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HAWAII, A CLOSER LOOK

By Jack L. Throp
Director of Honolulu Zoo

The story of Darwin's Finches is well known. No single group of birds has so changed the thinking of man; and consequently made the Galapagos Islands world renowned.

The Hawaiian Islands are better known but for much different reasons. Polynesia, beach and surf, poi and pineapple, mixed well by the Hawaii Visitors Bureau and served in a thousand slick magazines and dreamy posters, have made these islands the most delicious morsels of land in the Pacific.

If the "Beagle" had put into port in the Hawaiian Islands, Darwin would then have discovered an even greater family of birds representing diversified development. The theory of evolution would have been profusely illustrated with references to the family Drepaniidae; and the famed Darwin's Finches, Geospizinae, might have been for kickers.

The Drepaniidae are divided into nine genera with a total of thirty-nine species and sub-species. The original bird to reach the Islands was a nectar-eating, frugivorous species, probably red in color, probably from Central America and probably related to the Tanagers. Because there was no other competition and the "founding family" filled the niche of environment that suited it, members of the family began to expand into the unused areas of food supply, Adaptive Radiation, animal missionaryism.

The drepanides developed bills that fitted all methods of gathering nectar and fruit, then to small seeds, medium seeds, large seeds, and to insects; a family diversity of feeding habits and bill structure that could only be developed in an isolated chain of islands in the center of the Pacific.

This perfect harmony of birds and environment must have felt the impact of the first Polynesian canoe on the sand, the rupture of a biotype that was to grow. The first Hawaiians brought food plants and other flora important to their culture and livestock. Aboard the immigrant canoes were pigs, jungle fowl, dogs, and rats. The animals ran loose to forage about the newly established settlements, and the fertile mouths of valleys and lowlands were cleared for taro, sweet potatoes, and many uncultivated plants. How many species of plants were lost in the eruption of man, how many species of drepanide eroded away is unknown. When Cook discovered the Hawaiian Islands in 1778, they were well populated with the Hawaiian people and still populated with many species of drepanides, but some may well have clung precariously to a shrinking environment even then.

Later immigration of peoples and their introductions of plant and animal life

settled the inevitable for many species, maybe all of them.

The reason for the extinction of some species is quite clear. Remove the habitat and those that depended upon it are also removed. But the reasons for the extinction or marked decrease in numbers of others, or in some, a gradual decrease in numbers are only guessed at, only theorized. All manner of man and beast are accused: the Hawaiians for feather taking, the mongoose and rat for nest robbing, the cattle, the mynah bird, the Zosterop, the mosquito, avian malaria, poultry pox, and parasites.

Man, because each individual must satisfy his curiosity about the other side of the ridge and claim all other animal territories as his own, is the agent for the change, but how to pinpoint which of his children is responsible is not conclusively known. Only ornithological circles are acquainted with the drama of the drepaniidae. Local residents are commonly unaware of the existence of the Honeycreepers let alone the struggle for their existence.

The Honolulu Zoo can make an important contribution to the community and to conservation by an increase of the general understanding of the conditions of change in the Hawaiian Islands. What is needed is a Hawaiian Exhibit illustrating the three basic phases of the Islands' natural history. The first is the Hawaii before man; second, Hawaii of the Polynesians; and third, the Hawaii of later immigrations of peoples, and their cultural heritages.

It is essential in the first phase to exhibit the native fauna and flora, and this includes the story of the drepanides.

The Honolulu Zoo is in the process of learning how to feed the Honeycreepers (Drepaniidae) and to learn under what conditions they must be housed.

This learning started with one 'Apapane (Himatione sanguinea), a maroon red nectar feeder, and two 'Amakihi (Loxops virens), yellow-green birds with black lores and short sickle-shaped bills. Mist nets were used to trap the birds on the island of Kauai in September, 1965. A number of forest birds were caught but only the three Honeycreepers were carried out. The others were banded and released. There seemed enough evidence that Honeycreepers couldn't be kept in the lowlands, so three were enough to use as a test. The inability of the family to adjust to new conditions has been one of the arguments commonly used with the drepanides. The shock of capture, of caging with limited movement, of changed diet, of being transported, of a different elevation and climate, could be too much to bear. None of these was a problem in this experiment. 'Amakihi fed immediately from a nectar vial while being held in the hand, moments after capture, and settled down quietly in a small carrying box. At first there was some quarreling between the two 'Amakihi until a feeder for each was provided. The 'Apapane fed well in the hand but forgot how to use the feeder when placed in a carrying box, though he tried. The bird was re-taught and this time fed successfully on his own.

When finally in Honolulu after being packed out of the mountains, a jeep ride to the airport, and a plane ride to Oahu, the birds were released in pre-constructed flight aviaries. These aviaries were built inside a building that is mosquito proof and isolated from other birds. In three days the 'Apapane was singing and the'Amakihi gave out with cheerful squeeks.

A second trip, this time to the island of Hawaii in November, 1965, brought more birds into the experiment. These were kept in various types of small cages and various methods of feeding were tried. Three weeks after capture when it was felt that one pair of 'Amakihi was well settled in their new captive environment, they were transferred to an outside aviary that gives full protection from other birds but is not mosquito proof.

A first step has been taken in the direction of telling the story of Hawaiian fauna evolution, with living representatives, and of its relation to the present.

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A RECENT RECORD OF THE CRESTED HONEYCREEPER ON MAUI, HAWAII

The Crested Honeycreeper, Palmeria dolei, was last reported by Lawrence Richards and Paul Baldwin (Richards, Lawrence and Paul H. Baldwin, Condor, Vol. 55, No. 4, July-August, 1953, pp. 221-222) as being seen by Richards on December 5, 1950. On this date he saw four and heard five or six others at elevations of 6300-6700 feet on the north slopes of Haleakala Volcano about ½ mile northwest of Pu'u 'Alaea (Red Hill).

Fifteen years have elapsed, and although other persons had made a number of trips to the same general area for the express purpose of observing this species since that time, all their efforts were unsuccessful. Field trips here are frequently hampered by long periods of heavy fog and rains, and clear weather is the exception and not the rule. It is necessary to climb several thousand feet from the crater floor to the rim then descend a similar distance to reach the upper limits of the rain forest which the species inhabits.

On November 16, 1965, James Larson, Joseph Medeiros, Winston Banko, and I went to the Pu'u 'Alaea area specifically to find this bird. The weather was exceptionally clear. About ½ mile northeast of this hill and within the edge of the rain forest just above the fog at an elevation of about 6500 feet, Larson, Medeiros, and I saw two birds of this species alight side by side in a small 'olapa tree about 60 feet away. After about 15 seconds, they dropped down into the tree out of sight, but not before affording us excellent views in good sunlight. The bird I observed had a distinct golden crest. Larson, viewing the other bird, stated that the crest on that individual was gray. Banko was 100 feet below us and had one bird approach to within 20-25 feet of him. After examining him curiously, it flew off. Actual field observation time was only 1 hour, because the balance of the day was spent hiking to and from the area where the birds were observed.

A check of the skins of this species in the Bishop Museum collection in Honolulu revealed that the crests of most of the birds were of a golden coloration rather than gray. (Eugene Kridler, U.S. Bureau of Sport Fisheries and Wildlife, 835 Akumu Street, Kailua, Hawaii 96734)

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WATERBIRD OBSERVATIONS AT KANAHA AND KEALIA PONDS, MAUI, 1965

During the course of other duties while on Maui, complete waterbird censuses were conducted at Kanaha and Kealia Ponds on Maui. The October count was made by me, and those in November by Mr. Winston Banko, also of the Bureau of Sport Fisheries and Wildlife, and me. The observations were made through 10x binoculars and a 25x spotting scope in excellent light. Species listed are in A.O.U. order.

Species	Kanaha 10/28	Kealia 11/1	Kanaha 11/18	Kealia 11/18
Black Tern	.	.	2	.
American Widgeon	.	.	2	.
Shoveler	289	.	247	.
Pintail	58	.	231	.
Canvasback	.	.	1	.
Bufflehead	.	.	1	.
Black Brant	1	.	1	.
Black-crowned Night Heron	16	2	7	9
Coot	36	8	31	19
Black-necked Stilt	211	58	171	22
Dowitcher	3	.	.	.
Pectoral Sandpiper	1	.	.	.
Semipalmated Sandpiper	1	.	.	.
Sharp-tailed Sandpiper	9	.	.	.

Species	Kanaha 10/28	Kealia 11/1	Kanaha 11/18	Kealia 11/18
Sanderling	16	46	5	.
Bar-tailed Godwit	1	.	.	.
Golden Plover	54	122	51	8
Semipalmated Plover	2	.	.	.
Ruddy Turnstone	14	30	3	41
Wandering Tattler	1	1	1	1
Short-eared Owl	.	1	.	.

The most sharp-tailed sandpipers counted were 10 on October 26 although 2 were noted on October 25. Also observed on the October 25 date were 2 semipalmated plovers, 1 semipalmated sandpiper, and the bar-tailed godwit. The godwit was never seen again after that date. Several golden plovers kept harassing this bird by flying above it then swooping down and making passes at its head. The larger bird would run off a bit then resume feeding only to be molested again. The black brant, an adult, was first seen on October 27. Whether this is the same bird that spent most of the past winter at Kanaha or was a different individual is open to speculation.

The pectoral sandpiper was first observed on October 27, but it and all the other species of shore birds were observed at Kanaha at various times throughout the week up to and including October 29.

The area was subject to heavy rains prior to the November count, and as a result water levels in the ponds were much higher and many of the mud flats covered. Kealia was full, and water extended into the sesuvium bordering its shores. None of the more unusual shore birds commented upon were to be found on Kanaha. Either they had scattered to other areas on the island or moved on a normal migration dictated by time and not habitat conditions.

The two black terns were in winter plumage, and they were first seen resting on a small island about 40 yards from the small lookout on the point. As far as we can determine, this is the first record for Maui for this species. The first State record was that obtained by W. Michael Ord and his group which saw one individual four days earlier at Waipio Peninsula on Oahu.

The canvasback was a male in full winter plumage. The bufflehead appeared to be an immature male, because the white patch behind the eye was much larger than that present in most females, even adults. (Eugene Kridler, U.S. Bureau of Sport Fisheries and Wildlife, 835 Akumu Street, Kailua, Hawaii 96734)

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IN PURSUIT OF HILL MYNAHS

By Walt Donaghho

Al MacDonald, forester, notified me one day that he had seen Hill Mynahs at the Forestry Nursery, 3 on Jan. 26, and 7 on Feb. 3rd. "They come down from the direction of Tantalus in the early morning," he said, "and hang around the nursery for an hour or two, then fly over to the Brassaias on the Ewa side of Makiki Valley, where they feed on the berries. Then they work their way up the slope towards the Eucalyptus forest on the summit, and towards the top of Tantalus."

At that time, I had had only reports of mynahs being seen on Tantalus; I had never seen any myself, although I was on the alert for them. The only mynahs I had seen previously were eight in Lyon Arboretum last November. So, on the morning of Feb. 11th, I cycled up the Nursery road and parked in the parking area by the office. Loud whistles assailed my ears as I switched off the engine, coming from a large Jhalna tree at the edge of the forest, overlooking the seedling beds. I walked down into the seedling area, glancing up into the tree and soon picked out their glossy, jet black forms, with the bright orange bills and facial masks. One finally flew out of the tree and crossed the valley to land in the Brassaias up

the slope. Then it returned, and soon after, all three flew out, circled higher and higher over the nursery, mounted the ridge on the Waikiki side, and flew up towards Tantalus. I followed the trail up the ridge to the top, hoping to hear them somewhere in the valley on the other side, but nothing greeted my ears there, except the cooing of both doves, the whistles of cardinals, and the song of a Shama thrush from the valley bottom.

Returning to the parking area, I drove out of the nursery, down, and up Roundtop Drive, bent on tracking them down. Climbing up Roundtop and to Sugarloaf, I parked at the entrance of the Trans-Makiki Valley trail and hiked along it, listening hard to catch their loud whistles. Shamas and Leiothrix were singing, but no mynahs called. Then I drove on, up to the Brash residence, where I went in listening for their calls. They had been heard about here in the past, but they weren't there today. Driving on, I turned into the driveway of the Griffing residence and drove up. This is the last place where they had been seen regularly in the past. Don Angus, house-sitting for Griffing while he was away, met me as I drove up and said that he had been hearing strange birds recently. He suggested our walking down the driveway again, for he said that he frequently heard them within the grove of palms growing on the hillside above the driveway. As we started out, I suddenly saw a large black bird fly across the road flashing white patches on its wings. It disappeared in the direction of the palm groves. "That was a mynah!" I told him.

"Oh, really?" Angus replied. "I have been seeing them here frequently."

We walked down the driveway, and immediately, I heard the loud "Cheeew!" of a mynah, high above us. It wasn't long before we spotted one high in one of the two tall Norfolk pines growing by the side of the road. Others were heard among the palms on the hillside on the other side of the road.

We returned to the house again, and followed the trail that led down the hillside underneath the palms to the bluff overlooking the driveway. Rounding the turn and doubling back towards the driveway, I saw a black shape that had the orange legs, bill, and facial mask of the mynah fly into a palm. It was beautiful, in contrast to the green of the palm. It flew out again, and up into the large ahuehuete, or Mexican cypress that dominates the hillside, and was joined by one, two, four, then five others; six in all.

There are problems that immediately come to mind concerning these birds. Are these the same birds that visit the Nursery? Or are they those reported by Margaret Titcomb near her residence in the Eucalyptus forest? Do thy also go down to the Lyon Arboretum? Twelve birds have been seen at the Arboretum. Is that the total number on Oahu?

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Field Notes: FINCHES

February 17, 1966: Saw a pair of Saffron Finches, and a pair of Grey Singing Finches feeding on the grass of the lawn of the center strip of Kalakaua Avenue in Kapiolani Park, just Ewa of the fountain within the traffic circle at the Diamond Head end of the Park. They were a beautiful yellow-green above, lemon yellow below, and had generous splashes of orange on the head. These Saffron Finches were reported to me by Ray Kramer, who saw them exactly in the same spot two or three days previously.

Walt Donaghho

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Field Notes: SHAMA THRUSH

Priscilla Harpham reports that a Shama Thrush has been seen and heard on the grounds and among the buildings at St. Francis Convent School on Pamoa road for five consecutive days at this writing (3/1). It had been heard but not identified for a day or so prior to the first sighting. It was seen first on the lanai, then perched on the statue, appropriately enough, of St. Francis in the school grounds, and later in the Brassaia tree at the entrance to the grounds where it remained, singing lustily, while a small crowd gathered to watch and listen. This individual seems not at all shy

when passersby stop, and returns to the general campus area daily.

Earlier in the year several Shama have been heard in the trees nearer Manoa stream at the back of this campus.

Is it possible that the bad weather of the last several days has brought this individual to the vicinity of the buildings and gardens for better food or shelter?

Is this not a rather unusual sighting for as low a situation as this area?

Charlotta Hoskins

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Field Notes: BLACK-WINGED PETREL

Dr. Charles A. Ely brought a Black-winged Petrel, subspecies of the Bonin Island Petrel, to the Audubon meeting on November 15, 1965. (See THE ELEPAIO, Vol. 26, No.9, Mar.,1966, p.84) According to Dr. Ely, this bird landed on the Townsend Cromwell, one of the Bureau of Commercial Fisheries research ships, on November 12, about 60 miles west of Hawaii. Its habitat is around Kermadec Islands, New Zealand. The differences between these two birds are as follows: The Bonin Island Petrel, from the Leeward and Bonin Islands, has the nape darker than the back which is a dark gray in color. The Black-winged Petrel has the nape concolor with the light gray back. The general appearance is of a light gray head and back with the Black-winged Petrel and a much darker head and back in the Bonin Island Petrel. Both have a broad black border to the underwing.

Unoyo Kojima

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READERS' NOTES

THE WEST AUSTRALIAN (PERTH), Sept. 8, 1965, page 4: Naturalists Defend the N.G. Birds of Paradise by E.A. Barker (Alphonse Labrecque's contribution)

Moves to legalise the hunting of birds of paradise in Papua and New Gunea have ruffled the feathers of hundreds of birdlovers in the Territory and overseas....

A bill...which would have permitted birds of paradise to be hunted in open season, was defeated on its second reading in the House of Assembly....The bill stemmed from an appeal by natives in the Gulf district who want the plumes for income because of the lack of natural resources in the area.

Those who supported the measure said that the...human needs should take precedence over whims to protect the territory's flora and fauna....They argued that... killing could be controlled by limiting the number of plumes to be exported at any one time and by declaring some natural haunts--in districts rich in other resources--sanctuaries.

The administration opposed the bill....Philanthropist Sir Edward Hallstrom, founder of the Nondugl bird sanctuary in the western highlands, was a principal figure in the forces opposing the measure....

One of the most outspoken critics is aviculturist Vincent Hesse. He claimed that two Sydney agents...stood to make a fortune if the bill was approved. They would pay the natives a pittance for guiding them to the birds' dancing trees.

Mr. Hesse predicted that birds of paradise would be extinct in 20 years if legalised killing was approved. The rarer varieties would be wiped out in ten years.

"Natives have been killing the birds with bows and arrows for hundreds of years for personal decoration and I have no quarrel with this," he said. "The number they take is negligible."...."Before the great War, about 20,000 birds a year were exported to Paris fashion houses. They saw the red light then and brought in a ban."

Open shooting had wiped out millions of passenger pigeons in the United States.... A ban had been imposed too late to save the species. The same thing could happen in the territory.

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TESTS PROVE SOME BIRDS CAN SMELL by Harry Nelson--Los Angeles Times (Ethel Matheson's contribution)

The argument that has raged for 2300 years between naturalists who believe birds can smell and those who don't has finally been resolved--both are right.

Some birds, notably the Australian kiwi, the turkey vulture and certain seabirds can detect odors with great precision, according to experiments by researchers at the Medical School of the University of California at Los Angeles and the Los Angeles County Museum.

Other birds, like canaries, parrots, parakeets and sparrows probably would starve to death if they had to depend on their olfactory sense, said Dr. Bernice Wenzel, associate professor of physiology at UCLA....

About five years ago, Dr. Kenneth E. Stager, Senior Curator of Ornithology at the Museum, met a retired oil worker who told him that in 1938 serious leaks in a line prompted his company to inject the chemical ethyl mercaptan into the line so that leaks could be detected by smell by men walking along the pipeline.

It was soon discovered that turkey vultures, apparently attracted by the smell, collected wherever the line was leaking.

This prompted Stager to begin his own controlled experiments wafting vulture-appealing odors into ascending air currents. Turkey vultures came in droves.

Dr. Wenzel has done similar experiments with parrots, sparrows and shearwaters.... In some species she has measured significant changes in heart rate, respiration and the electrical activity of the olfactory bulb--that part of the brain that controls smell--when the birds are exposed to appealing smells. In other species, the reaction is negligible.

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LETTERS: From Dr. Robert H. Cooper, Muncie, Indiana, February 18, 1966:

"...Mrs. Cooper and I flew commercially to Corpus Christi and rented a U-Drive car during the Christmas vacation and spent our time at the Rockport Cabins next door to Connie Hagar whom I'm sure you know by the article in the National Audubon magazine last fall. (Jul-Aug, 1965, p. 222-228) We were privileged to help make the Aransas National Wildlife Refuge bird census on December 22, and...we got a total of 113 species and approximately 9,205 individuals. This was quite a treat for Mrs. Cooper and myself, since we have never seen the whooping cranes. We were able to see 31 out of the 44 that returned to the refuge to spend the winter months....

"This is a wonderful experience for us and we were able to add some species to our life list. Our greatest personal thrill probably came from Mrs. Cooper's and my finding the Vermillion flycatcher and being able to take a kodachrome telescopic photo of it....

"We have had dozens of tree sparrows in our gardens at our home in the country. They especially feed on the seeds of the pigweed and the lambsquarter. There were a few around this morning even though the weather is showing many indications of spring. We have had meadow larks around our house all winter even with the snows. We have some acreage that we have left in brome grass for six years. It is high enough that they can come in of evenings and settle down under arched tall grass. The eastern meadow larks have been singing their spring song for the last two days...."

The following interesting clipping was enclosed: FREEZE DESTROYS NESTLING STORKS, Fort Myers, Florida (AP) Nestling wood storks in an estimated 4,000 nests were killed in the Sunday night (january 30, 1966) freeze in Corkscrew Swamp, an Audubon Society official reported Friday.

Dr. Alex Sprunt said that the sounds of young birds would be heard everywhere a day before the cold hit, but virtually none could be found on the day after. Hatching started in the nests about January 15; the 38-degree cold hit two weeks later.

The WOOD STORK is the only member of the stork family native to the Western Hemisphere and Sprunt said there have been predictions it might become extinct within 10 years.

Sprunt said that there was no hope that the birds whose young perished would try to raise another family this year. Those whose eggs had not hatched might try, he added.

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February Field Trip:

Eleven members and seven visitors hiked the Palikea trail last February 13. The trail was wet and windy. Birds were numerous although we didn't see as many as expected. Most numerous, of course, were the white-eye, house finch, and the leiothrix. 'Apapane and 'elepaio were frequently seen and heard calling in the 'ohi'a trees. We neither saw nor heard the Chinese thrush,but several bush warblers were singing enthusiastically, and some hikers managed a close look at this usually evasive bird. 'Amakihi were seen, although only at some distance. Though this hike is one of the most difficult, hikers generally agree the sights and sounds are well worth the effort.

Sheila Conant

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FOR JUNIOR MEMBERS:

FIRST BIRD WALK
(Along the Palikea Trail)
By Jerriane Sakoda*

There was a lovely view from the trail down to the huge, white boulders and forest below. I heard the calls of birds all around--not of mynah or dove, but comely 'apapane and 'elepaio, 'amakihi, and unseen, the bush warbler. Unoyo Kojima, whom I was with most of the time, called to the birds hovering above lehua blossoms or perched in bushes and trees. I strained to see them as she pointed them out. I had no trouble seeing one 'elepaio, though, that came closer and closer to us until it was only two feet away. I enjoyed trying to identify the birds by their calls--a confusing thing for a tyro to do!

About an hour before midday a light mist began wafting toward the mountains from the sea. The birds seemed unaffected by it but we started back, for it seemed about to rain, and we had reached the end of the trail.

Perusing BIRDS OF HAWAII after the trip was much more interesting than before, because I was acquainted with more of the birds mentioned. I've also been noticing more birds lately, including a cardinal and half a dozen Brazilian cardinals where I live, and a plover at Hauula Beach Park.

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*Jerriane is a Sophomore at Kalani, and despite her busy schedule she has contributed this article. MAHALO NUI LOA.

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This month we'll study eggs. They come in all sizes and color, and they contain everything necessary to develop into birds exactly like their parents. Nature provides for the survival of the species, so the eggs are colored according to that need. Birds nesting in dark holes lay immaculately white eggs, but those nesting in open areas lay speckled, spotted, well camouflaged eggs.

What determines the shape of an egg? The answer is again--survival! Most eggs are more pointed at one end than the other. According to Robert S. Lemmon in ALL ABOUT BIRDS, page 107, "The pointed end is the one that comes out of the mother bird first. There are several reasons for its shape. One is that it makes the egg easier to lay. Another is that such a pointed end is stronger than a more rounded one. So there is less chance that the shell will break if the egg happens to land on a hard surface when it is laid. And for a third reason, pointed eggs are less likely to roll out of a shallow nest or off a rock ledge which some sea-birds choose for their nests. If you want to see what happens to an egg on a flat surface, try this experiment. Roll a hen's egg and a small round ball gently along a bare floor or the level top of a table, and note the different course they take. The ball will roll away in a straight line, but the pointed egg will either wobble or circle back toward its starting place."

Roger Tory Peterson in THE BIRDS of the Life Nature Library, on page 142 says, "The laying of the eggs is synchronized with the building of the nest and may start the day after the last stick or straw has been pushed into place. Some birds take

a breather for several days before beginning to lay. In most of the perching birds the usual rate is one egg a day, laid in the early morning....

"The number of eggs a bird lays might be taken as an index to its life expectancy. By inference, hummingbirds, laying only two eggs, have fewer hazards or greater longevity than wrens which rear two broods of six or seven in a single summer. An albatross or a petrel lays but a single egg and if it is lost will not lay another that year. On the other hand, a pheasant or a duck may lay 12 or even 15 in a single clutch....

"Some birds are 'determinate' layers. A typical sandpiper or plover lays four eggs, no more, and if one is taken it does not make up the loss, it always lays four, then stops. 'Indeterminate' layers will keep on if their eggs are taken. They apparently must feel the proper number in the nest before they stop. Domestic fowl fall into this category....

"Most perching birds and precocial birds do not start incubation until the clutch is about complete. This gives all the young, which hatch fairly close together, an equal start in life. Hawks, owls, parrots, herons, storks and a number of other large birds, however, incubates from the day the first egg is laid, with the result that the youngsters hatch at intervals....

"Merely sitting on the eggs does not insure their incubation. Feathers are insulation; to transmit heat to the eggs birds develop "brood spots," bare patches on the underbody....Settling on the eggs, the bird parts its abdominal feathers and shimmies its body so that these spots come into comfortable contact with the eggs. In general these patches, numbering from one to three in different species, are present only in the sex that broods....But not all birds have this thermostatic incubation aid. Ducks do not, but they compensate by pulling out the down themselves and adding it to the nest. Gannets do not have them either; they place a big webbed foot on the single egg, like a warming pad....Incubation may take as little as 11 days in some perching birds, but as long as 80 days in kiwis and large albatrosses."

If you ever find a nest with brooding bird, be careful not to disturb the bird, but take copious notes and tell us about your findings.

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Are you watching the plover? What changes do you find in its appearance and behavior? These are my observations:

February 15: I detected the first black feather on a plover--just a tiny black spot on the breast.

March 4: I am beginning to count the white spots. The breast feathers are changing to black very fast on some birds, whereas on others there's not a single black spot.

Write to me about your observations.

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Here's another project I want to share with you. Last month we learned that one of the aims of this group was to arouse public appreciation of the beauty and economic value of wild life, and to stimulate action to preserve and protect it.

Let us take immediate action in arousing public appreciation of the beauty around us by first getting rid of litter. We can do this by not being litterbugs. Enlist your friends to help you with this project. At the same time, point out to your friends the beautiful blossoms of the shower trees, unusual cloud formations, glorious sunset, the symphony of doves cooing, cardinals singing and above all, become aware of the existing conditions.

If you have any suggestions or interesting experiences in conservation or beautification of your community, please write to Kojima, 725-A 8th Ave,Honolulu 96816.

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WHY BAND MIGRATORY BIRDS? from PACIFIC BIRD OBSERVER, September, 1965, No. 1:

In his ancient migrations throughout the Pacific, man found the birds his allies, and soon turned their ways to his advantage. Primitive voyagers learned to recognize the flight habits of certain birds far at sea and thus knew that land lay

not far ahead. Many of the Pacific's islands were discovered in this way. Fishermen, too, for untold ages, have carefully observed the flight patterns of birds in their own search for fish. On land, many settlers have survived upon birds and their eggs when no other food was available.

Today as in the past, birds are extremely important to life in the Pacific. The commerce in guano, a valuable agricultural fertilizer, stems from vast accumulations of excrement over long periods on "guano islands" where it is deposited by great numbers of seabirds. And, although man no longer depends heavily on birds for food and navigation, flocks of feeding seabirds still clue Pacific fishermen to schools of food fish.

In studies conducted by the U.S. Fish and Wildlife Service on the relation of bird flocks to fish schools in the Central Pacific, it was found that about 85 percent of all fish schools sighted was accompanied by feeding bird flocks and was located by first sighting the birds. Not only that, but fishermen were often able accurately to identify the species of fish by the characteristic action of the bird flock! A significant part of today's multi-million dollar tuna industry in the Pacific owes its existence to birds and their value as fish-school indicators.

Wild birds are of great value to man in the Pacific for all of these reasons, and like anything of great value should be respected and conserved. Used wisely, they will remain an aid to man for unlimited years to come.

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How Smithsonian Bands Pacific Seabirds and What to Do if You Find a Band will be published in the next issue of THE ELEPAIO.

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Those who wish to cooperate with the Smithsonian study, write to Pacific Ocean Biological Survey Program, Smithsonian Institution, Washington, D.C. 20560 and ask to be placed on their free mailing list to receive the PACIFIC BIRD OBSERVER.

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ALOHA to our new members:

Winston E. Banko, 3262 Paty Drive, Honolulu, Hawaii 96822.
Dr. & Mrs. John W. Cooper, Room 353 Alexander Young Bldg, Honolulu, Hawaii 96813.
Alex MacGregor, P.O. Box 8052, Honolulu, Hawaii 96815.

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APRIL ACTIVITIES:

April 10 - Field trip to Ulupau Head to study the boobies. Bring lunch, water, and if possible, your car. Transportation cost (75¢) to be paid to the drivers. Meet at the Library of Hawaii at 8:00 a.m. Leader: Mike Ord, telephone: 256-320

April 11 - Board meeting at the Honolulu Aquarium Auditorium at 7:30 p.m. Members are always welcome.

April 18 - General meeting at the Honolulu Aquarium Auditorium at 7:30 p.m. Program for the night: Ray Kramer, Non-game Bird Biologist, Division of Fish and Game, will talk on "State of Hawaii's Non-game Bird Program."