

bly been adopted for greater safety in the exposed tree tops; to the same end every superfluous atom of weight has been abandoned, the shell reduced to the thinnest, and the reflected lip dispensed with. Under the lens the apex is seen to be of one and a half whorls, black or darker than the adult shell, smooth and subglobose. Oblique growth lines are the predominant features of the adult sculpture; by flashing the shell in the sunshine under a lens, an extremely minutely shagreen surface is perceptible in the gleam, and here and there broken lengths are decipherable of engraved spiral lines. Viewing the shells of these three species by transmitted light the color markings are seen as translucent spaces in the opaque shell. I should interpret these signs as indicating a descent from an ancestor like *naso* and *macgillivrayi* through a form very close to *bidwilli* Pfeiffer.

The minute almost imperceptible shagreen surface may represent the coarse sculpture of *naso*; the evanescent spiral lines are traceable from the clear cut lines of *macgillivrayi* through the fainter sculpture of *bidwilli* Pfr., to their vanishing representative in *bidwilli* Cox. But the minute subglobose apex and especially the translucent spiral color bands ally this group unmistakably with *Papuina*. Admitting this, in default of anatomical examination, it will be necessary to rename the shell hitherto known as *Bulimus bidwilli* Cox, lest it should clash with that other *Papuina* described by Pfeiffer as *Helix bidwilli*. I therefore propose that in allusion to its peculiar habits, it be henceforth called *Papuina folicola*.

Between these leaf-dwelling *Papuina* of Queensland and *Bulimus mageni* Gassies, of New Caledonia, I note a strong resemblance in color, form and sculpture, but especially in their translucent color bands. Until further research settles authoritatively the position of this species I would provisionally class it with the foregoing.

SAN PEDRO AS A COLLECTING GROUND.

San Pedro, California, is remarkable for the number and variety of recent and fossil mollusks.

New forms and an unusual abundance of known species are constantly being found.

This is due in a great measure to the extension of the Government breakwater, which has made changes in the sea currents near the

shore, and caused the tide water of the harbor to scour out the channel and drift large quantities of sand over the shallows.

By this means new homes are made for wanderers, and old inhabitants are washed from their moorings and swept by the tide within reach of eager Conchologists.

It is surprising, however, how seldom the year's abundance of any species repeat themselves.

At one time *Nassa fossata* Gld., at another *Periploma discus* Stearns; at another *Lima orientalis* Cpr.; or *Scalatella striata* Cpr., are found by the dozen, or score, or hundred in San Pedro Bay or vicinity, and then for years after only a few are found at a time.

The sea conditions are unsettled. This keeps local collectors alert.

Within a few months I have found a specimen of *Tritonium gibbosum* which is new to California, and one of *Cylichna cylindracea* var. *attonsa* Cpr., which is new to San Pedro. Both shells are beach worn.

This summer I spent July at San Pedro and added a number of new specimens to my collection besides learning many interesting facts about habits and habitat of molluscs.

A student only gets a half knowledge who cannot collect specimens and study the living animals in their native haunts.

July seems to be a favorite month for many species to lay their eggs.

Mitra maura (Idæ), fastens her capsules to the underside of stones; the Naticidæ place their "sand collars" in the damp sand; *Bulla nebulosa* Gld. coils up her yellow strings on the grassy flats, and *Haminea virescens* Sby. chooses the same place and time, but has a different shade of yellow for her egg-strings.

I was much interested in the eggs of *Actæon* (*Rictaxis*) *punctocælatus* Cpr.

This mollusk has been rare, and I am inclined to think it only comes inshore in numbers during the breeding season and after that burrows in sand in deeper water for the rest of the year. In July we found them by the hundred.

The eggs are laid in a white string three or four inches long that coils so as to form a loose spiral.

The spirals are anchored, by some means, so firmly that the washing of rough surf does not sweep them away.

They so closely resemble the spiral pattern on the adult shell that the collector, looking down through the water, not unfrequently stoops to pick up what he thinks is one of these little gasteropods and finds a string of eggs in his fingers.

I visited Portuguese Bend and learned that *Purpura emarginata* Desh., which I found in quantity more than a year ago, is a resident or a comer and a goer, for more than a dozen were collected this summer. Its habitat is limited to a small mussel bed.

Other localities so much like this mussel bed, that one would consider them suitable dwelling places do not boast of a single *Purpura*; so that something besides collectors must disturb this usually common species.

I collected at San Pedro an abundance of *Acmæa paleacea* Gld. on the eel grass.

These close clingers love the grass on the outside of the island that is swept by heavy swells and where the water scarcely leaves them even in very low tides.

Their more peaceful cousins *Acmæa depicta* Gld. will probably be found swaying with the grass in the stiller waters of the bay, for dead shells have been frequently found in the drift.

In the quiet bay quantities of drift material are washed up with algæ and eel grass during medium tides.

This is rich in minute forms. It consists largely of broken shells of molluscs and crustaceans, but there is a sufficient quantity of *Pedipes*, *Siphodentalium*, *Tornatina*, *Cæcum*, *Truncatella*, *Mitromorpha*, *Turbonilla*, *Cerithiopsis*, *Triforis*, *Diala*, *Mumiola* and other wee bodies to amply repay any one for carrying away a few pounds of the drift to be dried and sorted at home.

The sifting and the sorting with a microscope takes so much time and patience, that the new and rare species hidden in my bags of drift must wait a more convenient season.

The yearly extension of sand flats at San Pedro, must make happy all sand loving species such as *Bulla*, *Sigaretus*, *Natica*, *Olivella* and scores of bivalves.

Besides these sandy stretches there are mud flats, rocky points, brackish water, fresh water, smooth or rocky beaches enough to make San Pedro an ideal collecting ground.

Although nearly all the localities are easy of access for the Conchologist, or the collector who "makes shell flowers," there are changes enough taking place to insure a good supply of shells.

A storm that stirs up the depths makes a grand holiday, but nearly every visit, in storm or calm, repays the student by some glimpse of the life history of some soft—hard dweller of the sea.

Sarah P. Monks.

PRELIMINARY NOTES ON TASMANIAN LAND SHELLS.

BY HENRY SUTER.

Since I became acquainted with the New Zealand and Tasmanian land and fresh water molluscan fauna, some four to five years ago. I came to the conclusion that both are very nearly related, though this opinion is not shared by Conchologists generally. On several occasions I expressed my views, especially when describing *Charopa subantialla* and *Ch. mutabilis*. It is well known that no attempt has been made to classify the Tasmanian land shells; all the Helicidæ have been simply placed in that “*olla potida*” genus *Helix*, Mr. Charles Hedley of Sydney, was first to publish structural details of the animals of some Tasmanian land shells (Proc. Linn. Soc., N. S. W. (2) VI, p. 19). Descriptions and very good figures of the animals and the dentition were there given of *Bulimus dufresni*, *B. tasmanicus*, *Anoglypta launcestonensis*, *Rhytida lampra*, *Helicarion verreauxi* and *Cystopelta petterdi*.

I have not been successful in procuring land shells with their animals from Tasmania, and I therefore decided to sacrifice part of my collection. There were some specimens with the animal dried in them and these I used for preparing the jaws and radulæ. I have just finished the microscopic slides and have not yet had time to study them carefully. However, I ascertained a few facts, which, I feel sure, may prove of great interest to Conchologists, though my communication is only provisional.

Conchologists of course know that the genera *Endodonta*, *Charopa* and *Rhytida* are common to New Zealand and Tasmania. The new facts I ascertained of genera or sections of genera found in New Zealand as well as in Tasmania, and part of Australia in some cases, are the following :

Genus *Gerontia*.

Section *Flammulina*, thought to be confined to New Zealand only. I think that *H. Jungermanniae* Petterd, belongs to this section, though I am not yet quite positive.



Monks, Sarah Preston. 1893. "San Pedro as a collecting ground." *The Nautilus* 7, 74-77.

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