

# THE ELEPAIO

Journal of the  
Hawaii Audubon Society



For the Better Protection  
of Wildlife in Hawaii

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## A FOREST DIES ON MAUNA KEA\* How Feral Sheep are Destroying an Hawaiian Woodland By Richard E. Warner

Mauna Kea, highest of the great Hawaiian volcanic peaks, thrusts its cindercone- and lava-encrusted bulk 13,784 feet into the cold, thin upper air of the tradewind belt. Despite its proximity to the Equator (20° north latitude) the higher reaches of the mountain experience freezing nighttime temperatures the year around, and for months during the winter season snow hangs on the bare, windswept upper slopes.

The lower flanks of the great peak, especially on the windward sides between sea level and 6,000 feet elevation, are clothed by dense stands of native Ohia (*Metrosideros collina*), and Koa (*Acacia koa*) with a lush understory of several types of ferns and shrubs. Rainfall is so heavy that the wild pig is the only mammal living here.

Above 6,000 feet the plant growth changes abruptly. The dense forest dwindles to a ragged edge, and is replaced by an open woodland of Mamane (*Sophora chrysophylla*), Koa, and in the drier regions Naio (*Myoporum sandwicense*) together with the associated understory shrubs and grasses. This open woodland continues up the slope to approximately 9,500 feet where it abruptly gives way to bare lava and cinder slopes dotted with Puakeawe (*Styphelia tameiameia*) shrubs.

Above 11,500 feet plant life all but ceases; an occasional silversword may be seen glistening in the alpine sunlight, but even the hardy and tenacious Puakeawe finds the environment too rigorous.

Because of the many changes in the flora which have occurred over the century and a half following the introduction to the area of cattle, sheep, goats, and horses which ultimately multiplied to enormous populations, it may prove interesting to note some of the observations made by naturalists while Mauna Kea still retained much of its primeval appearance. The following are excerpts from the journal of the famous plant explorer David Douglas, who hiked into the area in 1834. The passage begins as he emerges from the Mamane forest above either Hilo or La Pahaehoe on his way toward Mauna Kea's summit:

Jan. 7, 1834. -- The wood terminates abruptly, but as the lodge of the cattle-hunter was still about a mile and a half farther up the clear flank of the mountain, situated on the bank of a craggy lava stream, I delayed ascertaining the exact altitude of the spot where the woody region ends (a point of no small interest to the botanist) [sic] until my return, and sate down to rest myself awhile, in a place where the ground was thickly carpeted with species of *Fragaria* (strawberry), some of which were in blossom, and a few of them in fruit.

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\*This article is reprinted from Pacific Discovery, March-April 1960.



-- According to report, the grassy flanks of the mountain abound with wild cattle, the offspring of the stock left here by Captain Vancouver, and which now prove a very great benefit to this island.

Jan. 12, 1834. -- The line of what may be called the Woody Country, the upper verge of which the barometer expresses 21.450 inch; therm.  $46^{\circ}$  at 2 pm (9,300 feet  $\pm$ ) is where we immediately enter on a region of broken and uneven ground, with here and there lumps of lava, rising above the general declivity to a height of three hundred to four hundred feet, intersected by deep chasms, which show the course of the lava when in a state of fluidity. This portion of the mountain is highly picturesque and sublime. Three kinds of timber, of small growth are scattered over the low knolls; with one species of *Rubus* (blackberry) and *Vaccinium* (huckleberry), the genus *Fragaria* (strawberry) and a few Gramineae (grasses), Filices (ferns), and some alpine species. This region extends to barometer 20.620 inches; air  $40^{\circ}$ , dewpoint  $30^{\circ}$  (10,500 feet  $\pm$ ).

We know from his comments that Botanist Douglas had knowledge of the growing populations of feral livestock, brought originally to the Islands around 1800 by Captains Cook and Vancouver, which abounded on the slopes of Mauna Kea. The Kapu (tabu) placed on the animals at the time of their initial introduction had just a few years previously been lifted, permitting Hawaiian commoners for the first time to take them for food. Perhaps fortunately for the botanist's peace of mind it was yet too early for even a trained eye to discern the evidences of overbrowsing and forest destruction which ultimately would become the hallmark of the exotic species.

The years passed and the introduced livestock populations, unhampered by predators and only occasionally disturbed by man, multiplied with enormous rapidity. The weather was mild, the food supply only suggesting the first signs of exhaustion.

By the end of the nineteenth century the exotic species were beginning to eat themselves literally out of house and home. Food became less readily available, forcing the now huge populations of feral stock to travel considerable distances to find sufficient forage. The land too began to show symptoms of stress. Erosion gullies appeared. Flash floods began carrying away vast quantities of the fine, ashy topsoil. The Mamane forest commenced to take on a ragged, sickly appearance.

Around the turn of the twentieth century the upper portion of Mauna Kea was declared a "Forest Reserve" by the Board of Agriculture and Forestry, and incorporated into a territory-wide system designed to protect the forests from further abuse and effect their restoration. Of the 82,600 acres within the boundaries of the Forest Reserve, 29,930 acres are actually covered by some type of forest; the remainder being bare, unproductive lava and cinders. However, of these 29,930 forested acres, only 19,500 acres are used to any extent by the feral populations. This is partly because over 6,000 acres of the south slope of Mauna Kea are very densely wooded with the Naio tree, which is unpalatable to sheep and hence of slight value in wildlife production, and partly the result of continued activities by man in the Pohakuloa Flat area during recent years which effectively frighten the sheep away. It is therefore the remaining 19,500 acres of Mamane forest which must bear the pressure of any population of herbivores allowed to inhabit the area.

Unfortunately, during this period the inadequacy of manpower, funds, and scientific understanding of the nature of the devastation being wrought resulted in a policy of continued neglect. Desultory efforts were made by the Hawaii forester to reduce the number of animals, but the effect was negligible. Activities during this early period of government control were also hampered by poor roads and primitive automotive transport. It was the era of the Model T; and most of Hawaii's roads were either axle-deep in powdery volcanic ash or quagmires of mud.

In 1935 a fence was constructed around the lower boundary of the Mauna Kea Forest Reserve using C.C.C. labor. Ironically enough, the motive for the project was to



prevent the vast numbers of feral animals from descending from the forest into the adjacent pastures of the Parker Ranch Company, where they were competing heavily with domestic livestock for food. At the time the fence was built there were an estimated 40,000 sheep within the Forest Reserve, as well as several thousand goats and an enormous number of wild pigs. The last cow had been removed in 1928, the last horse in 1935.

Today, after a century of degradation, the face of the land is vastly changed. Persons familiar with the mountain in its present state will recognize the areas to which Douglas referred in his journal, but mainly through the geological descriptions. The "upper verge" of the woody country is no longer "highly picturesque and sublime" as Douglas found it, with small timber, strawberries, huckleberries, and grasses. As can be discerned in the accompanying photographs the "upper verge" -- or in contemporary terms the Mamane treeline -- now presents a stark, nightmarish scene of devastation and ruin. Where once Douglas "sate down to rest" among carpets of strawberries one has no choice now but to scuffle about in a waste of rocks, dusty subsoil, and the writhing limbs of dead trees which were unable to withstand the abuse of untold thousands of feral animals.

Conditions are uniformly distressing over practically all of the forested areas: 90 per cent of the topsoil is gone; over 40 per cent of the trees of the Mamane forest are dead, an additional 20 per cent dying. Natural reproduction of Mamane through seedlings or basal sprouts has been so long suppressed by overbrowsing that over most of the mountain there is no young stock whatsoever, either for browse or as replacements for the dead and dying mature trees. Grass production in all but the most favorable areas is limited to a small circle beneath individual trees. It is impossible to state with certainty, but it is estimated that the present carrying capacity of the land is less than 5 per cent of what it was when domestic animals first entered the area.

The Mamane forest itself, lying principally between the elevations of 6,500 and 9,500 feet in a mountain-encircling band, still contains vestiges of the preherbivore state sufficient to allow some deductions about its ecology. The Mamane trees, which reach a mature height of 25 to 30 feet, form a medium for condensing moisture contained in the damp fogs which regularly blow up from the warm, humid lower elevations. Condensing on the leaves of the Mamane trees, the moisture drips through the foliage onto the ground below. It is this "fog-drip" which supplies the bulk of the water requirements both for the Mamane trees and the understory grasses and shrubs, as rains are infrequent and often occur as deluges over short periods of time.

The evidence also indicates that the trees themselves are dependent for life upon the microenvironment which they produce around their roots as a result of this condensate water source. The sequence of plant destruction which has ultimately upset this microenvironment occurred as a stepwise process, being the result of a peculiar trait in the feeding habits of wild herbivores. The insistence of these species upon feeding on the one or two most palatable plant forms in the habitat (in wildlife management referred to as "ice cream" plants) to the exclusion of the less tasty or nutritious forms, places a heavier browse-pressure on some species than on others. If the population is large enough it may at length consume all the available vegetation produced by the ice cream species, at which time hunger forces the animals to shift to the less palatable forms and repeat the process of selective denudation.

And because the Mamane has the rather dubious distinction of being the most palatable plant species still extant on the mountain, there is not and cannot be any natural reproduction or regrowth of this basic element of the native forest. Consequently when an old specimen finally succumbs -- made sickly and weak by the combination of unremitting browse pressure, exposure of the root system through erosion to drying, and freezing temperatures -- there are no replacements to spring up and fill the gap. Year by year the tree line creeps downward from the point where Douglas sat among the strawberries, leaving behind the bones of a once lush and beautiful woodland.



Destruction of the forest will inevitably result in the loss of its associated endemic bird life; for unlike the highly adaptable human species which seems to be able to persist practically anywhere, birds are extremely specific in their environmental needs. The tremendous changes resulting from an extinction of the Mamane forest would far exceed the adaptive capacities of most or all of the native bird species.

The endeavor to control numbers of sheep on Mauna Kea, for the purpose of protecting the forest from destruction, has been inadequate and ineffective for various reasons. In the early years of the Forest Reserve, lack of manpower and of access roads precluded any effective hunting of the sheep population. But in the 1940's sport hunting of the sheep by the public brought about a substantial reduction in numbers of animals. Perhaps likewise there was an epizootic disease in the herds; such has been suggested but data are lacking. In any event, the herds declined until in 1946 the estimated population was down to 5,000 and in 1950 down to 200.

At this point when prospects for restoration of the Mamane forest were brightest, there occurred an ironic reversal of the policy of sheep extermination. The Forest Reserve was turned over to the Division of Fish and Game and renamed the "Mauna Kea Forest Reserve and Game Management Area." The public had developed a taste for sheep hunting and the Division elected to protect the sheep as a game animal -- a policy which led to dramatic resurgence of the depleted herds. As a result of virtually complete protection from 1950 to 1953 and close regulation of shooting in more recent years, the remnant of 200 sheep in 1950 has grown to a herd of 3,500 in 1959. The accompanying graph shows the rate of increase in the population, based on careful censuses conducted annually by the Division; also shown is the increasing hunting kill, which reached 1,900 animals in 1958 and 1,600 in 1959. Despite a 40 per cent harvest, the sheep herds are increasing steadily today.

This raised a basic philosophical question as to the purposes of management of the Mauna Kea area. Before 1950 the orientation had been toward the forest and its preservation; feral animals were considered extraneous to the habitat and to be removed whenever possible. The new philosophy of management may accurately be defined as a policy of "hunter-direction." It is well-typified by this excerpt from a 1955 Monthly Report of the Division of Fish and Game:

The hunters are very apprehensive about overshooting the population on Mauna Kea and creating a similar situation to 1949 which resulted in a five-year closed season. If such a long closed period again becomes necessary through overharvesting, the hunting public will be highly critical, and properly so.

It should perhaps be pointed out that the problem of hunting interests demanding the maintenance of dangerously high herbivore populations is not peculiar to Hawaii. Rather it is a universal problem, one with which many states are presently coping. The overabundance of deer in many parts of the United States, with the attendant problems of overbrowsing and habitat destruction, is in almost every respect identical to the situation on Mauna Kea and elsewhere in Hawaii where excessive herbivore populations are maintained to satisfy the immediate demands of the hunting public. It was this philosophy of hunter-direction which in 1950, despite all the evidence of habitat destruction, prompted the Division of Fish and Game to recommend closing Mauna Kea to sheep hunting in order to "permit the population to rehabilitate itself."

By 1957 any gains which the flora had made during the brief ebbing of pressure in the early 1950's were erased. Coarse, shrubby Puakeawe again became the dominant part of the sheep diet; the brief spark of recovery had been effectively snuffed out. Except for a few roadside strips where hunting pressure forces away the encroaching animals and creates a somewhat illusory impression of recovering habitat, Mauna Kea continues to ulcerate and sicken. Consciously, deliberately, a forest is being destroyed; a rare and unique flora is being needlessly sacrificed.

The science of wildlife management has demonstrated that with proper study and application, most habitats can support both a rich natural flora and an herbivore popu-



lation. The concept of multiple land use is a valid one, but is successfully applied only when the biological necessities of an area are properly understood. Preservation of the Mamane forest is essential to the maintenance of sheep hunting as well as being a moral obligation in itself. If it is deemed in the public interest to maintain a huntable sheep population on Mauna Kea, the numbers should be limited to what the flora can support on a sustained yield basis.

Continued neglect of the present situation can have only one outcome: the ultimate and complete destruction of the habitat. When that occurs we all shall have lost - hunter and conservationist alike. The mountain will then no longer support either sheep or native plants or birds. Modern man will have produced, to his eternal shame and discredit, another biological desert.

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University of California  
Museum of Vertebrate Zoology  
Berkeley, California  
19 April, 1960

Hawaii Audubon Society  
% Miss Charlotta Hoskins  
Experiment Station, H.S.P.A.  
Honolulu, Hawaii

Dear Audubon Members:

As you have perhaps noted, the Honolulu Star Bulletin recently printed excerpts from a report on Mauna Kea's problem with too many sheep. Unfortunately, as a result either of lack of proper study or misinformation from the Division of Fish and Game, the story presented was both misleading and misrepresenting of the facts.

In an attempt to correct this problem I have written to the editor of the Bulletin. I also wanted your organization to be apprised of the errors, and am enclosing herewith a carbon copy of my letter to the editor. You will note that some of the misrepresentations are both gross and distorting of the facts.

I do not believe the mistakes were of deliberate nature by the paper, and feel confident they will attempt to correct them. However, it is vitally important that conservation groups such as yours be kept aware of current circumstances, hence the enclosure.

My best regards to the members of your fine society. Conservation is fundamental to man's future, and it is a pleasure to work together with you toward this end.

Sincerely yours,  
/s/ RICHARD E. WARNER  
Richard E. Warner

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Museum of Vertebrate Zoology  
University of California  
Berkeley, California  
19 April, 1960

Editor, the Honolulu Star Bulletin  
Honolulu, Hawaii

Dear Sir:

May I offer my congratulations and thanks for your bringing to Hawaii's attention the important problem of forest destruction by sheep on Mauna Kea. However, several of your statements were in error, and if left uncorrected will be very seriously misleading. I have listed below for your reference and interest the most important misstatements of your otherwise excellent article.



ARTICLE: The "ravages of time and animals" brought about the destruction of once-beautiful Mauna Kea.

TRUTH: Time played no part in the desecration of Mauna Kea's forest. The primeval beauty of this native woodland would have continued for untold centuries to come had feral livestock not been maintained in such large numbers. The devastation is the result of the foolishness, neglect, and greed of modern man -- nothing more.

ARTICLE: "In the last ten years many sections of the forest have come to life."

TRUTH: Over 90% of the entire forest is an absolute mess. Dead trees and erosion are everywhere. Having covered the entire area I can state this with certainty. The photograph you printed of Puu Laau showing lush vegetation represents less than 5% of the remaining forest. The rest is in a state of near or absolute ruin.

ARTICLE: "Hunters in a little over a decade slashed the sheep population to the last count of 3,000 animals about 6 months ago. But the number is still too high --- etc."

TRUTH: By 1949 the sheep population was reduced to about 200 animals. In 1950 the Board of Agriculture closed the hunting season "to permit the population to rehabilitate itself." Since then hunting has been regulated so that the sheep population has increased from 200 to 3,500 animals, and is still growing today.

ARTICLE: The hybrid mouflon sheep has "non-destructive feeding habits."

TRUTH: There is no evidence - and no guarantee - that the hybrid mouflon sheep proposed as a replacement for Mauna Kea's feral sheep will be less damaging to the habitat than the present form.

Copies of this letter are being sent to conservation groups who have no doubt read with alarm your interpretation of my report on Mauna Kea as it appeared in Pacific Discovery. Thank you again for your interest in Hawaii's conservation problems.

cc: Hawaii Audubon Society  
Hawaiian Botanical Society  
Conservation Council

Sincerely yours,  
/s/ RICHARD E. WARNER  
Richard E. Warner

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#### EASTER VACATION TRIP TO MAUI AND HAWAII By Charles Hanson

The following is a report on my recent trip to Maui and Hawaii. The first birding that I did on Maui was at Kanaha Pond and bird reserve where the Kiwanis Club has set up a telescope and blind for bird observation. Here were seen about 200 Shoveler with the male in beautiful mating plumage. Supposedly they were ready to leave for Alaska for the breeding season. Several Stilt were seen and from the squawking and broken wing show, they no doubt were nesting in the area. Other birds seen in this area were Ruddy Turnstone, Sanderling, Golden Plover and 3 Cattle Egret, the last being a very pleasant find.

Another day we took the trip up Haleakala. Along the roads of the lower level were seen Mockingbird, California Quail, House Finch, Mynah, and other common species. About halfway up the Skylark were much in evidence so we ate our lunch in one of the grassy areas and had a Skylark chorus to serenade us. Also seen were the Ring-necked Pheasant, Apapane and Chukar Partridge. The latter bird was found between 8,000 feet and the summit. Several were seen.

The first day we were on Hawaii, we went over the saddle road to Kawaihae. It was raining heavily when we left Hilo, so no birds were observed until the rain stopped about the time we reached Pohakaloa. Here we met Mr. Ron Walker, the fish and game biologist, who lives there with his family. He showed us around the Nene pens where many pair with young were seen. The young birds were quite large at this time. Also seen were a pair with 2 young which had been trapped on Mauna Loa. They hope to breed in the new blood strain with the other birds in succeeding years to increase the virility and strength of all the birds raised in captivity. We saw also the pens of Muscovy Duck, which, as many of you know, are used to hatch Nene eggs. Mr. Walker also showed



us his sheep project where he is cross-breeding regular sheep stock with the Mouflon sheep, hoping to produce stock which will fit into local conditions.

After leaving Pohakaloa we continued to Waimea and Kawaihae. The Skylark were in profusion on the Parker Ranch area and also seen were the California Quail, Pueo or Owl, and Ring-necked Pheasant besides, of course, the commoner species.

The next place we stopped was at a school at Puuwaawaa. Mr. Walker had told us that the teacher had called him and told him that she thought a Mockingbird was around their school. He wondered if we would check on it. Sure enough, a Mockingbird was seen. As many of you realize, this is unusual because the Mockingbird is not listed for Hawaii.

Next we stopped at the Puuwaawaa ranch to try to see the Hawaiian Crow. We met the new owner, and he told us that he saw the Mamo in the forested area behind his ranch. He says that he has seen it several times. As the area is accessible by horseback only, we were unable to check on it. This can be something for someone to do in the future. While there it started raining hard so we were unable to see the Crow.

The next area that we visited was the volcano area and the bird park. In the bird park the following species were observed: Apapane, Amakihi, White-eye, Cardinal (American), Iiwi, Elepaio, Housefinch, and what I presumed to be an Akiapolaau. I had a quick look at this bird which had a long curved bill like a Honey Creeper. The bill was much longer than any I had ever seen on other birds of like coloration and size. Other birds seen in the volcano area were the White-tailed Tropic Bird or "Crater Bird," the Golden Plover, Lace-neck Dove, Apapane, Iiwi and Omao. The Omao, or Thrush really put on a wonderful singing display for us. Thanks to Mr. William Dunsmire, the park naturalist, I was able to find this bird.

My experience on these two islands convinces me that we are badly in need of some thorough coverage by competent birders in these areas in order that we may have knowledge of the current status of many species. We hope that this may soon be a reality.

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#### FIELD NOTE:

Field Trip, April 10, reported by Dixie Saylor, Bloomfield Hills, Michigan.

One of my sons is quite a naturalist and both he and my daughter have gone with Walter Nickel at Cranbrook Institute of Science. When I had a Girl Scout troop I went too and found it most enjoyable watching birds. We have kept a bird feeder for 20 years and we all enjoy watching our bird friends and keeping track of when they arrive and leave.

We get Sunset magazine at home and when I learned we were coming to Hawaii I sent for their discovery book of Hawaii. In a couple of places it mentioned the Audubon Society having Bird Walks two Sundays a month, and as we were to be there two Sundays, I dropped a line to the P.O. Box. Mr. Hanson called the hotel and told me they were meeting at the Library of Hawaii on April 10th. There I was introduced to the members.

We went first to Sand Island for shore birds where we saw black crowned night herons, Hawaiian Stilts, ruddy turnstones, tattlers and sanderlings -- all new to me; then to the ranch where we saw 9 white egrets in the cattle field (Cattle Egrets).

After lunch we went to the alfalfa field where there were chukar partridge and there must have been 200 plover (Pacific golden) flocking to go North to nest. They made quite a sight as they sat on the ground near the big sprinklers where the hay had been cut and they were all headed into the wind. Too, we heard the English skylark singing high in the sky at the same place.

The scope helped me to see these birds, new to me, very well and everyone was so generous sharing their glasses, car space and lunch.

At one spot we watched them burn a cane field which was another first for me and a most spectacular one.

I got two of your bird books at the Hawaiian Village bookstore and saw the elepaio,



amakihi, apapane and iiwi in the National Park around the Volcano House.

I hope if any of you are ever in Bloomfield Hills, Michigan, I can return the courtesy.

Thank you again for your kindness.

Dixie Sayler  
1535 Island Lane, Bloomfield Hills, Mich.

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Field Trip of April 24, 1960.

Promptly at 2:00 p.m. twelve people in three cars started out for the first experimental late afternoon and early evening field trip. The score was tied, six members, six visitors. A Chicago visitor turned out to be an enthusiastic birder.

In consideration of the weather and an adverse report of road conditions the trip was diverted to the lower trail of Palehua rather than to Poamoho. The Silk Oak was blooming profusely in all it's magnificence. Also Koa and Sandalwood were in bloom, offering the birds good feeding.

Birds were in abundance, flitting and swooping, so that identification was most difficult. Amakihi, White-eye, Elepaio and Leiothrix were positively identified along with a Strawberry Finch which sat quite demurely while several of us made a good study of it. Other Finch and Apapane were heard and, of course, Dove were plentiful all around.

Exhausting the possibilities, we proceeded to the summit where we ate our lunch while observing a Strawberry Finch enjoy a mud puddle. However, the highlight of our lunch period was a show of beauty performed just a few feet in front the cars by a Leiothrix feeding along the ground and lower foliage.

Pheasant called as we waited at the lower gate, climaxing the day. Our visitor from Chicago perplexed us with description of a bird seen near the Attorney General's office and the S family finally decided it must have been a Plover without the winter plumage.

Frank L. Stephenson

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From Dr. Norman P. Hill of Fall River, Mass., to Ruth Rockafellow: April 25, 1960.

I want to thank you again for the guide service you gave us two weeks ago on the Aiea Trail. We enjoyed it very much. We saw the expected things at Rabbit Island that afternoon and, nicest of all, a lovely White Tern quite close to shore at the Blowhole.

Over on Maui, we were impressed by the scarcity of all birds, that is, landbirds. But in a pond, allegedly a Sanctuary, quite near the Kahului Airport, there were some 50 Stilts and 50 Shovellers. The latter were in pairs and courting; their behavior so strongly suggested breeding to me that I would suggest looking into the matter as I believe they have never been known to nest in the islands!

On Hawaii, we found the ohia in full blossom and the woods literally swarming with Apapanes and Amakihis. We found a few Iiwis at Thurston Lava Tube as you predicted and at the same place we had excellent studies of a pair of Psittirostra psittacea (Are they the "O-u"? ) with their parrot-like bills and yellow heads.

Again thank you for your kindness and assistance.

Yours sincerely,  
/s/ Norman P. Hill

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Communications received and answered by the Secretary:

Mrs. F.E. Heinzelman, Encinitas, Calif. inquired where to find the Island's most interesting birds.



Communications received and answered by the Secretary: (Continued)

Audubon Society, Berkeley, Calif. outlined plans for the Audubon West Coast Convention in 1961 and asking for suggestions and recommendations. Are anxious to have us take part.

Carter Bundy, N. Miami Beach, Florida asking us to supply nesting and other pertinent information re the Cattle Egrets.

Robert M. Schwab, St. Paul, Minn., requests information re any booklets we have published.

Linda Elek, South Gate, Calif. (school child) asking for pictures, a booklet or some kind of information about Hawaii.

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NEEDED TO COMPLETE: A volume of the Elepaio, #11, vol. 18, May 1958. Anyone willing to part with this issue of the Elepaio, please send it to Margaret Newman, P.O. Box 5032, Honolulu 14, Hawaii.

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Frank Richardson is coming to Hawaii on June 13th, to make an ecological study of the forest birds of Kauai supported by the McNerny Foundation and Samuel and Mary Castle Foundation and sponsored by the Bishop Museum.

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JUNE ACTIVITIES:

FIELD TRIPS: FRANK STEPHENSON WILL LEAD BOTH TRIPS.

June 12 - Trail taken will be governed by the weather conditions and transportation available.  
Meet at the Library of Hawaii at 7:00 a.m.

June 26 - To Poamoho Trail, if weather permits.  
Meet at the Library of Hawaii at 2:00 p.m. Please note the time - 2:00 p.m.

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MEETING: Board - June 13, at the Hawaiian Mission Academy, 1415 Makiki Street, at 7:30 p.m. Members are always welcome.

General - June 20, at the Honolulu Aquarium Auditorium at 7:30 p.m.. Charles Hanson will give the illustrated talk on Hawaiian birds, which was deferred from last month.

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HAWAII AUDUBON SOCIETY OFFICERS:

President:	Charles Hanson
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