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SHOULD THE AXIS DEER BE INTRODUCED TO THE ISLAND OF HAWAII? By C. H. Lamoureux Associate Professor of Botany, University of Hawaii Presented at the Hawaiian Botanical Society meeting on 3 June 1968

As I see it, there are four possible kinds of reasons for introducing this deer to Hawaii. These are <u>esthetic</u> <u>recreational</u> <u>economic</u> <u>scientific</u>. Let's consider each of these reasons in some detail.

ESTHETIC

Axis deer are beautiful animals, and I am the first to admit this. J.R.(Dick) Woodworth, at that time Chief of the Bureau of Game, at a meeting of the Flora Committee of the Conservation Council for Hawaii in the mid-1950's, made the statement that most people would rather see a deer than a native plant any day; (this was followed by the statement that it might be a good idea to replace the native flora with something better able to stand the competition). Almost all people, including botanists, enjoy looking at animals, and there is a special thrill in seeing a wild animal in its native habitat. However, the axis deer in Hawaii is not in its native habitat, and, in my opinion, would be better observed in a zoo than running wild on the island of Hawaii. Furthermore, I suggest that the sight of a silversword or an 'ohi'a-lehua tree in full flower is as esthetically pleasing as the sight of an axis deer in a kiawe forest, although I realize that my opinion may be a minority one.

RECREATIONAL

Although I personally am not a hunter, I will readily agree that hunting is a wholesome form of recreation, and that under proper management in most areas hunting can be used in an accurate and scientific way to increase the productivity of the area and maintain optimal herd sizes. In some cases in Hawaii hunting is undertaken primarily to supplement the food supply, as it is with pig and goat (and apparently even deer where poachers are concerned on the island of Molokai). But basically in Hawaii axis deer hunting is a form of recreation. In order to place it in proper perspective, we need to consider how this form of recreation compares with other forms of recreation available in Hawaii.

My figures are admittedly somewhat out of date, but a research report on axis deer prepared late in 1960 by the Division of Fish and Game suggested that for the year 1961 some 450 hunter days would be needed to maintain a stable population of axis deer on Lanai.

Assuming a similar figure for Molokai (which may be over estimating the mark somewhat, as many of the deer on Molokai are on private property and not available to the average hunter), we still arrive at something less than 1,000 man-days per year devoted to this form of recreation. During the fiscal year 1960-61, the State issued 6,214 hunting licenses, of which 120 were purchased by out-of-state residents. Thus it seems obvious that the hunting of axis deer is only a small part of the recreational hunting which occurred in Hawaii at that time. While figures for the last year would undoubtedly show a larger number of hunters, and probably a larger number of axis deer hunters, I expect that the proportion of deer hunters to other hunters would not have increased, and that the total number of man-days devoted to recreational hunting of the axis deer is minuscule compared with the number of man-days devoted to other forms of recreation. In fact, I would venture the guess that well over 1,000 man-days per year are devoted to the recreational activity of looking for native plants, birds, land snails, and insects.

ECONOMIC

Hunting is big business in the U.S. As such, hunters and gun manufacturers wield tremendous political power. Witness the lobbying activities of the National Rifle Association and other hunting organizations that were able recently to prevent the passage of a reasonable, sensible, and necessary gun control bill by the U.S. Congress. On the other hand, hunting (especially of axis deer) is not yet big business in Hawaii - again for 1960-61, the total income derived from hunting license purchases in Hawaii was \$30,202.25. Yet, the political power of hunters in Hawaii is obviously great, as reflected in the recent State Supreme Court decision overthrowing an injunction obtained by ranchers which would have prohibited the introduction of axis deer to the island of Hawaii. Apparently even though the ranching business has proven its ability to contribute significantly to the economy of the state, the learned members of the Supreme Court were more impressed by the rather tenuous benefits which could presumably be obtained by introducing axis deer to the area.

As far as I have been able to observe, the presence of the axis deer on Molokai has had very little beneficial effect on the economy of the island - except perhaps in the case of George Murphy, owner of Puu O Hoku Ranch, where one can (for a price) shoot deer on private property. Elsewhere on Molokai I can see no signs of economic development which could be attributed to the presence of the axis deer - in fact there is little evidence of economic development at all on Molokai.

I would predict that, were figures available, it would be revealed that the total dollar contribution to the State of Hawaii from the axis deer is somewhat less than the amount which the State has expended on studies of the animal, and will spend on attempts to establish it elsewhere in the State.

On the other hand, scientific research in Hawaii is rapidly becoming big business - and much of this research is based on the unique opportunities we have here to study evolution and distribution of native Hawaiian organisms. As I hope to show in a few minutes, the presence of axis deer does nothing to enhance these real natural biological resources, but may contribute to their disappearance.

Scientific research is becoming big business in Hawaii. One needs only turn to any newspaper and chances are at least one in five there will be an article about Hawaii as a center for research in Oceanography or some related field. One rarely hears about research on terrestrial organisms, but lots of it is being done and lots of it is receiving support from the Federal Government and other sources outside the State. While I am not so naive as to think that Federal Money is free (which many politicians would like us to believe), federal grants for scientific research do represent funds coming into the State which might otherwise go somewhere else - in this sense then, they are a contribution to the economy of the state. During the past few years, something over half a million dollars has been spent in a study of the evolution and genetics of the 700-odd endemic Hawaiian species of the fruit fly, <u>Drosophila</u>. From this study the scientific community is gaining considerable information on the subject of evolution on small oceanic islands; the State is obtaining income from a new source. Another grant of over half a million dollars has recently been given to the University to search for and study natural products of the Pacific - i.e. products available from plants and animals which may have some value as sources of drugs or other products of economic interest. Native Hawaiian organisms are the object of considerable attention in this study. On a more modest basis, the National Institutes of Health are investing some \$40,000 in 1967-69 in a search for potential anti-cancer agents in Hawaiian plants. Although budget cuts necessitated by the war in Viet Nam have temporarily shelved the project, plans have been made for the Hawaii Project of the International Biological Program, which would involve the expenditure of perhaps \$2.5 million over a five year period. There is still a good chance that this project will be activated as funds become available. Considering expenditures from all sources, I would estimate that between 1/2 and 1 million dollars a year come into this state to study the unique organisms which are found only in Hawaii and no place else on earth. I wonder if the axis deer could contribute this much to the economy of the state even if it were allowed to spread into every acre of suitable habitat?

SCIENTIFIC

There may be some scientific value in studying the behavior and ecology of the axis deer in a foreign environment, as Hawaii is, but this seems to me to be of minor significance.

Just what do we have in Hawaii in the way of biological natural resources? Dealing only with terrestrial organisms, since even I can't imagine axis deer eating seaweeds or cowries, we have in the native biota perhaps 2,000 species of higher plants, 4,000 to 5,000 species of insects, 1,000 species of terrestrial molluscs, 100 species of birds, and one bat. Of the higher plants, nearly 95% of the species are endemic to Hawaii, more than 99% of the insects and land shells are endemic, and most of the land birds are endemic, including 40 or more species in the endemic family Drepaniidae.

These terrestrial organisms have evolved together and are dependent on one another. If some of the organisms are destroyed - for example, the plants - the birds, insects, and land shells will also disappear. Many unique relationships have developed during the long evolutionary history of Hawaiian organisms. To give just one example, biologists working with the endemic species of <u>Drosophila</u> in Hawaii have found that one group of species is able to reproduce only in decaying stems of the endemic lobeliad <u>Clermontia</u>. Apparently the larvae feed on a particular yeast which grows in this highly specialized habitat.

The devastation wrought on the vegetation of the Hawaiian Islands by man and his introduced plants and animals in the past 190 years is well known to all of us, and I need not list the species which have disappeared or been greatly reduced in number during this time. However, we must reiterate that along with the destruction of the vegetation goes the destruction of birds, insects, snails, etc. Also, this is often followed by soil erosion, landslides, floods, and other destructive events. It is significant that the rediscovery of some species of presumably extinct native birds in the past 10 years has been in only two areas - the Alaka'i Swamp on Kauai and Kipahulu Valley on Maui. In both these areas disturbance in the past has been only minimal. The native vegetation has persisted nearly intact, and with it the other native organisms have persisted.

The question that next arises is: What has been the role of the axis deer in contributing to this destruction of vegetation on Molokai and Lanai, and what would be its expected role on Hawaii? The facts and observations with which the scientist deals are hard to come by - since no ecologists established permanent plots on Molokai or Lanai before the introduction of axis deer, we can only reconstruct the picture from bits of evidence which still persist. Whether this reconstruction will have any value in predicting what will happen on Hawaii is not known. The Division of Fish and Game has conducted research on the ecology of the axis deer on Molokai and Lanai during the past 10 years, but botanists have been remiss in not collecting data which would have a bearing on the problem. We must do so, for 15 years from now when this Society meets to discuss a proposal (probably after the fact) to release the white-tailed gnu on Maui or the reticulated giraffe on Hawaii, we should have some facts at hand.

I think that all would agree with the following comments:

- 1. The Hawaiian biota evolved in the absence of grazing or browsing hoofed animals.
- 2. Hawaiian plants have evolved little in the way of protective mechanisms (spines, thorns) against such animals.
- 3. Hawaiian plants are quite sensitive to damage by trampling, and have evolved few or no adaptations to trampling.

If you agree with these comments, which I believe to be biologically sound and to be demonstrated in the flora, you can see that grazing and browsing hoofed mammals are likely to have an especially drastic effect on the flora. This is not an original thought of mine, but has been proposed many times before, especially by New Zealand biologists who have had ample opportunity to observe the disastrous effects of the introduction of such mammals on a flora which had evolved in the absence of mammals. Members of our State Division of Fish and Game have expressed the opinion that New Zealand is entirely different from Hawaii, and that just because mammals were destructive in New Zealand does not mean that they will be so in Hawaii. After spending a year in New Zealand I am prepared to agree with the first part of the statement - that New Zealand is entirely different from Hawaii. Although the New Zealand flora evolved in the absence of large grazing mammals, it evolved in the presence of large grazing birds, the moas. Many species in the New Zealand flora seem to me to be much more resistant to grazing and trampling by sheep, goats, cattle and deer than do native species in Hawaii. Therefore, the effects of such animals on the Hawaiian flora are likely to be even more drastic than in New Zealand. We should not lightly brush off warnings from New Zealand ecologists.

One question which has received much attention is the habitat which the axis deer will choose if allowed to go about its business undisturbed by man. In India where it is native it is essentially a lowland species living in forests. In Hawaii it seems also to stay in the lowlands in most places - except on East Molokai where it gets up to over 2,000 feet elevation. In Hawaii, while most abundant in open kiawe forests, it is not confined to forests but can live in nearly treeless dry lowlands and in grasslands, as well as on the edges of pineapple fields.

Analyses of stomach contents show that deer living in kiawe forests with klu thickets eat mostly kiawe and klu; when they live where guinea grass, 'ulei, and pukeawe are abundant they eat guinea grass, 'ulei, and pukeawe; in the high wet areas of east Molokai where drymaria, hilo grass and gouldia are common, they eat drymaria, hilo grass and gouldia. Obviously then, they do not discriminate strictly between herbs, grasses, and woody plants, or between native and introduced species. Apparently at times the deer eat significant quantities of pineapple plants. Undoubtedly there are plants, perhaps some native ones, which the game biologist calls "ice-cream" species, which are sought out and consumed preferentially by the deer, but to determine which species these are still requires considerable study. Should some fairly rare endemic plant have some of these "ice-cream" qualities it could obviously be exterminated by the deer. I can't say that the deer have yet caused the extinction of any native plant species -- I don't know. But it is possible that they have and that they may in the future. The presence of deer trails in some areas also suggests that they can have a detrimental effect by trampling on native species, in other cases plants are killed when deer rub their antlers on trees and in the process remove the bark.

In the past the issue has been raised as to whether the deer can penetrate into and open up areas of otherwise undisturbed rain forest in Hawaii. Evidence to date has not suggested that the axis deer will do so - it seems to prefer to remain in

somewhat more open areas. However, in the past cattle (primarily), goats, and sheep have opened up such areas, and the deer can follow them into the somewhat more open forests. Then, even if the cattle are removed later, the deer, if present in sufficient numbers, can prevent the regeneration of the forest, and the area will remain in a decadent, biologically uninteresting state as long as the deer remain. This is well illustrated on the plateau north and east of Halawa Valley on Molokai where deer are now present in large numbers, and where the native vegetation is in horrible shape. Thus, even though the axis deer has not yet been demonstrated to be able to invade undisturbed rainforest, it can prevent the regeneration of this forest. Two ecologists, Frank Egler and William Hatheway, who carried out significant field studies in Hawaii (their stay here was measured in terms of years, not weeks) have suggested that in the absence of disturbance species of the native flora are able to come back into formerly disturbed areas, and that gradually there would be an increase in native species, a decrease in introduced species. The deer seems to be preventing this today on Molokai and Lanai, there is no reason to suspect that it would not function in the same way on Hawaii.

Many of our rarest species today are those of dry forests - such forests have been exploited since the early days of European contact, and some of the best ranch lands are located in areas which once supported these dry forests. The axis deer seems also to prefer such habitats, dry areas with open forests. It is just such areas which can stand the least disturbance today. There are still some exceedingly rare plants persisting in the Puu Waawaa region of Hawaii. Should the deer get into this area it could be disastrous, since it is hard enough for these plants to hold their own now in the presence of cattle and fountain grass.

The main reason I object to the introduction of axis deer to Hawaii then is that this provides just one more factor disturbing the environment in which the native biota is struggling to survive. This one more disturbing factor may be just enough to tip the scales such that a few more species of native organisms become extinct.

CONCLUSIONS

I started with four kinds of reasons for introducing axis deer to Hawaii. The esthetic reason is a reflection of personal taste, and one can't legislate taste, but I feel that even for this reason the evidence is not all in favor of the deer.

As for the recreational factor, I feel that the recreational potential of hunting axis deer is extremely limited at best, and this alone should not be sufficient reason for the introduction of the deer. On economic grounds, I feel that the economic potential of the native biota is significantly greater than the economic potential of the deer. Finally, on scientific grounds I feel that the overwhelming weight of the evidence is in favor of protecting the native biota as far as possible, which would involve excluding as many disturbing factors as possible, one of which is the deer.

What can we do at this point? Despite hours of oratory, many letters, and lots of supporting documents, the botanists have not succeeded in convincing the Fish and Game people that deer are not good for Hawaii. In fact, the Fish and Game people have been operating on the opposite assumption, that if a few deer on a few islands are a good thing, then lots of deer on lots of islands are even better. Even the courts seem convinced of this.

The most effective control would be to work with Constitutional Convention delegates for the passage of an article in the constitution which would prohibit the importation of any new game mammals to the state, and would prohibit the introduction of such animals to any islands where they do not now occur. This would leave deer on Lanai and Molokai for the small part of our population who now hunt them. However, I am not optimistic about the chances of getting such an item into the Constitution. We could adopt methods of protest, such as demonstrations and sit-ins, which have been popular in academic circles in recent weeks. However, such methods have not been very effective in producing positive results.

What we really need are two things - more research on the effect of the axis deer on the native biota of Hawaii, so that we can back up our case with hard facts; and a public educational campaign which emphasizes the importance of the native biota. I think that the weight of economic and scientific evidence is in favor of keeping the axis deer off the island of Hawaii. I hope discussion following these remarks will lead to some practical means of accomplishing these objectives.

Editor's note: Please send in your comments and suggestions to Kojima, 725-A 8th Avenue, Honolulu, Hawaii 96816.

> FEEDING HELPERS AMONG IMMATURE WHITE-EYES* By C. Robert Eddinger

Skutch (CONDOR, 63:198-226, 1961) defines a helper as "a bird which assists in the nesting of an individual other than its mate, or feeds or otherwise attends a bird of whatever age which is neither its mate nor its dependent offspring." Helpers may be intraspecific, and aid others of their own kind, or interspecific, and assist birds of different kinds. Helpfulness is expressed when a bird sounds an alarm cry at the approach of danger, causing all the birds in the area to take flight. Another common way of helpfulness among birds is in feeding. An excellent discussion of the role of helpers, as well as an annotated list of numerous species known as helpers, is given by Skutch (op. cit.), but he does not mention the Zosteropidae.

The White-eye (Zosterops palpebrosa japonica) was introduced from Japan to Oahu in the Hawaiian Islands in 1929 and has increased rapidly and spread to the other major islands since its introduction.

My first White-eye fledgling flew through the open window into our laboratory at the Waikiki Aquarium on 27 April 1966. It was just barely able to fly and had not yet developed its characteristic yellow throat and white eye-rings. This bird was tame and demanded food every 8 to 10 minutes. It quickly swallowed any food placed into its mouth and would continue to beg until satisfied. I fed the Whiteeye papayas, bananas, avocados, mangoes, egg-yolks, and mixed cereal. This bird became independent by 15 May, when it was about 29 days old.

On 31 May 1966 I found two fledgling White-eyes on the lawn at the University of Hawaii. Both were under the same tree, and a nest was found blown to the ground nearby. I hand-fed White-eyes No. 2 and 3 for 12 days. My first White-eye was now eating by itself but still begged when I came to the cage with food. It had not yet developed the white rings around the eyes.

Because of a busy examination schedule, plus the fact that White-eyes No. 2 and 3 were demanding food every 8 to 10 minutes, on 11 June 1966 I placed Whiteeyes No. 2 and 3 into a large cage with White-eye No. 1 and a number of finches. The first White-eye immediately flew to the newly introduced birds and, when they began to beg, carried food to them and fed both young. Whenever I came to the cage, the older White-eye flew to my finger, begged for food, and carried it to Whiteeyes No. 2 and 3. No more hand-feeding was necessary for any of the birds.

I found a fourth White-eye fledgling on the lawn of the university on 28 June 1966. When I placed this bird into the large cage, the three older White-eyes immediately began carrying food to it. All three of the immature birds continued to feed the fledgling until it was able to secure its own food.

On 26 July 1966 a fifth fledgling White-eye was given to me. When I placed this bird into the cage with the others, there was an immediate conflict over feeding. All four immature birds carried food to the fledgling, but, as one bird approached to feed the fledgling, the others flew into it, causing it to drop the food or swallow it. The finches also were constantly chased if they approached the fledgling.

After 24 hours without any cessation of the feeding conflicts, I removed the fledgling and placed it in a small cage attached to the side of the large cage. This enabled me to hand-feed the fledgling and yet did not isolate it completely from the older White-eyes. Within three minutes after the fledgling had been placed into the small cage, the four older White-eyes were on the wire near the fledgling, and, when it begged, the four birds passed food through the wire to it.

On 28 July 1966 I again placed White-eye No. 5 into the large cage. For 30 minutes there was a constant conflict among the four older White-eyes. Then each bird took food to the fledgling, and each in turn fed it. At times one bird would be feeding the fledgling while the other three birds perched beside it with food ready for feeding. This feeding behavior continued until the bird was able to secure its own food.

These birds also showed a high degree of group preening. I have on numerous occasions observed one bird preening another while the second bird was preening a third. There also appears to be much body contact between immatures. The five birds sleep, and often perch during the day, so closely that they look quite like one bird with five heads.

*Reprinted from THE CONDOR, Vol. 69, No. 5, September-October, 1967 pp. 530-531.

Field Trip to Na La'au and Koko Head, June 9, 1968.

The June 9 field trip covered Koko Head and the Na La'au Arboretum on Diamond Head. The Na La'au area has become a point of concentration of escaped, or released, cage birds, mostly African finches. About a dozen different species have been recorded there. The dry habitat of grass, shrubs and scattered trees is similar to the semi-arid region that is the natural habitat of many of these birds. Older introduced birds that are common in the area are House Finch, North American Cardinal, White-eye and both doves. We found a Common Waxbill and a male Napoleon (or Yellow-crowned) Weaver and had a fleeting glance of what was suspected to be an Orange-cheeked Waxbill. With the Weaver were two birds of similar size which were light brown above with distinct dark striping except on the rump which was plain buff. Bill and legs were flesh-colored. Underparts were whitish, one bird having a small amount of faint streaking. There was a yellowish line over the eye, darker cheeks, and a less distinct yellowish line below. Call notes were buzzy. The association with the male Weaver and the description led us to believe these were female (or male in immature or winter plumage) Napoleon Weavers - possibly a pair with a young bird. Up to now only adult males have been reported. It is interesting to note that the normal habitat of this Weaver is marshy country.

At Koko Head our primary interest was the Fairy Terns. As we reached the summit two flew overhead and later, down in the saddle area, single birds flew over twice, although none approached as close as they often do. Henry Yuen had seen as many as eight at Koko Head during the first week in June. He reports that they are more likely to be seen in the morning prior to 10 or 11 o'clock.

We spent an hour watching the seabirds fly by, on their way back to breeding colonies on Manana and Moku Manu. In addition to several hundred Sooty Terns, we saw about 50 common Noddies, two Wedge-tailed Shearwaters, and one each Brown Booby, Red-footed Booby and Frigatebird.

J. Richard Gauthey

Field Notes from Mary M. Roberts, 26 June 1968: White-cheeked Bulbul

Two weeks ago I became alerted by a strong call and animated chirping in my cypress trees by the screened porch. At first I thought it was a Brazilian Cardinal, but suddenly I saw these two strange birds flutter from cypress to olive tree not more than two feet away from me. They were not one bit afraid and continued hopping from branch to branch apparently befriending a young male Kentucky Cardinal, who seemed somewhat surprised by these strangers. The birds were identical, about the size of a Brazilian Cardinal, but of a darkish color all over. When the sun touched them they appeared dark brown. Their crest stood forward at a rakish angle. They had snow-white patches on either cheek and under the chin. My sister, who was visiting me from California, checked BIRDS OF THE WORLD by Oliver L. Austin, Jr., and we are convinced that the birds were the white-cheeked bulbuls. When I described the birds to my cousin, who lives in Manoa Valley, he immediately knew I was describing a pair he had also seen. I later heard a resident on Keeaumoku Street describe these birds also. I live on Makiki Street. I am curious to know if anyone else has sighted these birds and was able to identify them.

Editor's note: The red-eared bulbul has been reported from Makiki, and the redvented from other areas, but this is the first report of the white-cheeked bulbul. If you have any information on this bird, please share your experiences with the other members.

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From Henry Yuen, June 6, 1968: Fairy Tern

Today, June 6, Chris Thompson, Ronald Goo and I hiked up Koko Head in the morning to observe the fairy terns. The weather was clear and sunny. At 9:30 we began to see groups of fairy terns fly by above to the ocean and above us coming from the direction of Diamond Head. They were in groups of five to eight birds. Also seen were several groups of gray-backed terns (on a second thought, perhaps they were sooties instead, because of what Commander Gauthey told us about sooties looking a little gray at times) in groups of eight to ten birds. They were making noises as they flew. Within Koko Head itself were eight fairy terns hovering and flying around the kiawe trees in groups of three and five, whereas on June 4, I saw only three terns hovering in another area of the crater. We had good close look at the birds, and it was fascinating as they came to us, hovering within three feet of our heads. One looked as if it was considering landing on Chris's shoulder. They made noises which Ronald and Chris agreed to sound like a Jew's-harp. Two other calls included one which sounded like an ordinary seabird grunt and the other a extremely high pitched call. There were no eggs or nests seen. One interesting thing we noticed was a tern hovering above and following a rolling rock all the way down a hill.

Also seen were owl pellets, sparrows, linnets, and both species of cardinals. Though the fairy terms were flying in the crater when we arrived, as we left at 11:00 a.m., they were suddenly gone.

On the way back, down the slope on the Diamond Head side of Koko Head, groups of common noddies were seen flying by over the ocean. Chris saw what we thought at first was a barred dove. But since it was feeding on rocks pounded by surf, we looked again. It turned out to be a wandering tattler.

Excerpts from the minutes of the general meeting, Hawaii Audubon Society, April 15,1968:

... Margaret Titcomb presented leis to Mr. and Mrs. W. Michael Ord, who are leaving the islands for Guam, where Mr. Ord will be associated with the Guam Branch of the Bank of Hawaii.

Mrs. Wendy Nakanishi, showed an excellent presentation of slides and recorded lecture that she has prepared on seabirds in Hawaiian waters, to give to her fourth grade classes....

Mr. Michael Ord, then gave us a farewell program of his latest slides of birds, covering the world from England west to Guam....

May 20, 1968: ... Richard Gauthey gave a report on the field trip to Ulupau Head for April 21, and a report for the field trip to Poamoho on May 12....

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Dr. Andrew Berger introduced our speaker Sheila Frings, who presented slides and a talk on the 'Elepaio. This presentation was a result of her research on the life history of the 'Elepaio for her Master's thesis at the University of Hawaii. It contains a great deal of new and original material...

June 17, 1968: ... Dick Gauthey gave a report on the field trip of June 9 to Na La'au and Koko Head. At Na La'au the highlights of the trip were the sighting of two exotic species, the Napoleon Weaver and the Common Waxbill. At Koko Head at least two Fairy Terns were observed as well as a number of seabirds out over the ocean...

Our field trip chairman, Dick Gauthey, is leaving the Islands next month for the Mainland. The President commended him for such a fine job, and the Society presented him with a lei. Our new field trip leaders will be Col. and Mrs. Charles G. Kaigler...

Jack Throp told the meeting about a Barn Owl, a bird introduced by the State for rodent control 8 to 10 years ago, that was found on the boat "Yellow Fin" 35 miles out to sea. He also told us news of new and old animals at the zoo.

Walter Donaghho announced seeing a Paradise Whydah Finch in Kapiolani Park this past week.

President Margaret Titcomb introduced our speaker, Miss Beatrice Krauss, who is a plant physiologist at the Pineapple Research Institute. She spoke to us on the inadvisability of introducing axis deer to the Island of Hawaii by the Department of Land andNatural Resources.

At the close of the meeting, Dick Gauthey told us about a trip he made to the Alaka'i Swamp area on Kauai to see rare native drepanids from May 30 to June 2 with Ian Atkinson and Colin Huddleston. Ian Atkinson played a recording he made on the trip of the '0'u, 'Omau and Puaiohi....

ALOHA to our new members:

Mrs. Hildegard Kaigler, 3363 Anoai Place, Honolulu, Hawaii 96822 Corintha Winterbottom, 44011 Aina Mai Place, Kaneohe, Oahu, Hawaii 96744

HAWAII'S BIRDS, a field guide, available for \$2.00. Send in your orders to: Book Order Committee, Hawaii Audubon Society, P.O. Box 5032, Honolulu, Hawaii 96814.

AUGUST ACTIVITIES:

| August | 12 | | Board meeting at 3653 Tantalus Drive at 7:30 p.m. Members welcome. |
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| August | 19 | - | General meeting at the Waikiki Aquarium Auditorium at 7:30 p.m. |
| | | | Program for the night: Speaker - David Burckhalter, graduate |
| | | | student from the University of Arizona |
| | | | Topic - Sooty Tern on Manana (color slides) |
| August | 25 | - | (PLEASE NOTE DATE) Field trip to Manana to study seabirds. Trip |
| | | | will be limited to Society members. Boat fare is estimated at |
| | | | \$3.00. Meet at the Library of Hawaii at 8:00 a.m. |
| | | | Call Charles G. Kaigler for reservations, telephone 988-3195. |
| | | | |

HAWAII AUDUBON SOCIETY EXECUTIVE BOARD:

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