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For the Better Protection of Wildlife in Hawaii

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PROBLEMS FOR HAWAIIAN BIRD STUDENTS By Andrew J. Berger

The newcomer is perhaps more likely to be aware of problems than is the person who has grown up in a particular region and is, therefore, more inclined to take the total environment for granted. I remember clearly my own bewilderment when faced with the Hawaiian names for birds when I came to Honolulu for the first time in February of 1964. What, indeed, was the correct pronounciation for such names as Puep, 'I'iwi, 'Apapane, and 'Amakihi? Although I had studied birds of the world for a number of years, I had never had any reason to make a special study of Hawaiian birds, and I realized quickly how woefully ignorant I was about them.

I did know that the Hawaiian Honeycreepers, which ornithologists had placed in a family called the Drepaniidae (also sometimes spelled Drepanididae), belonged to an endemic family. That is to say that the birds in this family are found on the Hawaiian Islands and no place else in the world. Also implicit in the use of the term "endemic", as applied to the Hawaiian Honeycreepers, is the corollary that no bird anywhere else in the world belongs in this family, because none of these other birds have the same characteristics as the honeycreepers. Furthermore, it is taken for granted that all of the members of a given bird family are derived from a single ancestor which lived in the remote past. Technically, we say that a family is <u>monophyletic</u>, which is simply a shorter way of saying that all of the living members were derived by evolutionary processes from a single ancient ancestor.

Inasmuch as taxonomists have placed certain Hawaiian birds in this family Drepaniidae, it is assumed that all were, indeed, derived from a single ancestor, which reached the Hawaiian Islands thousands of years ago. Please note that this is an "assumption" only. There is no proof. Also bear in mind, when confronted with classifications of birds, that <u>only the individual kinds of birds or species</u> <u>exist in nature</u>. All of the higher categories in the taxonomic hierarchy (e.g., genus, subfamily, family) are man-made groupings; they exist on paper only. These taxonomic groups, however, are based on the best evidence available to the taxonomist at the time of his study. As new evidence is obtained, changes may be made in the taxonomic system in order to reflect true phylogenetic relationships more accurately.

One of my keen interests is the breeding biology of birds. As I became familiar with the literature on Hawaiian birds in 1964, I was amazed to learn how little was known about the nesting habits of either the native or the introduced species. There appeared, in fact, to be no accurate information on the total length of the breeding season for any Hawaiian bird.

Hence, data are needed on both the native birds and on the numerous introduced species. This paper, therefore, is written to point up the type of information that is needed, much of which can be obtained even by residents who live in metropolitan Honolulu. Most of the seabirds are excluded from the discussion because the offshore islands are, for the most part, wildlife refuges, and special permission is required to visit them. Following are examples of the kinds of information that we need.

<u>Manx (Newell's)</u> <u>Shearwater and Harcourt's Storm</u> <u>Petrel</u>. Do these birds nest in the cliffs of Kauai (or the other main islands)? If so, where and when?

<u>Dark-rumped Petrel</u>. Does this species nest only at Haleakala on Maui? Do any of the seabirds nest on Mauna Loa and Mauna Kea?

<u>Hawaiian</u> (<u>Black-necked</u>) <u>Stilt</u>, <u>Common Gallinule</u>, <u>and American Coot</u>. What is the breeding season of these birds? Where are the breeding greas? What is the clutch size (the number of eggs laid for a single nesting)? Munro (<u>Birds of Hawaii</u>, page 60) said that there are from 8 to 12 eggs in the clutch of the Hawaiian Stilt. This obviously is wrong. Neither I nor W.M. Ord have ever found a stilt nest containing more than four eggs.

The <u>incubation period</u> is the time interval between the laying of the last egg in a clutch and the time that the egg hatches when all of the eggs in the clutch do hatch. The incubation period for one clutch of four Hawaiian Stilt eggs in 1964 was determined by Berger to be 24 days. So far as I know, there is no other statement in the literature on the precise incubation period for the Hawaiian races of the stilt, the gallinule, or the coot.

<u>The Introduced Species</u>. The introduced species in Hawaii come from both Americas and from several parts of Asia. Many interesting studies remain to be conducted. For example, is the nesting season of the Mockingbird, the Western Meadowlark, and the American Cardinal the same in Hawaii as it is on the Mainland? Is there any difference in clutch size between the Mainland birds and the Hawaiian birds? The opportunity also exists to obtain previously unrecorded information on the life history of many Asian species, most of which have never been studied thoroughly in their native habitat.

We do not have accurate, detailed information on the distribution of most of the introduced birds, even on Oahu. We lack the most elemental information on the breeding biology of all introduced species. The following questions suggest <u>some</u> of the basic aspects of the life history of a bird:

1. Do the birds defend a territory? If so, do they defend it throughout the year or only during the breeding season?

2. Do both the male and the female help in building the nest? If not, which sex constructs the nest?

3. What is the average number of eggs in a clutch? What are the extremes of clutch size in nests that contain a complete clutch? Does clutch size vary with time of year?

4. Which sex incubates the eggs? The female? The male? or both?

5. What is the incubation rhythm? That is, how much time does the incubating bird spend on the nest and how much time off of the nest during the incubation period? If both sexes incubate, which sex spends the night on the nest?

6. What is the length of the incubation period? Do all of the eggs hatch on the same day?

7. How soon after hatching are the young birds fed? How often are they fed? By the male? By the female? Does the number of feedings per day change as the nestlings grow older? Do the adults eat the fecal sacs voided by the young birds, or do they carry them away?

8. How long (that is, for how many days) after hatching are the young brooded by the adults during the daytime? at night?

9. What is the length of the nestling period? A bird is a <u>nestling</u> from the time it breaks out of the egg until it leaves the nest; after that, the young bird is called a <u>fledgling</u>. Do all of the young leave the nest at the same age? Can the young fly when they leave the nest?

10. How long is the fledgling fed by the adults? At what age does the fledgling begin to pick up some of its own food? When is it completely independent of the adults?

11. Where do the recently-fledged young birds roost at night? Where do the adults roost (both during and after the breeding season)?

12. Do the introduced species of birds raise one brood of young per year or more than one brood? In order to learn the answer to this question, the adults must be color-banded so that the identity of each bird is known positively. What is the over-all length of the breeding season for each species of introduced bird?

<u>Native Land Birds</u>. Answers to the questions listed above also are needed for the Hawaiian Crow, the thrushes, the 'Elepaio, the 'O'o, and the honeycreepers, as well as for the Black-crowned Night Heron ('Auku'u), the Hawaiian Hawk ('Io), and the Short-eared Owl (Pueo). The present distribution and abundance of these species also is in need of thorough study.

Reliable (="scientific") information on these items cannot be stored in ones head, however. Our memories simply are not reliable when it comes to recalling times, dates, or even precise localities. It follows, therefore, that an essential step in collecting worthwhile information is to record it in writing immediately, or as soon as possible after the observation is made. Needless to say, one must be positive of his identifications. If uncertain about the identity of the bird that built a particular nest, for example, call someone who can verify the bird's identity, but do so when the nest is first found and is active. An empty nest tells us very little, especially about our unanswered questions.

In addition to pointing out how much we need to learn about all of the birds in Hawaii, I also make a plea for an end of check-lists and review papers which are based solely, or primarily, on the earlier literature, but which contain the implication that they reflect the distribution and abundance of Hawaiian birds now, in 1966. By "earlier literature", I mean Munro's <u>Birds of Hawaii</u> and all references prior to the publication of that book in 1944. It is not a criticism of the late George C. Munro to state that his book now is of historical interest only. His book is, in fact, of the utmost importance when dealing with the historical aspects of Hawaiian ornithology. No one can read his book thoroughly without appreciating that, by and large, it discusses the Hawaiian avifauna as it existed in the 1890's and early 1900's.

I make a further plea for an end to the oft repeated uncritical quotations from the early literature, and the perpetuation of concepts and statements which are misleading or erroneous, or which are completely unfounded in fact. It is even worse to misquote an early author by stating as a fact something which that author merely said "might be so". Let it be emphasized that no one <u>knows</u> that the ancestors of the Hawaiian Honeycreepers, for example, came from Central or South America. No one <u>knows</u> that <u>any</u> Hawaiian bird became extinct because of introduced diseases, even though this may appear to be a "logical" conclusion. If, for example, introduced diseases were responsible for the extinction of so many of the native birds, how did the "Apapane, 'I'iwi, 'Amakihi, and Palila manage to thrive? Except possibly for the extinct species of Laysan Island, there undoubtedly was no single cause for the extinction of so many of the Hawaiian birds.

It may be argued that <u>The Elepaio</u> is not a "scientific" journal. Nevertheless, its readers in Hawaii and on the Mainland should not be subjected to frequently repeated but completely unfounded statements. What we need are present day facts about Hawaiian birds. There is ample work to be done. Forget the guesses. Collect the facts. And, good birding!

Editor's Note: Here is a challenge! We need everyone's help not only to watch but also to record the observations. The nesting season is just around the corner, so please send in your field notes. If you encounter any difficulty, tell us. Other members may have the solution to the problem. Let's make 1967 a busy but exciting worthwhile birding year. If you have any suggestions, please write to Kojima, 725-A 8th Avenue, Honolulu, Hawaii 96816.

FIELD NOTES from Robert L. Pyle, NOTE FOR THE ELEPAIO*

On October 29, 1966, a survey of the pelagic birds occurring in the offshore waters southwest of Oahu was made. The area surveyed was approximately ten miles southwest of Barber's Point. Wedge-tailed Shearwaters were common, with single birds being sighted every fifteen minutes on the trip to and from the survey area. Two Common Noddies and one Kermadec Petrel were noted in the survey area proper, as was a flock of fifteen Wedge-tailed Shearwaters and three Pomarine Jaegers found feeding over a pod of eight to ten Pilot Whales. On the return from the survey area nine Brown Boobies were noted on three offshore buoys. One Arctic Tern was observed feeding in the shallow waters inside the reef just off Ahua Point in Keehi Lagoon. Shorebirds were concentrated on the mud flats in Keehi Lagoon. Sanderlings, Ruddy Turnstones, Golden Plovers, and Black-necked Stilts were abundant, and two Black-bellied Plovers were alos noted there.

On October 30 a trip was made about 15 miles due south of the Kalihi Entrance to Keehi Lagoon. Wedge-tailed Shearwaters were as common as on the twenty-ninth. Seven Pomarine Jaegers and one Dark-rumped Petrel were also observed.

On October 31 a second trip was made due south of Kalihi Entrance. Ten Redfooted Boobies, 14 Brown Boobies, and 9 Pomarine Jaegers were observed on this trip. One Leach's Storm Petrel was noted under the bridge to Sand Island.

*Paper Number 27, Pacific Ocean Biological Survey Program, Smithsonian Institution, Washington, D.C. 20560. By Lawrence N. Huber and Richard S. Heiden.

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From Jack L. Throp, Director, Honolulu Zoo, January 20, 1967: White-rumped Storm Petrels

On January 5 a Hawaiian Storm Petrel was found on the beach at Hauula. The bird was struggling, unable to get airborne, when Mrs. Clara Saganu discovered it late in the evening. Next morning she brought the bird to us at the Honolulu Zoo.

The Petrel was force fed small pieces of smelt that had been dipped in water and liquid vitamins. Petrels and Shearwaters will not normally take food voluntarily in captivity. Annually, we receive one or two Bulwer's Petrels and many Wedgetailed Shearwaters that become land locked. We force feed them for a few days to build their strength and endurance; then they are released from an altitude along Diamond Head Drive.

There are two species of White-rumped Storm Petrels that occur in the Hawaiian Islands--Harcourt's (Oceanodroma castro) and Leach's (Oceanodroma leucorhoa). The former is thought to be a breeder on Kauai, the latter, a visitor. Storm Petrels of either species are rarely found on Oahu so there was considerable interest in identifying and, if it should die, in preserving this specimen. It did die on the third day after rescue. Dr. Robert Pyle identified this bird as a Leach's Storm Petrel, a male, probably immature, certainly not in breeding condition (gonads $1 \times 0.5 \text{ mm}$). The cause of death was probably starvation. Dr. Pyle has given the specimen to the Bishop Museum collection; the accession number is 7559.

READERS' NOTES:

HONOLULU ADVERTISER, December 29, 1966, BOTULISM KILLING DUCKS ON KAUAI by Sean O'Neal (Ruth R. Rockafellow's and Margaret L. Smith's contributions)

Death of over a hundred migrating ducks on Kauai has prompted the State's Department of Land and Natural Resources to mount an air-borne hunting expedition.

The stricken ducks were all found in a sediment reservoir above Lihue by biologist Gerald Swedberg of the Division of Fish and Game.

Those that were not already dead were too weak to move and many of them were drowning. Because of the soft mud in the basin, Swedberg was unable to get to the

live birds to examine them.

The biologist suspected the birds were dying from botulism, a poisoning resulting from the growth of bacillus in the pond.

Swedberg's department flew in an anti-toxin from Oregon, and if the diagnosis were correct, it would save the surviving ducks from the botulism.

But after sinking to his shoulder in the soft mud, Swedberg was unable to catch a live duck and try the serum. He finally enlisted the aid of Jack Harter, head of Garden Island Helicopters, to catch one from the air. Harter and Swedberg built a narrow wooden platform on the helicopter's skids, took the doors off the aircraft, and, equipped with a long-handled net, went on their unorthodox hunting trip.

The reservoir was littered with the bodies of over 100 dead pintail and Hawaiian ducks, poisoned after flying 3,000 to 5,000 miles from Canada.

While Harter hovered just inches above the water, Swedberg climbed out on the precarious platform and searched for live specimens. After nearly 20 minutes, they finally found a live Hawaiian duck, known locally as a koloa, hiding in the grass near shore. Swedberg scooped the duck into the net, climbed back into the helicopter and sped back to inject the dying bird with the Mainland serum.

"We should know in a few days whether the cure will work," he said, "If so, we can save the others."

He explained that the suspected botulism was from a natural growth in the pond, not caused by anything being dumped in. "But it can kill them the same way it can kill humans when they contact it through food."

Further information from Gerald Swedberg:

From December 15, 1966 (when the outbreak became known to me) to January 23, 1967 we lost a total <u>33 koloa</u> that could be positively identified. Of these, 31 were at the Lihue Plantation settling basin, and two were found near Kilauea some 12 miles away.

In addition, we lost <u>17</u> unidentified ducks that were either koloa or hen pintails, at the Lihue Plantation settling basin.

We also lost <u>64</u> positively identified pintails, <u>1</u> shoveller, and <u>3</u> gallinules.

I have also received unverified reports that we have lost ducks at a small marsh near the Kapaa Cannery, some 6-8 miles away, and a Kipu ranch some 4 miles away. I am attempting to check this out now.

Rick Fuller checked the area thoroughly on January 25 and January 27 and found no new dead or sick birds. I checked it on January 30 with the same results.

On January 25 Fuller counted 1 stilt, 4 pintails, 9 koloa, 3 gallinule, 2 coot. On January 27 Fuller counted ----- 2 " 8 " 5 " 3 " On January 30 Swedberg counted ------ 11 " -----

On January 30 Swedberg counted ----- 11 " -----All of which is of questionable worth so far as drawing conclusions, but at least they aren't dying like flies at the basin. I will do my best to check out these other leads and see if I can get that water level up.

As you can see from the aforementioned data, we have lost a considerable number of birds. We are most concerned about the Koloa, of course, though we hate to see the migratory birds dying.

The anti-toxin from the Mainland is very effective in saving the ducks. However, it is all but impossible to get to the sick birds to treat them. The banks of the basin are steep, and the bottom is 20-40 feet of silt which is too soft to walk on and too hard to swim or use a boat in. We did manage to get a few by means of the helicopter, and several more by means of walking on pieces of aluminum roofing tin thrown out in front, as you walk. Unfortunately, most of the kill occurred before we found that it was possible to use the roofing. (Even at best, this is a dangerous practice as the mud acts like quicksand.) We are, however, currently picking up every sick duck we can find. Also, apparently the birds are picking up the poison and flying off to other areas to die.

At present, the population of wild Koloa on Kauai is not in danger of extinction from this one outbreak; however, if the situation continues for a long period of time, the results could be serious. The Lihue Plantation Co. has been most cooperative in attempting to raise the water level at the basin in order to dilute the poison (since it is impossible to drain the area completely). This has been only partially effective, to date. However, I am discussing other ways of filling the basin with them at present.

The situation is perhaps not quite as bleak as it may seem. As you probably know, we have established breeding flocks of captive Koloa both at Pohakuloa with the Nene, and at the Jean Delacour Waterfowl Preservation Center at Salt Lake City, Utah. These flocks are producing well, and we currently have more than 50 Koloa in the Honolulu Zoo where we are holding them for release on Kauai as soon as this botulism outbreak can be overcome.

I'll keep you posted if anything new develops, and I hope to be able to report that we have found a positive solution soon.

The following information is taken from the ENCYCLOPAEDIA BRITANNICA pages 956-957 and the PRINCIPLES OF BACTERIOLOGY AND IMMUNITY by W.W.C. Topley and G.S. Wilson, 1938, pages 1269-1279:

Although a recognizable description of this disease appeared as early as 1735, the term botulism (from Latin BOTULUS, a sausage) was first used in the early 19th century to a type of sausage poisoning observed in Wurttemberg and other places in Germany. Botulism sometimes known as allantiasis, or ichthyosismus, was first described in 1820 by the German poet and medical writer Justinus Kerner, and the causative anaerobic spore-forming bacterium was isolated and described in 1896 by van Ermengem.

The cause of botulism is a highly poisonous substance present in the food eaten. This poisonous substance is produced by a micro-organism, Clostridium botulinum (Bacillus botulinus), of which three varieties are usually recognized--Types A, B, and C. Each type produces a specific toxin against which an antitoxin may be produced. Type A produces the most, Type C the least, potent toxin. Three types may be differentiated from one another by fermentation reactions. All three types are normal inhabitants of the surface layers of the soil and are widely distributed in natural soils in various parts of the world; consequently, it is easy for them to get into foodstuffs. They may be transported by insects, and they may be eaten by horse, cattle and other animals. These microbes possess two significant characters: they are highly resistant to heat, and they grow only in the absence of oxygen. Because of this anaerobic requirement, though the organism is ubiquitous, botulism has always been a very rare disease, and it is becoming still more infrequent.

The symptoms of botulism are quite characteristic and, in contradistinction to several other forms of food poisoning, are mainly nervous rather than gastrointestinal. It causes paralysis and eventually death to the bird consuming the toxic food. Botulism is an intoxication, not an infection. The causative organism, Clostridium botulinum, multiplies in the food before it is consumed, and produces a powerful soluble toxin, which on ingestion is absorbed by the mucosa of the stomach and upper part of the intestine, and gives rise to the characteristic disease. Though the disease is essentially an intoxication, evidence has been accumulating that under certain conditions the organism may multiply to a limited extent in the animal body.

A disease of ducks has been reported in different parts of the world which appears to be a form of botulism. The organism, known as Clostridium botulinum Type C, has been isolated from the liver, and the corresponding toxin has been found in the bodies of ducks dying of this disease. The intoxication appears to be from the consumption of food material in which the organisms have been multiplying, or to ingestion of infected fly larvae.

Other articles on botulism:

AUDUBON, July-August 1965, pages 229-230, THE DEAD LOON MYSTERY by Jack Van Coevering

... The cause is believed to be a poison known as botulism, Type E, but scientists

are not yet entirely positive. Type E is closely related to botulism Types A and B which sometimes develop in improperly preserved foods, frequently with fatal results to human beings. There is also a Type C botulism which thrives on alkali flats and kills ducks.

Although all the evidence points to botulism, Type E, there may be other causes, says Dr. L.D. Fay, the veterinarian in charge of the Game Pathology Laboratory of the Michigan Department of Conservation....

"One thing that makes the botulism hypothesis hard to accept," he says, "is the realization that if botulism is involved, there must be a great amount of toxin available somewhere for the birds to pick up."

Botulism spores from the complex ecology of the lake bottoms may be transmitted some way in the food chain. Further ecological studies are undoubtedly needed....

Loons are mainly fish-eaters, but other aquatic creatures and small amounts of vegetable matter also enter into their diet, and the botulism organism is widespread in lake bottoms. There is also a question as to whether or not fish carry the botulism organism. "That is still in the area of speculation," says Dr. Fay.

THE ELEPAIO, Vol. 13, No. 12, June 1953, pages 80-81, DUCK BOTULISM AT KAELEPULU POND, KAILUA, OAHU:

... This outbreak of duck botulism was apparently for Hawaii a rather unique situation. There was an unusually large number of ducks in Hawaii during the winter of 1952-1953, and aside from Kaelepulu Pond, no other occurrence of botulism was noted. Additionally, as far as could be ascertained, no such outbreak has been reported in the past.

If you know anything about botulism, please share your experiences with the other members by writing to Kojima, 725-A 8th Avenue, Honolulu, Hawaii 96816.

FOR JUNIOR MEMBERS:

CONSERVATION

There is an interesting article on page 12 of the September 1966 AMERICAN FORESTS by Gerald Schneider, "Conservation Education for People."

He asks, "How has conservation education failed?"

He answers, "By not reaching non-conservationists with conservation messages."

In order to communicate more effectively he recommends the following: make conservation meaningful by starting where they are now and leading them forward.

In the past, there has been confusion about the differences between conservation and related terms such as natural science, so he suggests that all conservation communications reflect the following understandings of these terms:

<u>Conservation</u>: Any activity that helps restore, improve, enrich or protect natural resources or the quality of the physical environment of the world we live in; or, teaches more about the need, problems and methods to achieve good resource management or environmental quality.

<u>Natural Science</u> (nature study): The study of animals, plants, rocks, stars and natural phenomena (like weather) for their own sake. There may be no direct application to conservation.

Ecology: A subdivision of natural science concerned with the study of the interrelationships between living things (organisms) and the world they live in (the environment). Ecology provides guidelines for most conservation actions unlike other aspects of natural science.

The following examples illustrate the focus and use of these terms:

--Observing the habits of birds, features of plants, characteristics of soil, or identifying things in nature are natural science activities. But providing more homes for birds, improvement of a stand of trees, or prevention of soil erosion are conservation activities.

--Bob is a New Yorker concerned about air pollution, water pollution and

littering (conservation problems). But he doesn't care about the composition of air, aquatic biology, or the names of roadside flowers (natural science activities).

He further states that it is important to remember that interest in natural science, especially what is popularly referred to as "nature study," is primarily a cultural pursuit for nonconservationists. And natural science learning can be as culturally rewarding as learning history, languages, music or anything else.

Many youngsters and adults may not be very interested in "nature study." After all, the urbanization of our country increasingly removes people from natural environments. It should surprise no one that a person who grew up in the concrete jungles of cities should find nature study culturally unrewarding. Such feelings must be respected or at least understood.

But everyone's health and welfare depends on the quality of the physical environment and natural resources that provide us with food and fibre. This makes conservation mandatory and not just a cultural pursuit. For that reason, we should stress the need for conservation and make conservation activities important to all.

The following excerpt from "The Outdoors is a Classroom" by William Steele in the NATIONAL WILDLIFE, October-November 1965, page 12, is apropos to our discussion:

There was plenty of wildlife to identify, but as one teacher points out, "the last thing you want to learn is the name of the thing." It was far more important, for instance, for the students to notice that seed-eating finches lived in the grassland, while insect-eating barn swallows preferred the ranch buildings, and the heron, fond of fish and frogs, nested close to the water.... Even where children have a great deal of camping experience, it simply means that an outdoor education program can be more academic, with more emphasis on science and leas on simply discovering the out-of-doors and learning to live in it.

What have you done about conservation? As you know, one of the aims of this Society is to arouse public appreciation of the beauty and economic value of wild life, and to stimulate action to preserve and protect it. We in Hawaii are very fortunate -- even in the heart of downtown Honolulu we have trees and birds around us. Let's keep it that way. Let's always be part of nature and get excited about the beauty around us. I hope the following Wordworth's words will always be an exception here in Hawaii, and we'll always be in tune with nature:

> "The world is too much with us; late and soon, Getting and spending, we lay waste our powers: Little we see in Nature that is ours We have given our hearts away, a sordid boon! ... we are out of tune;

It moves us not. -- Great God! ..."

There are many opportunities to share the enjoyment of watching the flowers bloom, of listening to the melodious bird songs, and of smelling the sweet fragrance of some of our tropical flowers. How successful are you with this undertaking? Please share your experiences with other members by writing to Kojima, 725-A 8th Ave., Honolulu, Hawaii 96816.

Have you noticed the plover? Aren't they handsome? Any black feathers, yet? Have you noticed the red Wiliwili (Erythrina variegata) blossoms at the Iolani Palace grounds? Have you seen any birds nesting? Please tell us about your experiences.

LETTER from Violet Hansen, Volcano, Hawaii, January 1, 1967: Plover and Pheasant

... Last evening we had quite a sharp earthquake, and it was interesting to note how greatly it disturbed my two plovers then, with a lot of screeching they took to the air (if I'd had wings I would have done the same).

I had noticed this same thing once before. They apparently feel the quake at the same time we do, whereas the pheasant will squawk prior to our feeling it.

Excerpts from the minutes of the annual meeting of the Hawaii Audubon Society, December 12, 1966:

... The following field notes were given at the meeting:

Jack Throp learned tonight of a discovery (by an acquaintance of his) of a Yellow-bellied Sea Snake at Kailua Beach. This is the third discovery of this species in the past two months. The first snake is on display at the Honolulu Aquarium. (Post note: The snake from Kailua had died the next day, and an autopsy showed the cause to be pneumonia.)

Eugene Kridler observed an immature snow goose at Kealia Pond near Kihei, Maui, on November 23, 1966.

David Woodside has a possible report of a "black bird with yellow feathers" (an '0'o?) from a forester along the Kulani Prison Road on the Big Island.

Eugene Kridler then showed two very interesting movies "Pelican Island" and "The Gooney Bird".

WANTED: Someone to index THE ELEPAIO.

For all these years Janet Bell and Miriam Sinclair did an excellent work on the index, but for the last few years because we weren't able to find anyone to take over, they generously continued with the tedious work.

Surely, there must be someone who can take over and relieve them from this work?

If there's anyone interested in helping with the indexing, please call Kojima telephone 749-985.

MAHALO NUI LOA for your generous KOKUA and work well done.

ALOHA to a new junior member: Candice Carter, 83 Namaea Place, Kailua, Oahu 76734.

If you are interested in attending the 47th Annual Conference of the Western Association of State Game and Fish Commissioners, to be held in Honolulu from July 16 through 20, 1967, please write to 47th Conference, Western Association of State Game and Fish Commissioners, P.O. Box 2198, Honolulu, Hawaii 96805.

MARCH ACTIVITIES:

March 12 - Field trip to study shore birds. Bring lunch, water, and if possible, your car. Transportation cost (\$1.00) to be paid to the drivers. Meet at the Library of Hawaii at 8:00 a.m. Leader: Mike Ord, telephone - 968-771.

March 13 - Board meeting at the Honolulu Aquarium Auditorium at 7:30 p.m. Members are always welcome.

Berger

March 20 - General meeting at the Honolulu Aquarium Auditorium at 7:30 p.m. Program for the night to be announced at later date. Please watch the newspapers.

HAWAII AUDUBON SOCIETY EXECUTIVE BOARD:

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