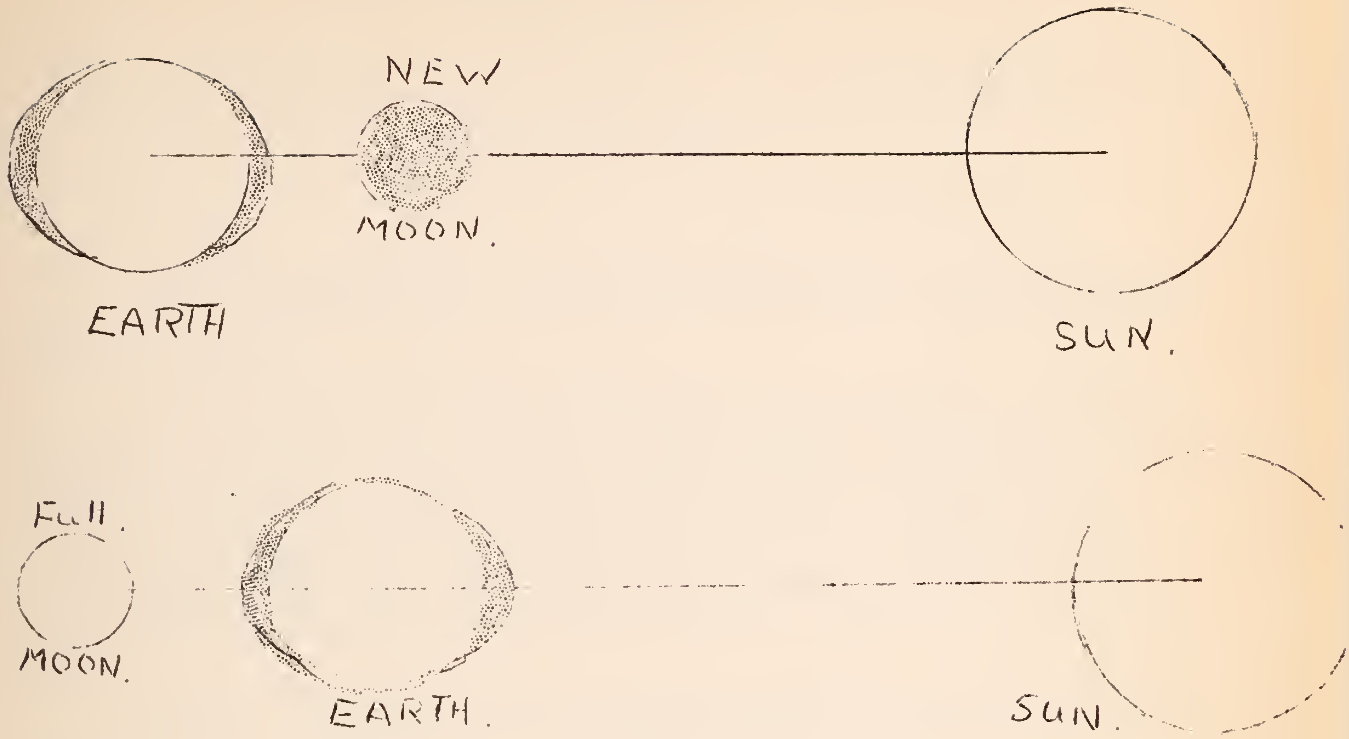
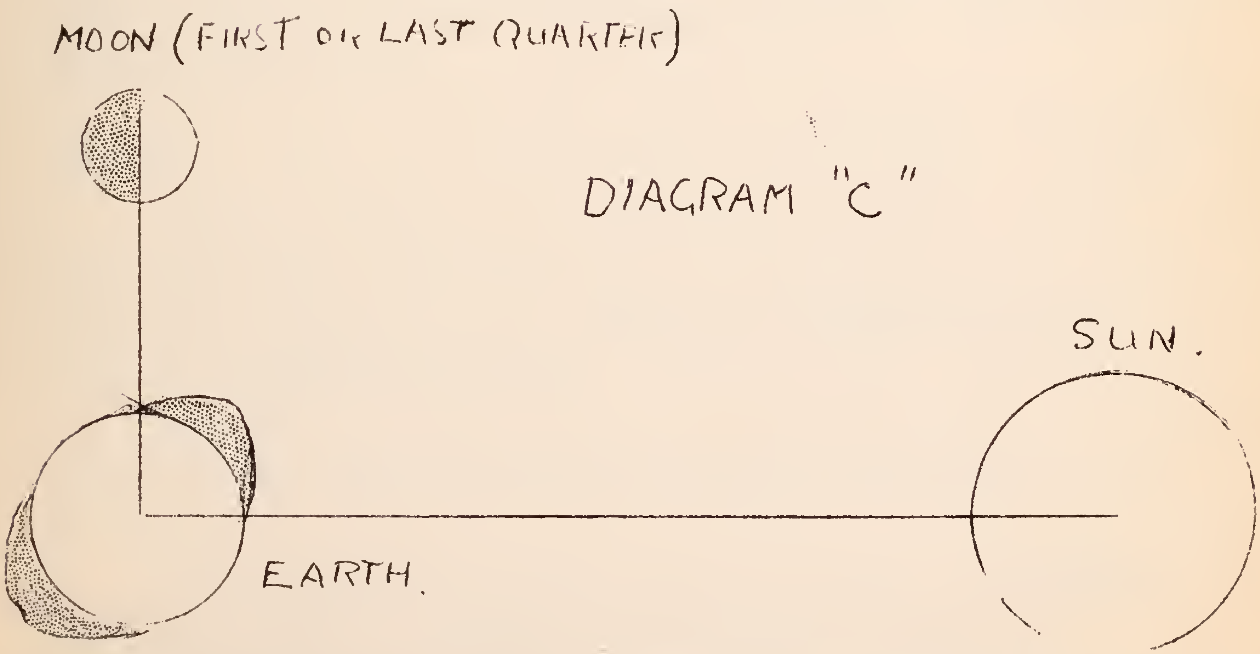


DIAGRAM "C"



Editors: N. & N. Gardner.

P O I R I E R I A.

Vol 3. Part 4/5. September/December 1966.

CLUB WEEKEND TRIP.

E. N. Gardner.

The Whangarei Heads weekend trip proved to be most enjoyable all round. The weather was fine most of the time and the collecting produced several treasures.

Saturday mid-day found twenty members of our Section arriving at the Baptist Camp at Taurikura near Whangarei Heads. Mrs.Worthy had come out from Whangarei and had a cup of tea nearly ready. Mr.Delph, our member who lives at Taurikura very ably helped us to get the water running in the cook house, but during our stay the reluctance of the water to run caused several willing hands to spend quite a bit of time going down to fill buckets in another building. However apart from this small snag everything was fine.

Low tide was at 3 p.m. and a most interesting afternoon was spent in exploring the nearby sand flat and rocky island reached by a short wade across in a couple of feet of water.

Whangarei Member, Dr.Bernard Bowden and son Thomas plus a young friend joined us for the afternoon and it was not long before Thomas called out that he had found a live Maurea tigris 'just perched on a rock waiting to be picked up.'

The next find of note was a large live Vicimitra - almost black with a white animal, and shortly after, a second one turned up nearby.

Murexsul octogonus with particularly long recurved anterior canals, were found living among small weed covered stones. Some of these shells almost looked as if they had been crossed with M. mariae. Chitons were plentiful and well coloured e.g. Eudoxochiton nobilis (very large), Cryptoconchus porosus, Notoplax violacea, Anthochiton aereus and Onithochiton neglectus.

The sand flat towards low tide was well populated with common shells and also a number of species not usually found so near the shore.

By sieving the coarse sandy mud live specimens of Scalpomactra scalpellum, Pupa kirki, Baryspira novaezelandiae, Dosinia maoriana, Maoritomella albula, Pervicacia tristis, Hunkydora australica novozelandica, Epitonium tenellum, E.jukesianum, E.philippinarum and Cirsotrema zelebori, were found.

At Mrs.Worthy's invitation everyone eagerly set forth after dinner for her Whangarei home, where a wonderful evening was spent in looking at some of her beautiful shell collections. A highlight, was the collection made on a trip to Queensland a couple of years ago. The full beauty of tropical shells was seen in the specimens which had been taken alive and therefore had lost none of their colour or sheen.

We were introduced to Mr. & Mrs.Hancock, members of Mrs.Worthy's Whangarei Shell Club, who had been out dredging and had brought in a number of live *Pupa kirki* for us. These delighted the Auckland Members as it is seldom that this species is found in good condition down this way.

After a very nice supper, Members thanked Mr. & Mrs. Worthy for a memorable evening and left for the Heads. Most of us had a bit of a wander round Whangarei before finding the way out on to the correct road but everyone duly arrived back and tumbled into bed about 12.30 a.m.

At 3 a.m. Mrs.Willan went out to see what shellfish might be about at low tide. The tide was so low that she was able to walk over to the island on bare sand and the light from the Marsden Point flare made the going quite easy. Unlike the tropics where night collecting is very good, our shells do not seem to come out any more than during the day.

Mr.Delph very kindly lent us a dinghy from which dredging could be done and full use was made of the opportunity.

Mr.Baker, Warren Judd, Mrs.Seager and Mrs.Otto went out dredging and Mr,Baker was pleased to obtain a *Vicimitra* in one haul

Dredgings were brought in and everyone invited to help themselves to the sand to be sorted later. Among the small shells found were :- *Phenatoma*, *Epitonium*, *Pervicacia*, *Nucula*, *Maoritomella*, *Balcis oxyacme*, *Crosseola errata*, *Acar sociella* and *Promerelina crasseoformis*.

The boys had set up their tank and soon had a number of interesting sea creatures to observe. The most unusual item was a very primitive and rare star fish *Luidia varia* which came up in their dredgings.

Sunday's weather did not look at all promising, with heavy clouds and odd showers round about, but after breakfast, a trip was made over to Ocean Beach to see if any shells had been washed up. Apart from masses of seaweed and a few *Spirula* the beach was swept clean.

Back at Urquarts Bay we had an early lunch and set off over the hills to Smugglers Bay. Mr. & Mrs.Hancock and two of their boys accompanied us.

Some very nice specimens of Atalacmea fragilis were found. These usually like the underside of smooth stones at about half tide. Other species living among the rugged rocks were large clean Lunella smaragda and Anisodiloma lugubris.

The wind was blowing in and the tide still quite well in, so after a look along the coast most of the party walked back to Urquarts Bay.

Those who went over to another bay and stayed until low tide found in interesting. Mrs.Kindleysides came back with a very fine specimen of Charonia capax.

Several members decided to return to the sandflat below the camp where it was quite sheltered and a most interesting time was had. Some spent a time sieving the coarse sand while others followed up trails and holes over the area. - It looked like a battle field after all the eager digging, but most of the shellfish were examined and returned to their holes.

The cause of the great activity was the finding of a live Offadesma angasi, by Mr.Hancock who had seen a couple of holes and dug carefully down to see what was there - maybe he dug carefully in case he got his hand nipped - it has happened before ! - but this time the care was rewarded in that a fine specimen of the rather uncommon Offadesma was found.

Taurikura mudflat proved to be the habitat of several usually uncommon bivalves as well as Struthiolaria papulosa in various stages of growth. Two largish holes about an inch apart were the indications of the presence of S.papulosa an inch or so below the surface. Now and again nothing seemed to be there but with careful digging well on either side of the holes to a depth of about 6 inches, live Offadesma angasi were found. About half a dozen were collected.

Offadesma occasionally washes ashore in numbers after gales but hungry seagulls quickly swoop on the fragile shells and shatter them to pieces. One has to be on the spot quickly to obtain any whole shells for the collection. Very seldom are they collected "in situ."

Among the molluscs living on the mudflat were Glycymeris modesta in large numbers, Struthiolaria papulosa and S.vermis, Baryspira australis and B.novaezelandiae, Venericardia purpurata, Philine angasi, Hunkydora, Pervicacia tristis, Dosinia maoriana and D.subrosea, and Diplodonta zelandica. One or two fine specimens of Penion adusta and Monoplex australasiae were seen in the area and one Longimactra elongata.

Everyone was packed up and away before dark and a good trip home was made. There was a lot of driving for those who took their cars and the passengers were most appreciative of being able to travel in such comfort for the weekend trip.

NOTES OF INTEREST.

An interesting record from material Mr.Douglas had at a recent meeting is Paratrophon exsculptus Powell, from Waikato Heads. This must surely be its most northerly record to date.

Mrs.Johnston showed us a series of very nice Baryspira novaezelandiae collected alive from an upper harbour mud bank, during the extremely low tides in September. Numbers of these molluscs were seen crawling out of the channel onto the mud at the turn of the tide. The shells were rather novel in that the colour bands were supressed or absent in some specimens. The white ones looked very much like the sub-species crystallina (Brookes)

On the mud and amongst the Zostera sea grass at the same locality were quite a number of Soletellina siliqua both alive and dead. These are not common as a rule in the Auckland Harbour though they are quite often found in the Manukau Harbour.

Richard Willan mentioned at our October meeting that in his salt water tank, a small pink crab associated with two specimens of Mactra ovata living in the tank, seemed to spend its time going in and out from one specimen to the other. "The shell seems to open to allow the crab to go out and then closes again".

Where do you look for small land snails? In the bush? Well, this does not always apply, especially with some of our introduced kinds, for recently numerous tiny, white, dead shells were noticed at the foot of a small clay bank in a farmer's pasture at Pukapuka. At this particular spot only short grass is present, and an examination of the base of grasses showed that quite a number of snails were living there. This is Vallonia excentrica, introduced from Europe - a small flat snail with a reflexed apertural lip.

Sacrilege!! From a correspondent in Gisborne who visited someone who likes to make rats and mice from shells.
"One very large perfect Penion dilatata has suffered the ignoble fate of becoming a rat and last night when I picked it up and said that I felt sorry to see it treated so, he produced something which, he thinks, will make a super rat, with a lovely long tail. Guess what it is? Believe it or not, it is a very lovely almost perfect Coluzea spiralis about six inches overall which came up in a trawl near a reef twenty miles off East Cape - and he will not part with it, not for anything!"

Laurie Price who is again collecting material for Dr.Solen of Chicago Museum, writes from Tasmania :-

- "Up on the higher slopes of the mountains are extensive forests of beech - like our South Island - though there always are a certain proportion of Eucalyptus too, right to the tops of the mountains 4-5000' up in the snow! As far as I can make out, there are only two species of beech - the myrtle beech and the peculiar deciduous beech - have never seen a decidious beech before - quite a primitive species I believe. Also, high up, there is something that looks like our Dracophyllum (Nie-Nie) - probably related, but it grows on one tall stem, not branched like ours.

Well the land snail collecting is going very successfully so far - getting a fair number of species - must have about 30 or so, to date and also, what is more important, an extensive series of live specimens of most. The Endodontids over here are super - many very large species, for which I am very thankful, seeing that the gloom is like Darkest Africa in the bush most days !!

Caryodes is apparently very widespread - have found it over half the island so far - and it shows considerable variation in size and to a lesser extent, colour - ranging from monsters of two inches to midgets of three quarters of an inch.

I got a fine series of the Tasmanian Bryon last week up the N.E. Coast - crawling round in droves on trees, rocks and on the ground after overnight rain on the Freycinet Peninsular. A very interesting area here. Freycinet Peninsular consists of a range of spectacular red, white and black granite mountains with a sparse covering of small trees and shrubs and a magnificent range of wild flowers in rainbow colours. Quite a variety of snails too - a lovely place for a camping, tramping holiday. The only snag when I was there (naturally) was the foul weather - rain, howling gale and freezing cold - the worst I've had over here so far !! "

VICIMITRA MAORIA FINLAY

This was listed by Suter as Mitra carbonaria Swainson who states, "-- only worn and empty shells have hitherto been found. Type is from Port Jackson. "

Suters' Bay of Islands record of size is 48 mm. x 15 mm. Even at the time Finlay created a new species for the N.Z. Shell in 1927 (T. N.Z. I. Vol 57 p.409) only very worn specimens were available.

It is listed in Bucknill's "Sea Shells of New Zealand" as M.carbonaria. He states that'carbonaria' refers to its black colour. Most earlier specimens appear to have been secured from Waihau Bay, near East Cape, Leigh, Manganui Heads, Whangarei Heads, Tauranga Bay, Cape Maria and Ahipara. Trawled specimens are also known.

The two shells picked up at Taurikura Bay were six feet apart in two feet of water at low tide. The animals appeared to be feeding as the shells were both three quarters buried in the sand with just part of the spire protruding at an angle into the water - Colour almost black with a white animal. Maximum size in our collection $2\frac{3}{4}$".

N. Gardner.

---oOo---

METROPOLITAN LAND SNAIL COLLECTING.

One would scarcely expect to be able to indulge in land snail collecting within a very short distance of Auckland's busy Queen St; however, this can be done in Grafton Gully, just below the massive concrete bridge tower on the Symonds St., bank.

Here, a tiny area of mature vegetation is undisturbed, though invaded to some extent by exotics such as Oak, Pinus and wandering jew. Much of the opposite bank has recently been cleared for motorway construction and even this tiny area is very close to the road machines.

In leaf mould and under rocks beneath punga tree ferns and Kawakawa a notable small land snail colony exists. Some species occur quite plentifully.

The following 16 species, collected on a recent hunt are :-

Operculates :- Liarea egea (Gray); Cytora hedleyi (Suter); Cytora torquilla (Suter).

Flammulinidae was represented by :-

Thalassohelix ziczag (Gould); Therasiella tamora (Hutton); Suteria ide (Gray); Flammulina costulata (Suter)

Charopid members were :-

Ptychodon pseudoleioda (Suter); Egestula egesta (Gray); Subfectola caputspinulae (Reeve); Mocella cogitata Iredale.

Other species were :-

Phrixgnathus erigone (Gray); Tornatellinops novoseelandica (Pfeiffer); Delos coresia (Gray); Delos jeffreysiana (Pfeiffer).

The specimens of Delos coresia were of particular interest because of their unusual colour - pale translucent green with no sign of colour pattern. Egestula egesta is not as a rule very plentiful but, strangely enough it seems to like living under stones and rocks covered with wandering jew, both here and in certain areas similarly weed covered at the base of Mt.Eden.

---oOo---

HIGH TIDAL MOLLUSCS OF RANGITOTO ISLAND.

N.Gardner.

The Molluscs living at high tide level are of particular interest for they are plentiful in numbers and also well represented in species; factors which make observation easier than in localities where the fauna is sparse.

Rugged lava outcrops at high tide level seem to catch a considerable amount of spent vegetation and seaweed etc. which no doubt provides the feeding needs of many small molluscs as well as encouraging the growth of algae.

The shallow depressions in the lava flows at high tide level are filled with mud, and where loose blocks of rock rest on this, an interesting community can be observed. This is in the "Salicornia" zone, just before it gives way to tussock (Stipa) at the maximum high tide level. In crevices under these rocks and in the mud beneath, five minute species of shells exist or rather thrive, even though one could hardly consider it the choicest of habitats.

The species are :-

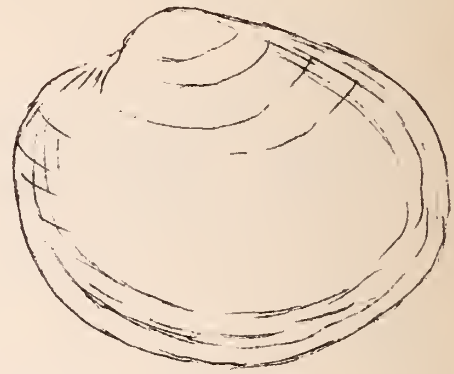
Assiminea vulgaris (Webster) Fig.1.
Suterilla neozelanica (Murdoch) Fig.2.
Leuconopsis obsoleta Hutton Fig.3.
Rangitotoa insularis Powell Fig.4.
Lasaea maoria Powell Fig.5.

The two taenioglossids Assiminea and Suterilla live in decaying algae, while Leuconopsis and Rangitotoa are considered to be organic mud feeders and no doubt Lassea obtains its nourishment from this source also. Rangitotoa occurs quite abundantly on Rangitoto Island, but is rarely seen elsewhere. It has been reported from the Kaipara and Manukau Harbours.

Anyone wishing further information on this subject are referred to Dr.Powell's paper in Vol 63 of the T.N.Z.I. 1933 entitled "The High Tidal Mollusca of Rangitoto Island, Auckland, with description of a New Genus and two New Species".

4.

Rangitotoa insularis.
3.7 mm x 1.9 mm.



5.

Lasaea maoria.
2.4 mm x 1.95mm.

2.

Suterilla neozelanica.
2.3 mm x 2.75 mm.

3.

Leuconopsis obsoleta.
1.75 mm x 3.1 mm.

1.

Assiminea vulgaris.
2.0 mm x 1.4mm.

COLLECTING PARYPHANTA IN WEST NELSON.

The lignarias and rossianas.

B. Elliott.

January 8th, 1966, the day that Sharon Miller and I left for two weeks in the Karamea district, was hot and sunny. After a wet and rather cold summer the fine weather seemed to be a good omen for our holiday, during which we hoped to add many specimens to our Paryphanta collections, as well as to our collections of rocks and minerals. We spent the first night at White Cliffs, beside the Buller River. After tea we went for a walk down the river to search for rock specimens. We did not expect to find any shells here, but a search along the high tide mark left by the last flood yielded several Potamopyrgus antipodum, Planorbis corinna, a small Pisidium novaezelandiae and a few small land snails.

Next morning our lovely fine weather had deserted us. By the time we had finished breakfast and packed everything in the van ready to leave, a light drizzle was falling. Very soon it was pouring, and it continued to rain all the way to the Mokihinui River where we made our first stop. We went out to the beach at Waimarie, a wet walk but a profitable one, from a rock collector's point of view. The shelling however, was typical of the wild West Coast; just a few broken pieces - certainly nothing worth picking up. Half a mile inland from the turn-off to Waimarie we stopped for Paryphanta lignaria x unicolorata hybrids, which according to our map were to be found in the narrow strip of bush between the road and the river. After half an hour of fruitless searching we drove back almost to the turn-off, and I had taken only a few steps into the bush when I found my first snail. By this time the rain had stopped and the sun was shining, so we could really enjoy our Paryphanta hunt. Live snails were plentiful, up to 2 inches in size, but mainly smaller. Some of these hybrids are as one-coloured as unicolorata itself. Full of enthusiasm we drove on to our next stop, just over the Mokihinui Bridge. A short way up the hill on the left of the bridge we found Paryphanta lignaria/lignaria. Soon we each had several complete shells, so we decided to move on and try our luck with Paryphanta l. johnstoni and unicolorata. We drove back across the bridge, and then over the hill into Seddonville. As the maps I had of this area were not very detailed, we called into a house and asked the lady there if the nearby creek was Chasm Creek. "I've only been here ten years" she told us, "so I don't know the names of the creeks yet. "The man next-door would know" she said. He, however, was not at home, so we tried another lady. "Snails," she cried, "there's plenty of snails here!" And out into the garden she went to get some for us. In vain we explained that we did not want garden snails, and showed her the illustrations in "Shells of New Zealand". Fortunately Helix aspersa seemed to be absent that day. The lady told us that Chasm Creek was the one we'd crossed before we got to Seddonville, so back we went to the bottom of the hill. "Let's try here for unicolorata" I said, and peered into the bush. And there was a broken unicolorata! But finding my first one so quickly did not mean that they were plentiful. Even pieces were hard to find. But after half an hour of almost fruitless hunting, I suddenly found four lives, 2 adults and 2 juveniles, but I did not take the juveniles. Then we drove to the top of the hill, where, we'd been told, Paryphanta lignaria johnstoni was to be found in the water-drain and in the bush. Sure enough, there were several small complete johnstoni in the water-drain. Getting to the bush was not so easy. Though it was a very short distance away, there was a belt of dense, high bracken to get through first. I got down on hands and knees and pushed a tunnel through the bracken. It was hard work, but worth it, for when I reached the bush I found five live johnstoni in a very short time - 2 adults and 3 half grown shells - maximum size: $1\frac{5}{8}$ inches. The two adults, though found within a few feet of each other, are quite different. One is true johnstoni, with many red lines above and below; the other is almost unicolorata, with only the faintest of red lines. The half grown ones vary somewhat, but are all closer to johnstoni than unicolorata. It was now late in the afternoon, and time to go, as we wanted to reach Mr.Harvey's farm, between Little Wanganui and Karamea, that evening. The weather had been kind to us after all, but just as we started over the Karamea Bluffs it started to pour again. After all I had heard about the terrible road over the Bluffs, I was relieved to find it in very good order; certainly nothing to bother the average driver. We arrived at the Harvey's place just before dark, and were given a typical West Coast welcome, and made to feel at home immediately. After tea we looked at Mrs.Harvey's Paryphanta collection, and then began the long job of cleaning the snails we'd gathered that day.

It is amazing what can be found inside empty Paryphanta shells. I always take every Paryphanta I find, no matter how poor. I wash all the snails carefully, breaking open those that are too poor to be of any use to a collector. I pour the dirty water through a fine sieve to catch the dirt, then spread the dirt out on a sheet of newspaper and leave it for two or three days to dry thoroughly. Then I put it through four sieves of various sizes, and carefully sort through it, usually with very worthwhile results. Inside the hybrids were Fectola rosevearei and Phrixgnathus marginata. Inside P.lignaria lignaria: Gerontia pantherina, Phenacohelix stokesi, Allodiscus granum, Phrixgnathus regularis, Phrix. marginata, Potamopyrgus antipodum, Cytora lignaria, Fectola reeftonensis, F.mutabilis and F.buccinella. Inside P.l. unicolorata and johnstoni: Phelussa hypopolia, Phenacohelix sokesi, Phrixgnathus regularis, Phrix.phrynia, Fectola mutabilis, F.buccinella and F.rosevearei. I was surprised to find Potamopyrgus inside the Paryphantas, and was even more surprised when Sharon found a small bivalve - probably Sphaerium novaezelandiae - among her "dirt". I wonder how these little freshwater shells get inside land snails?!

The following morning Mrs.Harvey, Sharon and I set off for Oparara and Paryphanta lignaria annectens. We drove along the narrow road past the limeworks, and I soon realised that I should have left the van by the limeworks! There was no hope of turning around; we just had to keep going and hope we did not get stuck in the mud. At the end of the road we collected samples of beautiful pink granite before setting off along the track to look for snails. Soon we found our first pieces of annectens. We followed the track to where there was a huge slip and a notice warning that it might not be safe to cross it. All the way along the track were pieces of annectens, and up in the bush we found more pieces. The rats and wekas had certainly been busy! We did not find any complete shells, although a few were not too badly damaged. In the afternoon Mr. and Mrs. Harvey took us to the mouth of Glasseye Creek to hunt for Paryphanta lignaria lusca. Mr.Harvey told us they were easy to find here - "You can fill a sugar-bag with them," he said. He was a little too optimistic however, for lusca proved to be quite hard to find. We each found several dead shells, but only three lives among the four of us. Most of them were rather small, the largest being $1\frac{7}{8}$ inches. That evening we visited Mr. and Mrs.Johnson at Little Wanganui, and looked at their collection of snails, and made plans for the following day.

Early next morning Mr.Harvey, Mr. and Mrs.Johnson, Sharon and I were on our way to the Charming Creek Coalmine, about three miles south of Seddonville. Dead snails were plentiful here, in fairly good condition; maximum size $2\frac{1}{4}$ inches. I found only one live snail, though my companions were luckier. At the time I thought we were collecting Paryphanta lignaria rotella, especially as most of the snails had only the faintest of spiral lines underneath. However, a few of them had the numerous red lines of johnstoni, which caused me to wonder, and later that day I happened to be reading an article in "Poirieria" which confirmed that they were indeed johnstoni. After lunch we all went to Coal Creek, just past Seddonville, to look for Paryphanta lignaria unicolorata. After a long and fruitless search away up the creek, Mr.Johnson discovered unicolorata living right beside the road on the far side of the creek. It was now time to go, and there wasn't time for a thorough search. But just as we were leaving I found four beautiful live adult snails (maximum size 2 inches) all together in the leaf mould. Mr.Johnson, having found the spot before us, had got a lovely lot of snails, both alive and dead. Inside unicolorata I found the following small snails : Fectola otagoensis, F.rosevearei, Phrixgnathus viridula, Phrix. regularis and Rhytida patula. Inside P. johnstoni: Gerontia pantherina, Phelussa hypopolia, Phrixgnathus marginata, Phrix. phrynia, Phrix. regularis, Fectola buccinella, F. mutabilis, Cytora pannosum and Potamopyrgus antipodum zelandiae.

Next morning, January 12th, Sharon and I left the Harvey's place for a couple of days collecting around Seddonville. We stopped for a brief look on Little Wanganui Beach; such a lovely sandy beach, but with absolutely nothing to offer the shell collector. On an old tree trunk at low tide Benhamina obliquata, Notoacmea parviconoidea, Modiolus neozelanicus and Melarapha cincta were living. At high tide I picked up one Paratrophon patens and some nice examples of Mussel's Beard, Sertularia bispinosa. I was interested to see dozens of tiny juvenile Perna, 2 - 3 mm. in size, living on the Mussel's Beard.

Realising that the bush was going to be more profitable than the beach, we were soon on our way. We stopped up on the Bluffs at Glasseye Creek, to look for *Paryphanta lignaria lusca*. We walked up the creek a short distance, crossed a little stream and went up into the bush on the left of Glasseye Creek. Half an hour and two broken snails later we decided that this was no good, and crossed to the right side of Glasseye. Here *lusca* was quite abundant, only one live specimen but numerous good dead ones, larger on average than those at the mouth of Glasseye; maximum size 2¼ inches. Having got a good haul of *lusca*, we drove on to Seddonville, where we made enquiries about the State Mine Ridge and *Paryphanta lignaria rotella*. One man told us there was a good track up the Ridge, so following his directions, off we went. The "good" track turned out to be an extremely overgrown track, and in places no track at all. After a couple of hours pushing our way through dense bracken we arrived at the old State Mine, where we stopped for a rest. A short way further the "track" became a wild tangle of supplejack. It was obviously going to be quite impossible to reach the top of the Ridge, so regretfully we turned back, without having seen even a piece of a *rotella*. We then went back along to Coal Creek, and after a brief hunt for more *unicolorata* we walked a mile or two further along the road to search for *Paryphanta lignaria unicolorata x ruforadiata* hybrids. These were to be found on both sides of the road in wet swampy bush. But the rats and wekas had been very busy, and though Sharon found one live, I found only damaged shells and pieces, and even these were hard to find. We camped that night at the Mokihinui Bridge.

Next morning we went back to Seddonville to make more enquiries about the State Mine Ridge. The man who'd told us about the "good track" admitted that he hadn't been up there since before the war. Guess things had changed a bit during that time! He sent us along to his father, who was a keen tramper. This old gentleman told us that there was a very good track up the Ridge, and pointed out where to go. "You can't miss it", he told us several times. Sharon and I very soon proved that we *could* miss it! After an even harder scramble through dense fern than on the previous day, we reached a clearing halfway up the Ridge, where we stopped for lunch. By this time we were both very disgruntled, and sure we were wasting our time. But we had hardly started off again when I found a small *rotella*, and a little further on there was an excellent track through the bush, just as the old gentleman had said. By the time we had reached the top of the 800ft. Ridge, we had each found one good dead snail, but they were so hard to find that we decided to cross an area of fairly open country to another patch of bush not far away. Here *rotella* was plentiful, and in a very short time we had each collected over a dozen empty shells, up to 2 inches in size, but mainly much smaller. Only one live was seen, a juvenile which we left behind. We spent about half an hour there, and then, as it had taken us four hours to get there, we decided it was time to go. Going back we found the track we'd missed on the way up, and as we did not have to push our way through the fern, we made the return journey in just under an hour. How I wished we'd spent a couple more hours among the rotellas! We called on the old gentleman again and told him we'd found the snails and the track. "But we missed the track on the way up", I said. He looked quite startled. "But you can't miss it!" he said. I enquired about the possibility of going up the North Branch of the Mokihinui River after Paryphanta lignaria ruforadiata, but he told us a boat was needed for that trip, so we decided against it. He told us there were snails in the Paparoa Range between Westport and Greymouth (presumably Paryphanta rossiana gagei) but when I brought out my maps and asked him to point out just where, he didn't seem to know. I was able to find out only one sure fact - "You can't miss them." I bet I could!!

As there was a little of the afternoon left, we went to look for Paryphanta lignaria unicolorata x rotella hybrids near Seddonville. We found a few pieces, but instead of stopping at the first patch of bush we followed an old track which soon became non-existant. By the time we'd retraced our steps it was too late for any more Paryphanta hunting that day. We drove back to the Harvey's farm that evening. Next morning was spent washing and cleaning our snails. Inside P. lignaria lusca were: Thalassohelix obnubila, Charopa coma, Fectola rosevearei, F. mutabilis, Phrixgnathus liratula, Phrix.marginata, Cytora chiltoni and Potamopyrgus antipodum. Inside P.lignaria rotella were: Phenacohelix stokesi, Phrixgnathus liratula, Phrix. regularis, Cytora pannosum, Rhytida patula and a Rhytida egg.

In the afternoon Sharon and I once again set off for Oparara. We wanted to explore the caves there, as well as collect some more (and better) Paryphanta lignaria annectens. With our hearts in our mouths we crossed the big slip, and then followed the track for several miles. Annectens was common all the way along the track, but oh, what a feast the rats and wekas had had!! Not one perfect shell was to be found, although a few were in quite good condition. Only one live snail was found, and even that was marred by a small hole and rat teeth-marks. It was only a half-grown specimen, but its chances of survival seemed so slim that I decided I might as well keep it. The largest annectens I found were $2\frac{3}{8}$ inches, but specimens from the Gunner Downs grow larger than this - to about 3 inches. After $2\frac{1}{2}$ hour's walking we turned back, as we had no idea how much further the caves might be; perhaps we had already passed them. I believe that a lot of work has been done on the track since we were there, and it is now easy to find the way to the caves. Back we went, our socks and slacks liberally coated with "Fish Hooks" (Uncinia). We were very surprised to find a silver-eye held prisoner by the Fish-hooks and quite unable to get free. I had not realised they were powerful enough to hold a bird. We released him, and he flew off unharmed. I stayed up late that night washing my haul of annectens. My impressive-looking bag of snails looked a lot less impressive by the time I'd thrown out all the badly damaged shells! Inside them I found: Rhytida meesoni perampla, Geminoropa oconnori, Allodiscus granum, Thalassohelix obnubila, Phenacohelix stokesi, Phrixgnathus regularis, Phrix. phrynia, Phrix.marginata, Cytora lignaria, Cytora chiltoni, Potamopyrgus antipodum, P.spelaeus, Fectola mutabilis, F.buccinella, F.otagoensis and Flammulina zebra.

Next morning, January 15th, we reluctantly said good-bye to the Harveys and once again headed south. We stopped at the Mokihinui Bridge for more Paryphanta lignaria lignaria. This time we walked about $\frac{1}{4}$ mile along the side road before climbing the hill, and here we found lignaria very plentiful, beautiful specimens both alive and dead, up to two inches in size. On the way back to Seddonville we stopped at Chasm Creek. I was curious to find out if the creek formed an effective barrier between unicolorata and johnstoni, so I scrambled up into the bush on the east side of the creek while Sharon searched on the west side. About 20 minutes later I had found one unicolorata, and Sharon had found three pieces of unicolorata. Unfortunately time did not permit us to look further into this. I think that there is no natural barrier between unicolorata and johnstoni, and that the two subspecies hybridize, as one of the johnstoni I had found a week before was almost certainly a hybrid. We drove on to Seddonville and spent about an hour hunting for unicolorata x rotella hybrids. The wekas had been busy here too, and all the snails we found were damaged. Our next stop was about two miles north of Ngakawau, for a quick look on the beach. As usual, sea shells were absent, but I collected a number of Potamopyrgus antipodum zelandiae in a small stream. Sharon found a Paryphanta lignaria johnstoni on the beach - no doubt it had washed down from nearby Radcliffe Ridge, as it had a much denser pattern of red lines than the Seddonville or Charming Creek snails. But there was no time to go exploring up the Ridge if we wanted to reach Denniston before dark. We had been told such dreadful things about the road up to Denniston that I was very nervous at the thought of driving up there, but I did not want to miss out on Paryphanta rossiana patrickensis. To my surprise the road turned out to be tar-sealed nearly all the way, and not at all dangerous providing one drove slowly and carefully. Halfway up we ran into fog, and by the time we reached Denniston, at over 2,000 ft., the fog was so thick that we could only see a few yards in front of us. There we were, two strangers in a lonely little township away up in the mountains, with darkness closing in and the fog getting thicker and thicker. Fortunately we both saw the funny side of the situation, and felt much better after a good laugh. As neither of us had a clue where to go, I called into a nearby house and asked if there was a camping ground at Denniston. There wasn't, but with typical West Coast hospitality these kind folk let us park the van on their lawn and invited us inside. When I said that we were snail collectors I was amazed when Mr.B. not only knew what I was talking about, but exactly where to find them, and he said that he would take us there the following day. I could hardly sleep for excitement that night. Next morning Mr.B. took us to a spot several miles inland and to the north of Denniston; this would be the middle one of the three P.rossiana patrickensis localities shown on the map in "Shells of New Zealand". We crossed a small stream, and to my surprise I found my first patrickensis (badly damaged) not a chain from the road. After a long search had revealed only a few odd pieces, Mr.B. went off home, leaving us to carry on hunting alone. We tried the other side of the road with no success and then went back to where we'd started. And there, in a patch of manuka, we found them - dozens of them! Unfortunately, however, our "friends" the wekas had found them before us, and had made a very thorough job of them! Within a couple of hours we had each found about 100 snails, which included four undamaged ones - two each. Almost every one had been pecked through the top and in through the side, making them practically useless for a collection. Most of them were adults, just under $1\frac{1}{2}$ inches, with the largest just over $1\frac{1}{2}$ inches. They were nearly all in very fresh condition, but a thorough search failed to produce even one live specimen. We tried several other nearby areas without success. Quite suddenly the fog came down, and by the time we had driven back to Denniston it was almost as thick as it had been the previous evening. We said good-bye to our kind friends, and set off for Westport where we stopped to buy food and petrol. Then we headed south to Woodpecker Bay where we spent the night. The tide was high, so there were no shells to be found, but there were a number of very nice Elephant Fish Egg Cases washed ashore, and Potamopyrgus antipodum zelandiae in a nearby stream. My patrickensis did not yield many small snails : Rhytida meesoni perampla, Phelussa hypopolia, Phenacohelix stokesi, and Phrixgnathus phrynia.

Next morning, January 17th, found us heading south again - first stop Punakaiki, where we explored the wonderful pancake rock formations. At Greymouth we stopped to enquire how to get to Rewanui and Paryphanta rossiana gagei. We were told that there was no road and we would have to go by train; however, a road was under construction and would be finished in about two years. As the mountains were covered with dense fog, we decided to leave gagei until the return journey, and keep heading south to Mt.Tuhua and Paryphanta rossiana fletcheri. We reached Lake Kaniere late that afternoon, and made enquiries about the track up 3,600 ft. Mt.Tuhua. The store-keeper said he would take us up Mt.Tuhua the following day. But this time our luck was out, for at 4.30 a.m. it was raining steadily. By 8 o'clock it was pouring, and by the time we'd had breakfast we were both damp and miserable, so we drove to nearby Kowhitirangi where I used to live. We were welcomed by my ex-next-dor neighbours, and a cup of tea and a warm fire soon made us feel much more cheerful. But the rain continued all that day and the next. The following morning, January 20th, was our last chance, as we had to head northwards that evening. The weather had improved a lot, but there were still occasional light showers, and quite a bit of mist around the mountains. No doubt conditions would not have been any better at Ross, 16 miles to the south, so we decided it was not worth the risk, and reluctantly said good-bye to our chances of collecting Paryphanta rossiana rossiana and P.rossiana fletcheri. We spent the day at Hokitika, where we visited the beach (nothing!) the Greenstone factory, the Museum, and an elderly gentleman who makes wonderful ornaments and jewellery from polished greenstone and silver-pine. Later that afternoon we set off northwards. Rewanui was still blanketed in dense fog; it was obvious we would not have a chance of finding Paryphanta rossiana gagei. We stopped at 12 mile, north of Greymouth, where I collected a few Patelloida corticata, P.c. pseudocorticata and some chitons, before the sand-flies became unbearable. We spent the night at Woodpecker Bay.

Next morning, after collecting a few nice rocks in the nearby Fox River, we set off for Westport. As we had a few hours to spare we decided on a quick trip back to Radcliffe Ridge, where Sharon had found one Paryphanta lignaria johnstoni on the beach, two miles north of Ngakawau. We climbed a steep ridge on the right side of the stream, and entered the bush at 700 ft., and found ourselves among a wild tangle of supplejack and low-growing Cordyline. As it was obviously going to be a dreadful struggle to get to the top of the Ridge (about 1,300 ft.), we reluctantly turned back. Had I known I was in the right place I'd have considered it worthwhile forcing my way through, but one dead snail on the beach, and a dot on the map in "Shells of New Zealand" did not prove that we had picked the right spot. Back at Westport we tried several of the local beaches, but in spite of a low tide we found nothing. We spent a pleasant evening looking at Mr.Harry Johnston's collection of snails, which is in the care of his niece, Mrs.Bailie.

Early next morning we were on our way home. I stopped at Rocklands in the Buller Gorge to enquire about Paryphantas. Somewhere between there and Denniston, I'd been told, there were large snails about three inches across. I did not take much notice the first time I was told about them, but when a second person mentioned them I certainly did take notice. They would be too big for rossianas, and as far as I know the lignarias do not extend this far south. The lady at Rocklands knew nothing about them, but sent me along to a neighbour. He also could not give me any information, except that his father knew about these snails - but his father was in Invercargill, so that was the end of my enquiries. The identity of these big snails remains a mystery, perhaps to be solved on a future trip.

The writer wishes to thank Mr.N.Gardner for identifying the smaller snails. His help is very much appreciated.

---oOo---

OBITUARY - JOYCE ALLAN, F.R.Z.S.

Miss Allen passed away on September 1st. after a long illness.

She joined the staff of the Australian Museum in 1917 as assistant to Charles Hedley and subsequently to Tom Iredale.

From 1944 until 1956 she held the position of Curator of Molluscs.

The study of Opisthobranchs was her speciality. In this field her watercolour illustrations were particularly fine. Probably her best known works in this country are the large and comprehensive volume entitled "Australian Shells" and "Cowry Shells of World Seas", both of which we have recourse to refer to so often.

---oOo---

Most Conchologists know of that excellent publication called the "Nautilus" but few no doubt know of a second one of this name which originates in Switzerland. This periodical of long format, and resembling a newspaper, advertises Pharmarceutical Products, but interspaced are some beautiful colour Plates of marine life with a considerable text on various subjects.

The issue before us contains:-

"Ovum size and postembryonic phase of Cephalopods"
Dr.K.Mangold - Wirz.

"Marine animals or plants?" Prof.E.Tortonese. dealing with
Mediterranean Corals.

"Marine Vegetation of West Antarctica", Dr.M. Zimmerman and
Dr.I.Lamb.

"International Co-operation in the Indian Ocean", Dr.A.T.Pruter
and Dr.R.Shomura.

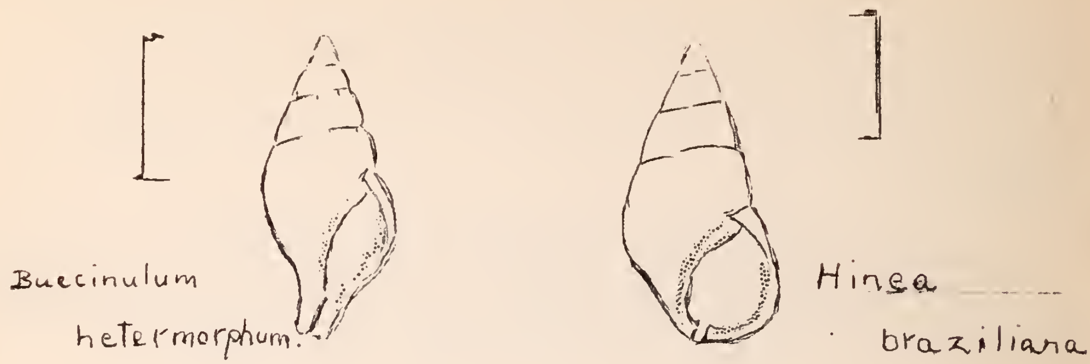
---oOo---

A small gasteropod, very rare from the New Zealand shoreline - in fact, one which does not seem to have been taken for many years, is Hinea brazialiana.

It was originally recorded by Suter from the Bay of Islands, and two others are listed by Dr.Powell in Molluscan Systematics No.1.

Members should watch out for this on their beach excursions - particularly those in the North Auckland area.

Somewhat resembling a small white Buccinulum, the shell could in fact, if not examined closely, be passed over as a white Buccinulum heteromorphum. A different apertural shape is quite discernable and the shell also has a distinct brown epidermis. The following figure illustrates its shape :-



It is a very common shell at Norfolk Island but a decided rarity here.

---oOo---

The smallest, and probably rarest member of Mytilidae in New Zealand is Septifer c.f. bilocularis.

Only a few specimens have been recorded from our waters - from deep water in the Bay of Plenty and off the Northland Coast. These are associated with the species bilocularis which is found commonly at Norfolk Island, but are of very small size - only 3 or 4 mm. Normal size is about half an inch.

Of much the same shape as our large brown Modiolus areolatus, this miniature is strongly radially ribbed and the margins are strongly crenulated. The colour is distinctive - verdigris green with blotches of red or brown.

Shell sand secured recently for Mr. Penniket by Skin divers off Poor Knights Island, has yielded several examples of Septifer, so it seems as if it may occur not uncommonly here.

---oOo---

NOT ALWAYS BEER IS FOUND IN A BEER BOTTLE.

Yo, heave ho - and a bottle of Shells ! Some time ago I had the luck of a Chinaman when I was given a beer bottle one third full of shell sand, that had been trawled off Mayor Island in 40 fathoms.

On looking down the spout I could see a number of the more common deep water varieties of shells which had come to the top so thought the rest would pay investigation.

After careful sieving and sorting the results were as follows :-

Bathyarca cymbaea	7 half valves.
Myadora novaezelandiae	2 half valves.
Tahunanuia alata	half.
Pleuromeris sp.	1 and 9 halves.
Cuna carditelloides	2 and 1 half.
Cuna mayi	4 and 5 halves.
Nemocardium pulchellum	4 and some halves.
Notocorbula zelandica	half only
Cosa costata	half only
Nucula nitidula	2 halves.
Nuculana bellula	2 halves.
Notocallista multistriata	2 and several halves.
Cuspidaria trailli	half only
Venericardia purpurata	about 2 dozen valves.
Cirsotrema forresti	1 slightly broken.
Xenophora neozelanica	1 very small.
Tanea zelandica	4 small.
Uberella barrierensis	1.
Poirieria zelandica	4 small.
Zeatrophon caudatinus	1.
Zemitrella sp.	1.
Pallium convexum	2 small halves.
Chlamys g.gemmulata	1.
Powellisetia sp.(Notosetia)	3.
Zeradina odhneri	2.
Badenia semireticulata	8.
Schizotrochus mantelli	6.
Austrofusus glans	Several.
Macrozafra sp.	1.
Nassarius aoteanus	Several.
Marginella subfusula	1.
Veprecula cooperi	4.
Daphnella cancellata	1 small.

Acteon cratericulata	1 small.	Pupa alba	3.
Zeminolia semireticulata	3.	Tugali jew	1.
Emarginula striatula	1.	Cadulus teliger	3.
Dentalium nanum	2.	Baryspira mucronata	2 small.
Diacria trispinosa	1 slightly broken.	Zeminolia plicatula	Over 5 dozen.
Brookula contigua	1.	Nozeba emarginata	5.
Zeacolpus p.powelli	5.	Zeacolpus vittatus	1.
Awarua amoena	1.	Heliscus maorianus	1 & another broken.

I don't worry about the usual contents of beer bottles, but when this sort of thing happens, bring on the bottles !

Stan Turner.

---oOo---

OBITUARY.

It is with deep regret that we have to announce the sudden death of Mr.W.P.Thomson, a valued member of the Conchology Section for many years.

Mr.Thomson took a very active interest in the club's activities and took a particular interest in the junior members. On a number of occasions Mr. and Mrs. Thomson had their collection on display; several times for the special benefit of the juniors.

From 1947 to 1949, Mr.Thomson served on the committee. He was secretary 1949 and 1950, Vice President 1950-1951 and President 1952-1953. During the years he put a great deal of work into the administration of club affairs and in cyclostyling notes and newsletters. His opinion was always most valued.

Besides his interest in Conchology, Mr.Thomson had a deep appreciation of our Native Flora and for a number of years had been a keen amature photographer.

At Club Meetings, on a number of occasions, he showed some of his splendid coloured slides of both Native Flora and Fauna from all parts of New Zealand.

---oOo---

Editors: N.& N.Gardner.

P O I R I E R I A .

Vol. 3. Part 6. March, 1967.

A SEARCH FOR RHYTIDA YALDWYNI DELL.

O.J.Marston.

In North Canterbury and Westland several of us South Island members have, in the last five years, been extending locality records for Rhytida and Wainuia. Subfossil Rhytida have been collected up to 100 miles away from the type locality of R.oconnori. Discoveries here have stimulated our interest in their counterparts in the southern half of the North Island.

The widespread Rhytida greenwoodi group is relatively coastal, being known in the South Island by subspecies R.greenwoodi stephenensis, R.greenwoodi webbi and also R.greenwoodi cf "stephenensis". Rhytida greenwoodi webbi is found both subfossil in caves and in living condition as attractive bi-coloured shells.

The South Island subfossil R.oconnori and the even larger subfossil R. cf."hadfieldi" are not related to R.g.greenwoodi but have a subfossil relative on the East Coast of the southern end of the North Island i.e. R.yaldwyni Dell 1956

In the North Island Ian J.Payton and I, have studied topograph maps and the revelant papers in the Records of the Dominion Museum. These are listed below :-

Vol.2. Pt. III Jan. 1956, R.K.Dell:
"Some New Zealand Subfossil Land Mollusca."

Vol.3. Pt. I, April 1956, J.C.Yaldwyn:
"A Preliminary Account of the Martinborough Caves".

Vol.3. Pt.II, July 1958, J.C.Yaldwyn:
"Notes on the Environment & Age of the Subfossil Deposits of the Martinborough Caves".

The holotype and three paratypes of R.yaldwyni come from the Waewaepa Cave No.9. Puketoi Ranges, near Dannevirke collected by J.C.Yaldwyn in 1953, and described by Dr.Dell in Dominion Museum Records in January 1956. Apparently there are very few, if any other recorded specimens. When describing R.spelaea in 1933, a subfossil species found in the Hawkes Bay district, Dr.Powell referred to Mr.H.Hamilton's subfossil Rhytida collected from the Coonoor Caves, near Woodville, in 1914. Dr.Dell considers it likely that this southern record would be R.yaldwyni,as Coonoor is relatively close to Waewaepa. It would be interesting to know where Mr.Hamilton's specimen is now, as it was passed on to Mr.W.H.Hill of Taupo.

The Dannevirke caves seemed too far away for a series of week-and trips, so we selected the Ruakokopatuna Valley, south of Martinborough, in the Southern Wairarapa. We had only a slight clue to work on, as after listing the holotype and 3 paratypes of R.yaldwyni from Waewaepa, Dr.Dell gave the locality as - "Martinborough Cave No.1, Ruakokopatuna, Lower Wairarapa, at 2000ft. broken shell, 1920". (op. cit. p.135)

Apparently Yaldwyn's excavations in 1952 did not yield any R.yaldwyni, or Geminoropa spelaea, but produced a fine subfossil Paryphanta shell though. The 1920 reference is to the first excavation of this Cave No.1 (also called "Harrison's Hole"), led by Dr.J.A.Thomson, assisted by Messrs.H.Hamilton and W.J.Phillipps.

Mr.Athol Ross, Manager of Haurangi Station, made us welcome, and remembered Yaldwyn's party. As he has worked there for 43 years he was able to direct us to various caves. That day we deliberately avoided caves worked by Yaldwyn's party and looked for unworked caves. The only true cave containing some stalactites and stalagmites is flooded by a small stream, so there were no worthwhile mud deposits there. Other rock shelters and caves on the same hillside were not profitable either.

On our second expedition we located Cave No.5, the bush falcon's eyrie site. In 1952 the mud deposits were scooped off down to bedrock, but we noted that it could possibly be worth working again as mud had accumulated having washed out from other crevices since then.

At about 2,500 feet we eventually located "Martinborough No.I", a sinkhole on a ridge. It would be almost impossible to locate the entrance if it were not for a prominent limestone outcrop nearby. The entrance is only a slit about 12 feet by 3 feet. At one end there is a sheer drop of 35 feet. but at the other end there is a slope which we descended with the aid of rope. We were pleased to see "J.Y." and other initials carved onto the wall above us, and they indicated that that party may have removed above five feet of matrix from the bottom of the sinkhole. We removed some of the debris accumulated since 1952: mud, broken marine fossils, remains of hedgehogs etc. and many rotting sheep carcases. We were surprised just how deep the large maggots burrow into what was apparently merely plain clay. That night saw us the proud possessors of a portion of subfossil Paryphanta each. Snails would fare as badly as birds in crashing down from that height into the sinkhole.

On our third expedition we excavated into rich matrix in the crevice on the eastern side of the bottom of the sinkhole. This crevice had taken the "spill-over" of light bones, especially skulls from the main portion of the hole's floor. At last we were locating skulls of kiwis and the extinct North Island Notornis, and the jawbone of a tuatara etc.

There were about 14 sheep skulls among the mess of carcases on the bottom, so when we saw a bulldozer [illegible] only a chain away from the entrance, away on this mountain top, we assumed that the owners had decided to seal it over at long last to prevent further losses. With that in mind we worked harder and that night staggered down the trackless hillside with 55 lb. weight of clay and bones in our packs, and two bucketsful in hands.

Washing the mud is a slow process, especially as we were after small snails, down to 2 mm. across. The Paryphanta and R.yaldwyni had aristocratic fellow victims, as Yaldwyn lists the following as main species present :-

Anomalopteryx : Moas
Pachyornis : Moas
Dinornis : one only
Apteryx australis mantelli : N.I.Kiwi.
Euryanus finschi : extinct flightless duck
Aptornis otidiformis : large rail
Extinct N. I. Notornis
Extinct N. I. Weka.
Also Tuataras.

Among all of these mixed bones appeared the first indisputable fragment of R.yaldwyni, part of the umbilicus, about 10 mm x 4 mm, and further fragments of Paryphanta, strangely enough often the dorsal surface only, but with protoconch intact.

That made three long trips, and still no R.yaldwyni, although most interesting explorations.

My report on the number of sinkholes in this limestone region brought Mr.G.R.Annabell, President of the Nelson Spelaeological Society, across for a weekend. We inspected another sinkhole, but it had only a bone or two in. We investigated several others, but even with his handy wire ladder deemed it too dangerous to attempt them: they are of the bell-chamber type, with sheer drops of 20 - 30 feet where the ladder would be hard against rock, giving virtually no hand or feet grip, and then sudden "ballooning" out into a cavern where the ladder and climber would be swinging dangerously for another 20 - 30 feet. They could make interesting visits later, though.

We fell back on to Harrison's Hole, so continued up to it at 2,500 feet. This fourth expedition brought success at last; rain had washed a juvenile R.yaldwyni out of a lump of mud, and even the protoconch was unbroken.

The bulldozer had moved away, not sealing over the entrance, and we made better progress with a third man to help. One continued excavating in the eastern fissure, lying on one side on the cold clay, back against damp rock, head inside the fissure, and slowly scooped out bones and mud one handful at a time. Another dug into the cave floor and the third worked above hauling up buckets. The next day we made our second find; in a bucketful of mud scooped out by G.R.Annabell, up on the surface I.J.Payton disclosed our first adult Rhytida, though with a damaged lip.

For our fifth and final trip the two of us left Wellington at 5.30 a.m. and concentrated on Harrison's Hole alone. I.J.Payton uncovered a second adult Rhytida on the floor, so that gave us one specimen each, though none perfect. In the final three minutes late that afternoon I uncovered another juvenile shell, though with a broken protoconch this time.

Smaller Land Shells.

Charopa coma are relatively plentiful in the mud, and a single 4 mm. Phrixgnathus sp. has washed out too. A little further down the hillside I noted Charopids in a crevice, and I.J.Payton took a load of the gritty material home. He was excited to find about a dozen Otoconcha sp. among the grit. They are also in the mud in the cave bottom, and I have washed out eight from the matrix containing the bird bones, Rhytida and Paryphanta. Present day Otoconcha dimidiata require not only shade but moist ground conditions. There are still bush remnants in a few gullies, but most of the region was burnt sometime in the late 19th. century. Presumably the Otoconcha were contemporaneous with the kakapo and other bush dwellers; but it will be interesting to search the bush remnants for any sign of Otoconcha there today.

In Vol.3, Pt.2, op.cit. Yaldwyn does not refer to R.yaldwyni, Paryphanta, Otoconcha, Charopids, or any other land shells in his section "Notes on Some Non-Avian Remains from the Cave I Matrix" pp 131 - 132. He did note the accidentally introduced English Helicella caperata (Montagu) on the open hillsides though: I found his reference to them by accident while reading H.W.Whitten's article "Introduced Land Molluscs of N.Z." in Bulletin No.XI, 1955, of the Conchology Section of the Auckland Museum. I too had been surprised to find them at such an altitude as 2,500 ft. and so far inland too, although the calcareous soil in Ruakokopatuna Valley is their most favoured habitat, even though only grass covered hillsides.

We are continuing to wash the mud carefully, I.J.Payton has another broken adult R.yaldwyni, and I have another unbroken juvenile. Further washing and excavations will have to await my return to New Zealand. For a total of 14 man-days the total of three relatively reasonable adult R.yaldwyni, 2 good juveniles and a damaged juvenile, is hardly an impressive achievement. We have, however, thoroughly enjoyed the experiences, learnt a lot more on several topics and learnt the hard way the true value of the few specimens that we have collected.

----oOo----

NOTES OF INTEREST

What do oysters feed on ?

Feeding habits of an oyster, using the 'Giant Pacific Oyster' as an example:

The Oyster spends 17 - 20 hours of each 24 hour day, taking in water for the purpose of feeding and breathing. During cold periods when water temperature falls below 40° F., the oyster goes into hibernation and it ceases to feed, because of the lack of coordination of the ciliary motion along the surface of the gills. Under ideal conditions it filters 5½ quarts of water per hour at 77° F. In one year's time the total would fill a 10,000 gallon tank.

\- Pacific Northwest Shell News.

---o0o---

Several Snapper were given to us at the Collingwood Motor Camp, and while cleaning the fish I found that they had been making a meal of Acanthochiton zelandicus some of which were still rolled up whole, with girdle and bristles intact.

\- N.Gardner.

---o0o---

From Erol Willis :-

Three Tolema perigrina, alive, were dredged lately in 70 fathoms off Mayor Island, Bay of Plenty.

Two Tonna maoria were found at Arid Island, Great Barrier Island.

I have found that trawling with frayed out rope is quite a successful method of catching 'Poirieria'. These lovely shells which were quite plentiful in the days of seine boats, when the spines caught in the nets, are now much more scarce.

A while ago I bought a box of overseas shells - one orange cowrie reposed on the top and when the contents of the box were unpacked, another of these prized shells came to light.

Papuina pulchernimus the bright green land snail from Manus Island, is now being bred in Queensland.

---o0o---

CHIONE STUTCHBURYI, OUR COMMON COCKLE.

N. Gardner.

From a conchological point of view our cockle (Chione stutchburyi) is taken very much for granted. Probably its chief claim to notice is that is is extremely good to eat.

However, amongst the hoards of succulent specimens one can secure a few quite attractive shells, with the clean reticulated sculpture, which is characteristic of this family. (Some overseas species are most attractive and quite large too.)

If one assembles a range of specimens from the North to Stewart Island it is possible to discern a degree of variation in shell shape. The northern examples are generally triangular in outline, while those from the South Island and Stewart Island are more of an oval shape. There is also more blue colouring within, in the region of the pallial line.

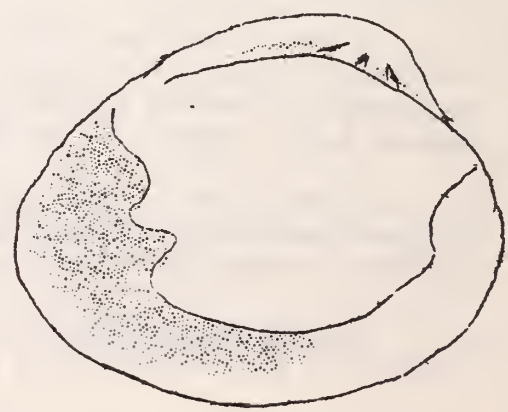
In these features the southern specimens approach the not so well known second New Zealand species which is found at the Auckland Islands.

This was described by Dr.Powell in 1932 as C.aucklandica.

C.aucklandica is a flatter shell, has a different pallial line and prominent blue colour outside this line together with a yellowish dorsal margin.

A tracing from around actual specimens illustrates the difference in shape.

Chione stutchburyi (Gray)
Whangarei,
Northland.



Chione aucklandica Powell.
Auckland Islands.

The largest C.stutchburyi I have come across is 2$\frac{3}{4}$" from Collingwood.

—oOo—

RECENT PAPERS ON NEW ZEALAND MOLLUSCA ARE LISTED :

"New Species and Records of Mollusca from off Three Kings' Islands, New Zealand" by M. A. Crozier. Trans. Roy. Soc. Zoo. Vol.8 - No.5.

"Abstract

Eight new species of Mollusca of the genera Pectunculina, Austrosarepta, Carditella, Borniola, Corculum. Thracia, Fissurisepta and Tecticrater are described and extensions of the ranges of other archibenthal mollusca are recorded. The genera Carditella, Corculum, Spinosipella, Poromya, Fissurisepta and Conus are added to the New Zealand recent fauna. "

"Introduction

In September 1962 a party organised by the Department of Zoology, University of Auckland, carried out a trawling expedition in H.M.N.Z.S. "Tui" between New Zealand's North Cape and Norfolk Island. A number of stations were established, benthic samples being collected with a beam trawl and cone dredge. All the material discussed in this paper was taken from Station A.U.Z.53, 34° 00 S., 171°55' E. on 17th. September 1962 at a depth of 440 fathoms north of the Three Kings Islands, and generously allocated to the writer for study by Dr.R.K.Dell, of the Dominion Museum, a member of the party.

From a sack full of sediment consisting mainly of coral fragments, ostracods, formaminifera, sponge spicules and bryozoans, the mollusca were sorted out in a moderately good state of preservation. Very few had been alive at the time of collection and the dead shells may have accumulated from neighbouring areas and varying depths. "

"Bulletin of the Auckland Institute & Museum. No.5. The Molluscan Families Speightiidae & Turridae" by A.W.B.Powell. - An evaluation of the valid taxa, both Recent and fossil, with lists of characteristic species.

"Abstract

The purpose of this bulletin is to list and evaluate the 549 generic and subgeneric names that have been either proposed or accepted, from time to time for use within the families Speightiidae and Turridae, to illustrate, where ever possible the type species of each presumably valid taxon, and to provide lists of characteristic species together with their distributional patterns, both recent and fossil. "

(The main change affecting New Zealand collectors is the transfer of Micantapex angastata to Lucerapex, an Australian genus.)

Vol.2. No.8. Sept.11 1962 - A Second Species of Suteria (Mollusca: Flammulinidae) and Observations of Suteria ide (Gray) - R.A.Cumber.

Abstract

Second post nuclear whorl riblet counts were made in 31 samples of Suteria ide (Gray) collected from Mangamuka in the North to Takaka in the north of the South Island. Frequencies for different geographic areas are discussed. A second species of the genus, S.raricostata is described from the Awakino Gorge. Isolating factors possibly responsible for this species are discussed.

The New Zealand genus Suteria was erected by Pilsbry 1892, for the single species S. ide described by Gray in 1850 under the genus Helix. Suter (1913) in redescribing the species records it from Whangaroa in the north to the vicinity of Hokitika in the south. With such an extensive geographic range, it is not surprising that there is some variation in form. Gardner (1954) draws attention to a very finely ribbed form from the Raukumara Range. In 1948 the writer noted a form with a relatively more mottled dark pattern from the Takaka Hill area, and the same year discovered a very distinctive second species in the Awakino Gorge.

Vol.4. No.10. March 23 1964. - Regional Variation in Riblet Frequency in the Ptychodon (Ptychodon) hectori - hunuaensis Complex (Mollusca: Charopidae) - R. A. Cumber.

Abstract

Riblet frequency in the first post nuclear whorl has been studied in samples involving Ptychodon (Ptychodon) hectori - hunuaensis complex. These were collected at 80 localities from the North Cape in the far North to the Nelson district in the north of the South Island. Although intra-zonal variation is considerable, regression lines calculated from North-South zones indicate clinal tendencies.

Vol. 5. No.17. pgs. 163 - 176. 28 January 1966. - The New Zealand species Previously Known as Zelaxitas Finlay 1927 (Mollusca: Gastropoda.) - W. F. Ponder.

Abstract

Zelaxitas, a genus previously included in the Littorinidae, is shown to be composed of species belonging to three different families. Zelaxitas cystophora (Finlay) Z.micra (Finlay) and Z.rissoaformis Powell (= Z.fiordlandica Fleming) are correctly placed in Rissoella (Rissoellidae), Zelaxitas being retained as a subgenus for Z.cystophora and Z.micra. Z.rissoaformis is included in the sub-genus Jeffreysiella Thiele. A new species

of Rissoella is described and the sub-genera of that genus are briefly reviewed. Z.alta Powell is a littorinid, for which a new genus is proposed and Z.iredalei (Brookes) is placed in Ovirissoa Hedley (Rissoidae).

Vol.6. No.8. April 9th. 1965 - The Biology of the Genus Arthritica. - W.F.Ponder.

Abstract -

The biology of three species of leptonid bivalve included in the genus Arthritica is discussed with particular reference to their mode of life. A.crassiformis lives on the large rock-boring pholad Anchomasa similis, in what appears to be a commensal relationship. External appearance and ciliation of the mantle cavity of A.crassiformis is described.

A.bifurca is shown to be free living and closely similar to A.crassiformis in structure. A new species is described which lives commensally with the sea-mouse, Aphrodite australis, in deep water.

NOTE OF INTEREST -

At the mouth of the Aorere River, Collingwood, N.W. Nelson, a typical but interesting community of shellfish occurs. The water is quite deep in places and the side of the river lined with water worn stones until it becomes shallow and fans out into a huge sand-flat. At low tide a few chains from the mouth were the usual miriads of Amphibola crenata. Under stones in the water large numbers of Melanopsis trifasciata were laying eggs and amongst them were several Zediloma subrestrata. The water tasted more fresh than salt.

Further out, near the mouth of the river, large specimens of Notoacmea helmsi were living along the sides and under damp stones. Associated with them were numbers of Zediloma arida and a few Z.subrostrata. I have noticed before that Z.arida seems to be particularly happy in a spot where some fresh water comes into the sea. e.g. near Whangarei Heads, and they seem to congregate in quite large numbers in such places.

Near half tide mark where live cockles had become stranded among the dead ones, many Axymene plebjus were living, either half buried in sand or inside shells. Though I searched further out on the sandflat they did not seem to be there - though the cockles (Chione stutchburyi) were, - large and luscious, but as the flat is very extensive and my time was limited, it is quite possible that they live further out as well as close to the shore.

- E.N.Gardner.

THE MOLLUSCAN FAUNA OF A CULVERT IN THE HEATHCOTE-AVON ESTUARY.

Frank Climo.

The Molluscan fauna of estuaries is known to be poor in species in comparison with that of rocky shores, on open coasts (Moore, 1958).

The following lists are of live molluscs collected or observed, within the culvert, and in the middle and upper reaches of the Heathcote-Avon Estuary. (only animals characteristic of a hard substrate have been listed):

Estuarine		Culvert
Micrelenchus tenebrosus		Micrelenchus tenebrosus
Zediloma arida		Zediloma arida
Zeacumantus subcarinatus		Zeacumantus subcarinatus
Sypharochiton pelliserpentis		Sypharochiton pelliserpentis
Melagraphia aethiops		Melagraphia aethiops
Lepsiella scobina		Lepsiella scobina
Notoacmca helmsi	x	Notoacmea parviconoidea
Onchidella sp.		Rissellopsis varia
		Mytilus edulis
		Siphonaria sp.
		Modiolus neozelanicus
		Perna canaliculata
	x	Scutus breviculus
	x	Guildingia obtecta
	x	Cryptoconchus porosus
	x	Acanthochiton sp.
	x	Ischnochiton maorianus
	x	Cellana radians
	x	Cellans ornata
	x	Patelloida corticata
	x	Buccinulum sp.
	x	Aulacomya maoriana

x - Molluscs not typically found in estuaries or other sheltered muddy areas.

The following observations can be made concerning the above lists :

i) There are approximately three times as many species in the culvert as there are in the estuary;

ii) relatively few species found in the estuary are obsent from the culvert;

iii) there is a certain component of the fauna which is foreign to estuaries.(The above statement is based upon several years collecting experience in various parts of the South Island).

The latter group of molluscs is typically found in the littoral and sublittoral-fringe regions of exposed rocky coasts. The group has been observed at Sumner, Taylor's Mistake, Kaikoura, Tahunanui, Separation Point, Cape Farewell and Kahurangi Point, localities along the Eastern and Northern coasts of the South Island.

None of these molluscs were found in Puponga, Pakawau, Collingwood, or Westhaven Inlets, although there were areas of intertidal rock in them all. Nor were members of this group found on the coastline between the first three inlets. (It is possible that tidal currents in Golden Bay may have prevented spat of these species reaching the inlets mentioned, but the presence of an open-coast species of Zediloma in a culvert at Puponga Inlet seems to refute this). With the exception of the culvert they were also absent from the middle and upper reaches of the Heathcote-Avon Estuary (rocks near the entrance of the estuary were not examined for this group of molluscs).

With the exception of the culverts at Puponga and Christchurch all other estuarine or sheltered areas examined had low water velocities. However, for the purposes of this discussion, the culvert at Puponga can be disregarded, since it was not flushed by every tide and so was not in effect an open-coast lowtidal zone.

It is proposed that, indirectly, the high water velocities within the culvert have allowed the establishment of certain relatively euryhaline (25 - 35 ‰) and eurythermal 'clear-water' molluscs.

The fast flow of water has prevented the accumulation of sediment, which in other parts of the estuary has possibly prevented the spat of certain species becoming established. To quote Moore (p.204) on this point ..... "Rocky and gravelly beaches may occur but the surfaces of the rocks and stones are usually covered with a film of silt. Although the larger forms such as adult barnacles can protrude through this with apparently no ill effects, settlement of the spat appears to be difficult" The presence of a 'Lithothamnion-like' calcareous alga on the rocks at the Southern end of the culvert indicates that there is no such film on the rocks within the culvert. On the other hand, the rocks in the sheltered parts of the estuary are covered by a film of sediment.

Further evidence for the proposition that high water velocities allow the settlement of relatively euryhaline open coast molluscs was provided by the presence of Zediloma digna in a culvert in the Puponga Inlet. Spat of this species must have come a considerable distance (it has not been observed on the sheltered coast between Puponga and Takaka, Golden Bay) and the conditions prevailing within the culvert at Puponga allowed their development, there. It is suggested that although not suitable for lowtidal open coast molluscs, the culvert provides a near enough approximation to some of the conditions prevailing on high intertidal rocks to allow the successful establishment of the spat of Zediloma digna

G.A.Knox (personal communication) has noted that certain animals characteristic of clear waters of exposed coasts do not extend along the whole length of Lyttleton Harbour. As the sediment load of the water increases towards the head of the harbour, the numbers of these species decrease. Salinities are constant throughout the whole harbour and, while wave action and other factors no doubt do vary along the length of the harbour they are thought not to be as important as the effect of sediment in controlling the distribution of the animals.

The above observations suggest that sediment plays an important role in preventing the establishment of open coast molluscs in sheltered waters, typified by the Heathcote-Avon Estuary, but that under conditions of artificially increased water velocity and given the presence of a hard substrate, they are capable of becoming established.

Reference - 'Marine Ecology' H.B.Moore. John Wiley & Sons; 493 pp.

—oOo—

HANDY EMULSION FOR 'SENSITIVE SKINS'

Norman Douglas.

Abstract -

The periostracum of such shells as _Monoplex australasiae_ can be preserved and dried, yet remain in appearance like that of the living animal. This can be accomplished by the use of a formalinized emulsion. It is not advisable to use a straight oil on periostracum, but, as the tanners of leather have found by long experience, an emulsion must be employed to gain the best results.

A basic emulsion:

Rain water	:	2 cups.
Knight's Castile soap	:	$\frac{1}{2}$ inch off a cake.
Cod oil	:	$\frac{1}{2}$ cup.
Sheep's Tallow	:	$\frac{1}{4}$ cup.

To prepare the emulsion:

First melt the tallow in a tin on the stove. While doing this bring the water to the boil in another container. As the water comes to the boil add the soap, as grated chips, and stir. When the soap is all dissolved pour in the hot tallow and finally the cold oil. It is best to beat up the mixture occasionally while cooling. Like a thick cream when cold it can be poured into a glass jar for storage.

About the emulsion:

The formula above can be regarded as a basic emulsion the principle of which stems from antiquity in the tanners trade. Both the ingredients and their quantities can be varied to gain various results. If the emulsion is required thicker then use more tallow; if thinner add more water; if more oily add more oil. Different types of oils can be used and also different types of soaps. It can even be scented if you wish ! An emulsion, as above, is basic for leather goods requiring lubrication. For example: bridles, boots etc. Just rub it in then polish the surplus off with a rag. On dry leather it does not cause "oil burn' as straight oil does. To professional leather-men emulsion is a "must". It is also quite a good emollient for dry hands and useful in the final polishing off when cleaning some kinds of smooth shells (volutes, for example). The emulsion is not acid, in fact it appears to be slightly alkaline by a litmus paper test and this makes it possible to add formalin, which is a slightly acid preserving agent, without the emulsion becoming acidified. And that, of course, brings us to the periostracum, or epidermis of shells - shells which cannot stand acid, except as a brief spot treatment.

Preparing the shell:

We will presume that a fine specimen of Monoplex australasiae has been found alive and that it is desired to save it in a life-like condition, with its wonderful periostracum and strange long hairy processes. The proceedure recommended by the author is as follows :- First wash the specimen carefully under the hose using a soft brush to clean it of all loose foreign matter, being careful, too, not to damage that fragile protoconch in the process. There are a few other danger points. The periostracum must not be allowed to dry before being treated with the emulsion. This is important. Nor should the shell be boiled to remove the animal as this will do the skin no good whatever, nor the shell either for that matter ! It is doubtful if any better method is known for removing the animal than that of placing it in a solution of methylated spirits and water for about two weeks. Obtain clean white Methylated spirits from the chemist (not the blue dye commercial) and make it up at about 25 to 50 per cent. meths in rain water. The container can be either glass or earthenware, but not a tin which leaves rusty stains.

Removing the animal:

After about two to three weeks in the meths and water remove the animal with a strong wire implement like figure 1. Save the operculum. If all the animal did not come out in one piece then remove the rest with the light wire "corkscrew" (figure 2) and a hose. This light wire corkscrew-like implement is easily formed by winding the wire about a wooden mandril (figure 3) starting at the thick end and working towards the point. Usually this method is successful in removing all the animal but if a very small piece remains at the tip of the spire it is recommended that the shell be filled with water, changing this every few days with the hose until no odour remains. It is during this period that the emulsion is applied to the periostracum.

Add formalin:

Pour off about an egg-cup full of the stock emulsion described above and add a teaspoon of formalin. Stir it up then plaster this all over the periostracum of the shell. Be sure not to let the emulsion dry on the shell or a sticky mess, very hard to remove, will result. Keep it wet with the emulsion for two or three days when all trace of the cream should be carefully removed with warm to hottish water and a soft brush. It is now ready to dry.

Drying:

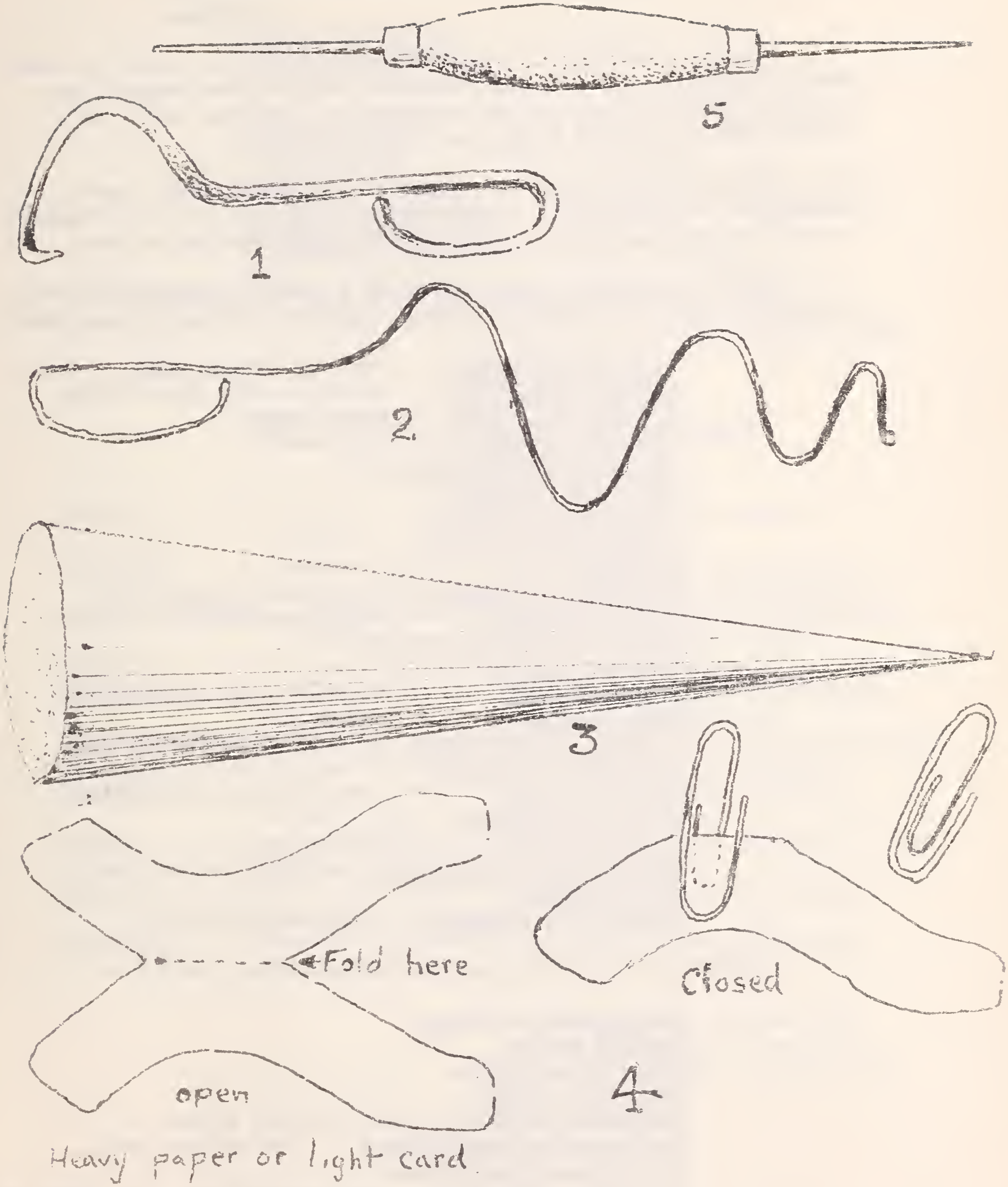
First rinse out the inside of the shell with pure methylated spirits. This will pick up the water and promote a much faster drying of that part. Having washed off the emulsion with warm water, as mentioned above, the epidermis is ready for drying. If allowed to dry unattended the rows of hairy flanges will curl up. To prevent this cut pieces of light cardboard to shape (Figure 4) and pin each flange between, using wire paper clips as shown. After a couple days drying in the shade the card holders can be removed. A pad of cotton wool is then pressed into the aperture of the shell and the operculum stuck to this by the use of a suitable clear glue, such as ATAGLU. By dipping the rounded point of a piece of wire, or a tracer tool (Figure 5), into the glue and rubbing where required, the cotton wool can be made to lie down smoothly. Coupled with the use of suitable dyes, quite a life-like imitation of the animal, where it shows, can be made by this method.

Storage:

It is preferable to keep the completed specimen in a tray cabinet. Certainly do not leave it in the sun which is the worst possible environment. Given a good specimen to start with, followed by a thorough job on the preservation, your specimen should cause many an exclamation ! Especially will this be so from those used to the sight of the Monoplex in most collections !

Good luck in the hunting. But don't take a specimen too young (the shell is too weak), or too old and encrusted. The specimen must be just right - just full grown, about 4 inches long, with the shell just thickened inside sufficient for strength.

---oOo---



The figures referred to in the text. About natural size for Monoplex. N. D.

COLLECTING AT GREAT EXHIBITION BAY.

R. Willan.

For two weeks during the Christmas holidays we camped at Great Exhibition Bay about 40 miles from Cape Reinga. The weather was fine for the most part but on our second to last day there was a gale of about 60 knots which blew the tent over.

On the beach we found evidence of Japanese fishing boats working in the vicinity: a glass float, a plastic float, a Japanese sandal and several wooden crates with Japanese writing on them.

Before we arrived, there had been a terrific storm which had driven many shells up onto the beach. Amongst the washups we found:-

Tonna haurakiensis - most had broken lips.
Quibulla subtropica - not common but good shells.
Maoricolpus roseus - common about 3".
Zeacolpus pagoda - very common.
Zeacolpus ahiparanus -
Ellatrivia memorata
Nassarius aoteanus
Architectonica reevi
Liratilia sp. ?
Xenophalium labiatum, *X. pyrum* and *X.collactea*.
Janthina globosa - large and perfect.
Haliotis virginea crispata.
Fusus mestayerae.
Pteronotus eos - Three but only one perfect.
Tanea zelandica - common.
Notocochlis migratoria - A large perfect shell.
Poirieria zelandica.
Charonia capax - Recently dead with opercs.
Alcithoe depressa.
Vicimitra maoria - A broken one.
Notocallista multistriata - A large perfect shell.
Bassina yatei.
Longimactra elongata - Many perfect shells.

The hermit crabs were most profitable. They yielded :-

Notocochlis migratoria.
Mamilla simiae.
Nassarius spiratus.
Cominella youngi.
Cominella quoyana - many in sandy pools.
Austrosassia parkinsoniana - One in deep pool.
Cabestanimorpha exerata.
Zeatrophon ambiguus - very common,crabs like these shells.
Agnewia tritoniformis
Poirieria zelandica
Tonna haurakiensis - This one had a very large crab inside.

Found alive round the rocks and clinging onto seaweed were:-

Maurea punctulata - on seaweed.
Zeatrophon ambiguus - on rocks.
Cominella adspersa melo - large shells, burrowing in sand.
Necthais scalaris - many alive amongst rocks.
Charonia capax - under rock ledges.
Charonia rubicunda - 2 juveniles also under rocks.
Monoplex australasiae - among seaweed covered rocks.
Cabestana spengleri.
Cantharidus purpuratus - on kelp, common.

The Charonia, Monoplex and Cabestana are still alive and growing in my tank. They serve to remind me of this memorable trip.

---oOo---

TERMS FREQUENTLY ENCOUNTERED IN LITERATURE DEALING WITH MOLLUSCS.

Holotype :- The original type, a single specimen on which a species is based.
Paratype :- A specimen collected at the same time and place as a holotype and used also in defining a new species.
Ecotype :- Minor races exhibiting rather distinctive characters often due to effects of a local environment.
Genotype :- The characteristic species on which a genus is founded.
Homeotype :- A specimen which has been carefully compared with and identified with an original primary type.
Hypotype :- Not from the type locality; a figured or listed specimen.
Lectotype :- A specimen on which a revised species is based.
Monotype :- The original shell of a species which is described from a single specimen.
Neotype :- A selected specimen to replace the original type if lost or destroyed.
Syntype :- One of several specimens of equal rank upon which a species is based.
Topotype :- A species collected at the same locality where the original type was found.

Information gleaned from "A Glossary of thousand and one terms" W.H.Arnold.

---oOo---

A LIST OF SMALL LAND SNAILS FROM LEAF MOULD TAKEN AT ORUAWHAROA, GT. BARRIER ISLAND - 1966.

Liarea egea (Gray)	Cytora torquilla (Suter)
Allodiscus planulatus (Hutton)	Therasiella tamora (Hutton)
Therasiella celinde (Gray)	Suteria ide (Gray)
Charopa coma (Gray)	Flammulina costulata (Hutton)
Charopa ochra (Webster)	Ptychodon pseudoleioda (Suter)
Fectola buccinella (Reeve)	Ptychodon hunuaensis Suter.
Laoma marina (Hutton)	Subfectola caputspinulae (Reeve)
Laoma leimonias (Gray)	Geminoropa subantialba (Suter)
Phrixgnathus erigone (Gray)	Phrixgnathus cheesemani Suter
Phrixgnathus ariel Hutton	Tornatellinops novoseelandica (Pfr.)
Delos coresia (Gray)	

N. G.

—oOo—

NOTES ON A COLLECTING TRIP TO EAST CAPE

Warren Judd.

The tides during the Xmas holidays were poor for low tidal collecting but the area proved very interesting nevertheless.

Buccinulum in various forms were common especially B.colensoi and B.multilineum which were found at Tatapouri along with several small molluscs including Marginella mustelina (a number of the usual forms and one albino), Thoristella oppressa, Neoguraleus, Merelina and many minute Eatoniella and Estea. Among these was Estea rekohuana. Near Tolaga Bay I set off for a $\frac{3}{4}$ hour hike to a likely collecting spot where, in spite of the tides being poor and my time limited, the bay yielded some good specimens. There were superb Buccinulum colensoi $\frac{3}{4}$", clean, with very well developed lips, B.multilineum and three specimens of a very distinct pure white one - maybe B.sufflatum alive under a rock, and also Argobuccinum tumidum, Mayena australasia and Micrelenchus - all alive under rocks. At this spot was a fantastic place for limpets - a great ledge which you could walk along inside about 6 ft. from overhang to shelf. Around this I found the following species :-

Notoacmea pileopsis (common, large)
Patelloida corticata (very common)
Notoacmea pileopsis cellanoides (not common)
Notoacmea daedala
Notoacmea parviconoidea (a few)
Cellana ornata ($1\frac{1}{2}$" common and clean)
Cellana radians.
Cellana radians flava (quite common)
Cellana stellifera (a couple, low down)
Siphonaria zelandica.

We moved on to Te Araroa and I found the coastline round about very interesting. Apart from numerous forms of Buccinulum and other shells, I was intrigued to see the following phenomenon :-

In the mid littoral pools on a seaweed that was common here but which I cannot recall having noticed elsewhere except, perhaps at Mayor Island, (a small darkish green species), were literally thousands of Aplysia tryoni. They were dark reddish brown with a few lighter lobal markings and ranged in size from about 25 mm. up to 90 mm. Most were about 60 - 70 mm. When interfered with they released a purple dye.

I counted 17 to a square yard in a favourable spot but there must have been about 8 to the square yard, on an average. They occured on this seaweed as far as I went in either direction. I stopped ½ a mile further back down the road and the Aplysia were there also. I did not have the chance to investigate further as the light was fading but there must have been millions. An area 400 yards by 20 at a density of 8 per square yard would equal 64,000 specimens ! They were laying eggs and feeding on the seaweed. I have a complete egg mass preserved on the seaweeds - the egg masses are large and contain vast numbers of eggs of minute size, yellow in colour laid in a gelatinous ribbon which is quite long, and twisted into a mass of knots. Each individual egg is scarcely visible to the naked eye.

At Hicks Bay, our next camping spot I found Cellana denticulata on volcanic looking rocks and, surprisingly, a very few Cellana radians flava, with them. C.denticulata, though usually a southern species does occur in odd places in the North, e.g. Cape Maria van Diemen, Cape Brett and East Cape. In the East Cape area a number of typically far northern shells occur in the living state - Marginella mustelina is quite common in some places and Ellatrivia memorata turns up quite frequently, though live ones are hard to come by, as usual. I found a deep pool with a lot of algae and smooth stones in the bottom. I hopped in - it was cold and deep and the mosquitoes were fearful, still it was worthwhile as I found a number of live Haliotis virginea crispata, two live Buccinulum robustum, and another Buccinulum which seems to be a link between B.heteromorphon, B.vittatum and B.colensoi. It has size and shape of B.heteromorphon, colour bands of B.Vittatum but a heavier shell and prominent nodules on all whorls, all of which are crossed by deep spiral lines. I was most surprised to find a live Fusus mestayerae, usually a northern shell and nearby were also very fine specimens of Eudoxochiton nobilis.

We camped at Oreti Point for three days and it proved a great place for small shells amongst washups. Here again a number of species seemed more usually found in the North. Some of the shells I sorted out were :-

Pellax hutteni (not uncommon)
Estea sps.
Merelina sps.
Rissoina zonata (common)

Rissoina sps. (in addition to chathamensis)
Z.Zebittium exile
Lyroseilia chathamensis (large)
Zeacolpus pagoda
Epitonium philippinarum
Epitonium jukesianum
Cirsotrema zelebori
Janthina exigua
Trichosirius inornatus
Ellatrivia memorata
Mayena australasia
Agnewia tritoniformis
Zemitrella sps.
Austromitra rubiradix (very fine, common)
" rubiginosa " " "
" erecta " " "
Macrozafra sp. most distinct oblique axial ribs with spiral lines covering a brown shell (M.subabnormis saxatilis ?)
Proximitra obscura (many broken)
Marginella mustelina
" pygmaea
Neoguraleus several sps.
Pervicacia tristis
Pteronotus eos (small battered brownish looking but unbroken)

At still another beach washups were good and I collected Macrozafra subnodosa (a far northern species), Turrid sps., Pupa kirki, 1 worn Vicimitra, Powellisetia, Austronoba and Notosinister 3 sps. as well as some that I had picked up earlier. I saw a few broken Cantharidus opalus on the beach so on two mornings took off out to sea wading in the kelp up to my waist and beyond and got - for about 2 hours work 9 Cantharidus opalus (mainly juveniles) all alive, but two mature specimens were very eroded, 6 C.purpuratus alive and some fine Micrelenchus - it was cold though.

Regrettably the whole trip was marred by poor weather and on most days rain occurred - some days just light showers at inconvenient moments and others 15 hours of solid heavy rain - the Caravan awning almost floated away !

---oOo---

Editors: N. & N. Gardner.