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SHELL COLLECTING IN HAWAII

By A. H. Cornelison

Shell collecting in Hawaii is an interesting hobby. For some reason not yet explained there are not only quite a few endemic species (not found anywhere else) but also shells common to the Pacific and Indian Oceans attain here both size and color vividness not found in other parts of their habitat. It is a difficult hobby, however, due to the fact that Hawaii does not have the profusion of numbers found in warmer waters, and shells are not easy to find. It must be remembered we are not collecting dead "beach" specimens but are after live and kicking "in habitat" items. The life habits of shells are pretty well a closed book (which is only now coming open). Tomes on taxonomy have been written, but not one book on food habits, breeding habits, life expectancy, depth of water, temperature of water, type of bottom or marine vegetation will you find, now will you find mentioned that shells, almost without exception, are light phobic, even to pale moonlight, and that they head for the darkest spot that their method of movement will let them find. Only the morons ever get caught out in the light of day. Until you learn slowly and painfully some of the beasts' habits by hours of search, the hunt is a pretty blind one.

First we should know that shells are largely carnivorous, preying on other sea life as well as going in for a bit of cannibalism on the side. A few species, notably the cowries, are herbivorous and feed on marine vegetation of one sort or another. Starting here we can draw the conclusion that the vegetable feeders will have to stay in the depth zone where enough light filters down through the water to let photosynthesis operate and plants grown. This is somewhere between the surface and roughly 100 to 150 feet down. When we consider the carnivorous species, there are no such limits -- where their food species can live, there they will be found, -- some exist at preposterous depths. These carnivores are a "dog eat dog" lot, feeding on minute plankton in some cases and proceeding up to ones that spear and poison-kill fast-moving 2 and 3 inch fish. In between are those feeding on worms, sea urchins, sand dollars, starfish, slugs and even other shells of different species than their own. Almost all of the carnivores carry a dart, poison sac full of nerve poison, and a file-like set of teeth to rasp the flesh off their stunned, paralyzed, or killed prey tearing it into pieces small enough to ingest. Some of the darts (and most shells carry a whole quiver full of them) are half an inch long. The poison is now being chemically studied but no reports are available as yet. However it is, generally, a nerve poison, probably a protein or amino acid, and in six species is potent enough to kill man. Some shells will cause convulsions, numbness, temporary blindness and violent nausea, if they fall short of killing. Fortunately the human skin is tough enough to turn the spear of all but about six or seven species,which being known by their "tapa like" design can be handled with care and safely collected. One thing common to all shells is a relatively large liver compared to the shell. They can store, and fall back on this storage capacity in time of food shortage for quite a long period of time. Being of slow movement they can't catch too much prey in a given period of time, but they can "deep freeze" what they do catch,

and rely on it until they can fall upon another meal sometime later on. Sharks and many fish are so equipped to survive food shortages. When they do get a chance to eat they can take on a "whale of a lot" at a sitting.

No one knows much about how shells send out mating signals, meet, mate and lay their eggs, except possibly a little about when the eggs are found and where — in a few species. Some sit on their eggs like a hen, others appear to attach the egg stalks to their shells and haul them around wherever they go, but it's safe to say that for the most part their sex life is pretty well a private matter. When the eggs do hatch and the babies become free-swimming or water-borne they are carried far and wide by the sea currents, probably in millions. Only those who happen to land in a happy location with adequate food and salinity, aeration and temperature all equable, will survive. Here in Hawaii these happy locations are few and far between. When we collectors find shells under rocks at some "secret" site we are careful to turn the rocks back into original position and disturb nature as little as possible. A rock turned over and left, will "sunburn" thirty feet down and never another shell will you ever get from under it. Turned back as it was, it will be harvestable again next year, and you'll find shells. The writer has seen several wonderful shell beaches on Oahu wiped out completely in the last five years alone, by lazy, wanton collectors. That is why most of the "old timers" keep their "shell holes" to themselves and are so secretive about collecting information. You can't blame them!

There are several methods of collecting: (1) "Box" collecting in shallow water (2) "Snorkle" collecting (down to ten to fifteen feet) (3) "Aqualung diving" to a safe depth of sixty feet and also for those who like to "live dangerously" on down to 200 feet (and the "bends") (4) "Dredging" with a towed screened dredge (5) "Night collecting" with a Coleman lantern or flashlight (6) "Buying" or "Horse Trading" shells from some one who goes in for the first five methods. This latter method is easy, except on the pocket book; it allows the amassing of a lot of superb shells which the owner can name glibly, and about which he knows nothing, really. This kind of collecting is for those with the "possessive" instinct rather than the "scientific". I don't even want gift shells from a brother collector as consolation for a "baldhead" day, when one does happen. For elderly persons this is about the only way a collection can be had -- collecting being a bit on the cool, wet, athletic side. Much of the thrill is lost if you can't say "I got him myself" and relive the episode in memory.

We'll now get down to the actual equipment and "how to do it" of each of the methods listed above.

For the first method, Box collecting, a glass bottom box, a fairly heavy duty pole about six feet long with a "jimmy bar" tip to turn over rocks, some old shoes, a shallow reef and low tide and you have it made. You find a rock or coral head, heave it upside down and when the murk clears away you look for shells adhering to it, or in the sand under it. This method always unearths eels, star-fish, urchins and occasionally an octopus to keep the blood pressure up -- also some shells.

Method two, Snorkle, calls for swim fins, a snorkle, a mask, gloves and a pole, and differs from No. 1 in that you swim over the bottom watching for "tracks" in the sand and you dive down to turn over the rocks on coral bottom. It allows one to cover considerable area too deep to walk over or too rough to traverse and one can get through surf that would knock ones brains out "box collecting". It gets cold, really wet, and will develop good lung power if you keep at it. Go at this method wholeheartedly and you will find that you have quite a few muscles you never were conscious of before.

Method 3, the use of the Aqualung to go to greater depths was described in another article.[1]) This method requires some more equipment -- a tire float, knife, lung and

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1) Cornelison, A.H., Aqualung Diving. Elepaio, V.18, No. 11, Pp 72-75.

bottles of air, probably a rubber shirt, mask, snorkle, pole, fins; and you are off for the depths. This method allows coverage in depth but is somewhat limited in acreage coverable before you and the air play out; it is generally cold at any time of year and it is definitely "athletic" in physical demands. However it gets one to ideal depths for shells and lets one stay there for an hour. It has its hazards of embolism, bends, cramps, sharks, and coral cuts from getting about in rough weather. This method has opened whole new fields in the shell game -- species once thought rare now are commonplace finds, and it has brought to light many new species. Mainly it allows one to establish the life habits, and habitat conditions of species never before understood. The recent increase in shark incidence has cooled this method off somewhat. It is, however, notable that no one in a lung has ever had any shark trouble so far here in Hawaii. This is probably due to the unconscionable row made under water by an Aqualung-- high pressure squealing air, bursting bubbles in the exhaust column, snorts from the exhaust valves, all must sound quite formidable to the average shark.

However the "lung" man getting to and from the diving grounds by surface snorkling is completely exposed and probably liable to the multiple repeated attacks that have occurred among skin divers and snorklers while at the surface. The aqualung diver is probably safer than the free swimmer, percentage-wise, whatever that may mean or amount to. Most of us lung divers sometimes wonder just what we <u>are</u> doing, way out and way down where we are. This lonesome feeling can get acute if you can't see your buddy or the anchor line to the boat or the anchor line to your tire-float, far above, on occasion. Sorry for this deviation but it is bound to be brought up by someone sooner or later -- so we deviated.

The last method, Dredging, requires a good strong boat and motor, a strong steel frame, wire-covered box structure with a "bulldozer blade" leading edge, about 1000 feet line 1/8 to 3/16 inch in diameter, gloves, a strong back and a weak mind. The dredge does some of the work. You drag it along the bottom, in sand and light coral if possible, and it plows through or mows down all in its way, scoops up the loose stuff from sand to a depth of six inches, or the broken coral it is plowing down. When it is full you pull it up hand over hand -- generally two men in a team as the thing is heavy. The dredge is used generally from 70 to 1200 feet and thus below normal "horse sense" diving depth, so the job of recovery can be really a back-breaker. You get shells unobtainable any other way, but you don't learn much about how they live and die. There is quite a sense of gambling thrill about his method that takes some of the boredom out of it however. In general the construction of the dredge, engineering-wise, is tricky -- one will work well while its exact twin may be a complete lemon. Quien sabe?

The next method is Night collecting, using a Coleman lantern, or an electric torch. Reference to a tide table will tell you when there will be a "minus .2" tide at night. You get into trunks, sneakers, fire up the lantern and head out into relatively shallow water, 2-3 feet, with a glass box and a pole, if you can carry it all. As we said before, shells are light phobic and therefore do their feeding at night -- preferably in the dark of the moon. Thus with a lantern you catch them out cruising around on top of the reef. Many show scratch-like tracks in the sand holes in the reef -- they are at the "lumpy" fresh end of the scratch. Others are on the coral itself and may give themselves away by exposing a bright mantle, or a bright "foot", or the whole shell may be covered by a colored animal body. One thrill of this method is to stay out too long with an incoming tide and to get caught in the deepening water with the lantern and in some cases with suddenly developed mill race, waist deep currents heading for a reef, channel or pothole. It can get awfully dark and lonesome when the lantern goes out due to no gas, your falling in a hole, or a broken globe. Two persons, with two lights in the gang is to be recommended to avoid this little complication. These night operations can be lucrative in other ways. The long legged, spotted, red night octopus may be picked up, the white eel (which is excellent eating, by the way) and lobsters are also out, as well as a group of fish you can spear with a hand grain or multiple tined spear. You would be advised that a good wool turtle-necked sweater

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or parka hooded sweat shirt is mighty comfortable on the reef at night -- it can get darned cool out there about ten o'clock.

The last method, Buying or Horse-trading, requires a bit of Scots, Chinese or Semite blood to be economically successful -- enuf said! There is no established price on a shell or species except what the market will bear, so -- "Caveat Emptor".

Finally at long last -- what do we get? There being only a few "common" names for shells and most of them being wrongly identified one is forced to go to the scientific names which in most cases are tongue twisters, meaning something probably to scientists of the hard-shell variety, but in general are just a label to the average collector. One gets a shell, finds it illustrated with the "at the moment" accepted title and that's about it. This "title" may be changed by some scientist, pseudo-scientist or taxonomist four times in three years and if one tries to keep all his labels "up to date" in the collection trays he is liable to turn the air blue with frustration some day. Most of us know we have the shell and let the new names run rampant through the literature. You might say we are so busy collecting that we can't be too upset by some "armchair operator" changing the names on us! Actually some of us get a perverse pleasure out of the rather heated battles between the schools of namers who "have at each other " over some shell that has long since been collected, described in four or five places by different names in the literature, its habits have been described, and it is really a dead issue, especially if you have the shell.

There is a bit of healthy competition in getting bigger or better specimens; finding out some life habits or facts about a species, or in getting a series by age of a given species, that can keep up interest in the hobby when the more interesting rare endemic species just are not around to be found, as often happens.

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TERRITORY OF HAWAII
BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY
Honolulu 14, Hawaii

November 19, 1958

Miss G. Hatch
P.O. Box 5032
Honolulu, Hawaii

My dear Miss Hatch:

In response to your request for information on the introduction of the Barn Owl to Hawaii, I am setting forth the following:

At the request of the undersigned, Hawaii's Commissioners of Agriculture and Forestry on March 20, 1958, after obtaining the opinions of the members of their Advisory Committee on the Introduction of Animals and Birds, approved the introduction of Tyto alba pratincola (Aluco pratincola) from California for control of rats and mice.

Subsequently three shipments were received on April 2nd (4); June 6th (5); October 7th (7) for a total of sixteen (16) individuals. The first and third shipments were obtained through the courtesy of Mr. Paul Breese, of the Honolulu Zoo, from the San Diego Zoo. The second shipment was obtained from the California State Fish and Game Commission.

The first shipment was held at the Honolulu Zoo until April 23rd when three birds were taken to Kukuihaele, Hawaii (edge of Waipio Valley) and released. One bird in

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this shipment arrived with a broken leg which did not respond satisfactorily to treatment by our veterinarians.

The second shipment, after examination, was shipped to Hawaii and released at the same location. One bird was found dead the next day, June 7th.

The third shipment was taken to Hawaii on October 8th and released at the same location. An individual believed to be from this shipment was found dead two days later.

Prior to shipment the birds were examined and certified as free of infectious or contagious disease. On arrival they were examined and found free of ectoparasites.

Since the initial release date, numerous sight observations have been made of barn owls by employees of Honokaa Sugar Company and other residents of the general area. In most instances the observations have been made at dawn, the bird being flushed by motor vehicles from the road. In many of these instances, the observer has reported the bird to be carrying a rat.

Additional shipments of T. alba pratincola are anticipated next spring and will be released in the Kukuihaele area. This area was selected for the initial establishment because of the wide range in environmental conditions within relatively short distances from the release point.

I trust that the above information is what you desire.

Yours sincerely,

(S) Alan Thistle
ALAN THISTLE, Director
Division of Entomology
and Marketing

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FIELD NOTES:

Field Trip, November 23, 1958, to Poamoho Trail.

Toward the end of the week the cold front had moved into Hawaii, so we did not expect much rain, but to our dismay by 7:00 a.m. on Sunday both Koolau and Waianae Ranges were heavily clothed with dark rain clouds.

As we drove toward Wahiawa, we noticed that the eucalyptus and the melaleuca trees were in bloom, so 16 of us (members and guests) were hoping for drier road conditions than we found on August 10th, when we were forced to turn back.

When we arrived at the turn-off point from the paved road onto the dirt one, we noticed that the road to the trail was soaking wet, and while one group of rain clouds were swiftly moving away from the Koolau, another group was just as quickly moving in. After scrutinizing the situation the three drivers decided the road was firm enough to drive over it without skidding too much, so with contained enthusiasm we headed toward the trail. The three cars were able to make it to the end of the jeep road without much difficulty.

We were richly rewarded for the decision to brave the rain. As we got out of the cars and looked down into the valley, we found ourselves in a fairyland. Every tree and cobweb was be-jeweled, but the glittering was softened by the lifting mist. As the enchantment became less intense, we started to hear birds, insects, and the gurgling of the water.

Apapane were everywhere. They were busily calling and flying from one tree to another. The most impressive experience was to see the red and black flashes of apapane against the sparkling dew on the trees and also against the swiftly moving shadows of the clouds as they passed over the nile green of the koa, the silver green of the kukui nut, and the darker green of the lehua, which was accentuated with the intense red of the young leaves.

As we gingerly stepped into the enchanted valley, we realized that the trail was muddy and the occasional showers were making it quite slippery. Even with the wet nippy air, birds were busily calling and feeding. As we approached the trail where the strawberry guavas were growing, we saw a few leiothrix. There were some ripe guavas, but the leiothrix were alarmed and we were unable to determine whether or not they were feeding on the ripe fruit. There were evidences of feeding on the fruits, but most likely they had been eaten by the white-eyes, for we had seen some of them busily feeding on the guavas until they saw us.

Somehow elepaio was quite shy and we saw only a few, but on the other hand we thought we heard iiwi several times,but until our return trip we were doubtful. We heard this single melodious bass note quite close by, so we waited for movements to reveal the bird. Sure enough, in a very short while iiwi with its brilliant red color and curved beak perched on a branch quite visible even without the glasses.

As we went farther on the trail, there were fewer birds. The New Zealand heather plants were blooming, but either they lack nectar or the day was too cold, for there was no bird nor honeybee around the delicate pink and white blossoms. We often had heard the bush warblers in the glen of lush lehua and koa trees, but there was no sign of them. The only birds we heard as we approached the lookout were the occasional apapane and the leiothrix. We were surprised to find the absence of the usual strong wind at the lookout. The quietness added to the peaceful slumbering of the Punaluu Valley. After a brief stop here for lunch we headed back on the trail.

Now that the rain clouds were all blown away, the return trip was quite dry, but we saw very few birds. The most unexpected event came when we started on the jeep road. We were contented and sauntering along the homeward stretch, when suddenly, a human-like whistle was returned for my whistling call. Unbelievable! While I stood undecided whether to call again or be quiet, the whistle was repeated again and again as though to reaffirm that the garrulax was still at Poamoho. We asked for no more. A perfect finale for this most wonderful day.

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Usually the trail offers more birds, but when the eucalyptus and the melaleuca trees are in bloom the jeep road is better birding. The comparative bird counts are as follows:

Birds	Trail	Jeep Road
Amakihi	9	12
Apapane	35	79
Elepaio	6	8
Iiwi	1	7
Garrulax	-	1
Leiothrix	11	29
Ricebird	8	8
White-eye	7	28

On our way back we counted from the car 30 ricebirds, 6 barred doves, 1 Chinese dove, 2 mynah, and 1 plover. These birds were all feeding in the pineapple field. As evident from the bird counts, the birds are most numerous where they are able to find food.

Unoyo Kojima

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CHRISTMAS GREETINGS to all have been received from several of our absent members: T.M. Blackman, Mrs. Ruth Ebert, Dick Kleen, Martha and Don Rosenquist. Cards received also include those from two past presidents -- d'Arcy Northwood and Bob Pyle.

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NEW MEMBERS: We welcome the following new members to the Hawaii Audubon Society: Miss Astrid Jonsson of Honolulu; Mrs. C.O. Buchanan of Wailuku, Maui; Mr. William W. Dunmire of Hawaii National Park, Hawaii; Mr. Waldo Abbott of Santa Barbara, California; Mrs. Edward Aupperle and Miss Gudrun E. Pepke of Los Angeles, California. We are also glad that Dr. Walter A. Kohl of Santa Barbara and Miss Carolyn Crawford of Honolulu have rejoined the Society.

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OKAY, SO THEY'RE THE ONLY ONES I RECOGNIZE

Bird watchers sneer
The more I cheer
    For robin, gull and dove
And humble sparrow.
My range is narrow,
    But them's the ones I love.

Margaret Fishback

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JANUARY ACTIVITIES:

FIELD TRIPS: January 11 - To Manoa Cliffs and Pauoa Flats. Manoa Cliff (3miles) runs along Manoa Cliff to back of Mt. Tantalus. Pauoa Flats (1mile) branches off from the Manoa Cliff trail and runs out to the rim of Pali overlooking Nuuanu Valley Water reservoir. Both trails are usually wet and muddy. If the weather is favorable, we may see Shama thrush, apapane, elepaio, amakihi and even an owl.

January 25 - To Kahuku for shore birds, stopping on our way around the island at Kahana Bay for Gallinule, at Haleiwa to see if the Snow Goose is still there, and possibly to Kaelepulu to look for the Cackling Goose. This is a good year for unusual migrants; it may be an exciting trip.

Meet at the Library of Hawaii at 7:00 a.m. for each trip.

MEETING: January 19 - At the Honolulu Aquarium auditorium at 7:30 p.m. Dr. Miklos Udvardy, exchange professor from the University of British Columbia, will talk on the birds of that area, illustrating his talk with slides.

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