PROCEEDINGS of the HAWAIIAN ENTOMOLOGICAL SOCIETY for 1964

VOL. XIX, No. 1
JUNE, 1965

Suggestions for Manuscripts

Manuscripts intended for publication should be submitted in duplicate (original and one carbon), typewritten in double or triple space, with ample margins, on one size of standard-sized (8 ½ by 11 inches) white bond paper; pages should be numbered consecutively. Fragmentary sheets and slips pinned or pasted on are not acceptable. Footnotes should be numbered consecutively and inserted in the manuscript immediately below the citation, separated from text by lines; they should be used only where necessary. Correct names and references are the responsibility of the author and should be checked for accuracy.

Illustrations should be drawn to allow for one-half or one-third reduction to page size (4 ½ by 7 inches). Maps and sketches drawn to scale should have the scale plainly indicated. A complete list of figure legends and a duplicate print of each plate or figure are required to be submitted with the manuscript.

Tables and graphs should be used only where necessary, and omitted if essentially the same information is given in the paper. Graphs and figures should be drawn in India ink on white paper, tracing cloth, or light blue cross-hatched paper.

Proof should be corrected as soon as received and returned to the editor with an abstract on forms provided. Additional costs to the Society for author's corrections in proof may be charged to the author. An order for reprints should be placed with the editor when proofs are returned. Fifty copies of reprints will be supplied by the Society to each author under certain circumstances.

Examination of articles in this issue will help to conform to the style of presentation desired.

PROCEEDINGS
of the
Hawaiian Entomological Society

VOL. XIX, NO. 1 FOR THE YEAR 1964 JUNE, 1965

JANUARY 13, 1964

The 697th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, January 13, 1964, in Agee Hall, HSPA.

Members present: Abramovitz, Beardsley, Bess, Chong, Chûjô, Clagg, Davidson, Davis, Hardy, Harrell, Holzapfel, Huang, Gressitt, Joyce, Kamasaki, Krauss, S. Mitchell, W. Mitchell, Nakata, Pemberton, Rutschky, Sherman, Shiroma, Steiner, Suehiro, Tamashiro, Tsuda, Voss, Wilson, Yoshimoto, and Yukawa.

Visitors: Dr. Walter Steiger and Dr. Richard Hansen, astrogeophysicists of the University of Hawaii and Haleakala Observatory, Maui; Mrs. Richard Hansen; Robert Nave, Plant Quarantine Service.

Mr. Heber F. Thornley was unanimously elected to membership in the Society.

Because of the anticipated increase in the cost of printing the Proceedings, the Executive Council voted to increase the price of the Proceedings from $5.00 to $5.50 per copy.

Drs. Steiger and Hansen discussed the *Nysius* problem at Haleakala Observatory. During warm, still, dry days, *N. coenosulus* Stål swarms abundantly across the path of instrument rays, distorting the readings on the coronograph, thus making their program completely impossible. As *Nysius* is known to be blown to high altitudes on all the islands and to breed on weeds at various altitudes and in flower heads of *Dubautia,* in particular, which is the dominant composite in the vicinity of the Observatory, Dr. Hansen inquired as to the feasibility of a mass eradication program. This was considered to be impractical, but localized treatment of areas of heavy infestation may be possible. It was the general opinion of members that investigations to determine the migration of the bugs with correlative information on temperature, humidity, wind direction, air currents, etc. at the Observatory and breeding habits of *Nysius* must be made. In this connection, it was suggested that trapping by Bishop Museum personnel be carried out and ecological studies made by interested parties. As no immediate solutions were available, the problem was referred to a committee which will be in touch with Dr. Steiger.

Dr. Beardsley proposed the name of Professor C. P. Clausen, now retired from the Citrus Experiment Station, University of California, Riverside, for honorary membership. It was carried unanimously by the Society.

Members who attended the recently held meetings of the Entomological Society of America in St. Louis reported on the sessions that they attended.

Notes and Exhibitions

Bishop Museum Notes: Dr. J. L. Gressitt reported that Bishop Museum now has an extensive expedition in the Solomon Islands. R. P. Temple and R. Shanahan will carry on until the end of March, when they will be joined by J. Sedlacek and R. Straatman. Sedlacek has just been to Portuguese Timor and Straatman is in New Caledonia and will go to the Solomons via New Hebrides.

Six men are still participating in Antarctic field work and will be returning in March or April.

The large University of California Galapagos expedition and symposia are under the direction of Dr. Usinger. Peter D. Ashlock is representing Bishop Museum on the expedition.

The following notes were presented by Mr. Krauss.

Pseudococcus obscurus Essig: This mealy bug, determined by J. W. Beardsley, was collected on flowers of the firebush (*Myrica faya* Aiton) at Kokee, Kauai on March 9, 1963.

Euglandina singleyana (Binney): One live individual and several empty shells of this predacious snail of the family Oleacinidae were found at Goliad, Texas on August 14, 1963. The live snail was sent to Honolulu for study in the State Department of Agriculture quarantine insectary. It fed readily on the giant African snail (*Achatina fulica* Bowdich) in Honolulu but died after a few days.

Spissistilus festinus (Say): The membracid which has been known in Hawaii as *Stictocephala festina* (Say) was made the type of the new genus *Spissistilus* by John S. Caldwell [Proc. U.S. Nat. Mus. 98(3234): 513–514, 1949]. This species was incorrectly recorded as *Spissistilus festina* (Say) [Proceedings[1] 17(3): 315, 1961].

Brochymena quadripustulata (F.): Many specimens of this pentatomid bug were found in storage areas at the Masao Kaneshiro farm at Lualualei, Oahu by Sueki Yamamoto, Crop Reporting Service, State Department of Agriculture, in December 1963. This is just one year after its first discovery at the same farm. Searches for it in the warmer months have been unsuccessful; during these warmer months it probably occurs on plants in the fields and waste lands.

Tarophagus proserpina (Kirkaldy): Outbreaks of the taro leafhopper were observed in Waiahole Valley, Oahu in November and December 1963 by C. J.

[1] Throughout this publication, "Proceedings" refers to Proceedings of the Hawaiian Entomological Society.

Davis and James Kim, in Waimea Valley, Kauai in December by Stephen Au, and in Waipio Valley, Hawaii in December 1963 and January 1964 by Ernest Yoshioka.

Teracola plagiata Walker: An adult specimen, submitted by Dr. A. A. LaPlante of Guam Department of Agriculture, has been tentatively identified as this noctuid moth by Dr. Beardsley. This species is reported by Dammerman (AGRIC. ZOOL., MALAY ARCHIPELAGO, 1929) as a pest of banana, citrus, tobacco, rubber, and castor bean in Malaya. It is widely distributed in the Pacific from India and Malaya to New Guinea, Fiji, and Samoa, but has not previously been recorded on Guam. Dr. LaPlante reported larvae to be "group feeders" on squash and wing bean.

Eublemma anachoresis (Wallengren): Dr. Beardsley reported that he had reared specimens of this noctuid moth from larvae collected in terminal buds of *Waltheria americana,* at Mapulehu, Molokai, during August 1963. This is a new island record.

Tachinid eggs on Australian mantis: Dr. Beardsley reported that he had collected an adult female of the Australian mantis, *Tenodera australasiae,* at his home in Aina Haina, Honolulu during December 1963 which had two tachinid eggs, apparently of *Trichopoda pennipes* (F.), on its head. The mantis was held in the laboratory, but died after about one week in captivity, and no parasites emerged from the dead mantis.

CDC miniature light trap: Dr. Joyce exhibited a portable, battery-operated miniature light trap, designed to trap insects alive. Field tests have shown its success in collecting live mosquitoes for virus isolation studies.

Damage by Coptotermes formosanus Shiraki: Mr. Clagg reported that a power failure in the runway lighting system at the Marine Corps Air Station, Kaneohe, Oahu was found to be caused by damage to the insulation by the Formosan subterranean termite (*C. formosanus* Shiraki). Investigation showed that the termites had built a large branch nest in the underground manhole nearest the point of cable failure. Mud tubes had been built up to the top of the concrete manhole and also along the inside of the cement-asbestos underground ducts joining the manholes through which the wiring is drawn. The manholes are about 75 feet apart, and the mud tubes extended to the second adjacent manhole, a distance of 150 feet. The only damage noted was about 20 feet from the branch nest where a short circuit had burned out the insulation. The cement-asbestos ducts had so much mud filled in by the termites that it was necessary to use a truck to pull out the damaged cable. The nest was carefully dug out in the hopes of locating secondary queens but only thousands of workers and soldiers were found. There is a crushed rock drain in the bottom of each manhole through which the termites probably entered. No sign of wooden form boards could be seen where a colony might start nearby so it is believed the main colony may have started 250 feet away. The first reported damage by *C. formosanus* in Kaneohe was in 1954.

Mr. Clagg read a letter from Dr. F. J. Gay, C.S.I.R.O., Canberra, Australia, concerning termite attack on plastic cable sheathing and insulation and on plastic water piping.

Orthodera burmeisteri Wood-Mason: Miss Chong exhibited adults and ootheca and reported that the State Department of Agriculture recently received this determination from A. B. Gurney of the U.S. National Museum. This small mantid was reported for the first time in September 1962 [PROCEEDINGS 18(2): 213, 1962] when one adult specimen was taken in a light trap in Waipio, Oahu, and again in September 1963 when five adults were collected on a castor bean plant in Ewa, Oahu. It was first described from New Guinea and is now established in Queensland, Australia, also.

Mirax sp.: Miss Chong exhibited specimens of this new braconid parasite belonging to the genus *Mirax,* and reported that it was found established on Oahu recently. Specimens were reared from the lepidopterous leafminer, *Parectopa marginistrigata* Walsingham, on ilima collected in Honolulu in 1961 and 1963. According to C. F. W. Muesebeck, who made the determination, no species of *Mirax* has been described from the Pacific.

FEBRUARY 10, 1964

The 698th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, February 10, 1964, at the HSPA.

Members present: Anderson, Beardsley, Bess, Chong, Chûjô, Clagg, Davidson, Davis, Delfinado, Dyson, Garcia-Martell, Gressitt, Haramoto, Hardy, Holzapfel, Joyce, Kajiwara, Kamasaki, Kim, Krauss, Leong, Maehler, S. Mitchell, W. Mitchell, Nakata, Nishida, Pemberton, Perkins, Ozaki, Quate, Rodriguez, Rutschky, Samuelson, Sherman, Shiroma, Steiner, Sugerman, Tamashiro, Thistle, Tsuda, Voss, Wilson, Woolford, Yoshimoto, and Yukawa.

Visitors: Amroong Dipapal, V. K. Ganesalingam, James Hiramoto, Carl B. Huffaker, F. A. Johnston, Aye Aye Khaing, Satoru Miyazaki, W. Steiger, T. W. Suman, Elizabeth A. Thomas, Leon Ngeltur.

Dr. Roy T. Cunningham was unanimously elected to membership in the Society.

In connection with the *Nysius* problem at Haleakala Observatory, Mr. Tsuda gave a preliminary report on the air dispersal studies conducted by John Harrell and himself, each for a period of one week. Wind-stock trapping nets were set up at nine different sites to determine whether or not *Nysius* bugs were blown in from a great distance from the Observatory. Their observations and data recorded indicated that wind-blown insects affected the Solar Observatory problem only to a small degree. Dr. Beardsley made ecological investigations and reported the presence of two species of *Nysius* at the summit area, their preferred host being *Dubautia* plants. He concurred with the results obtained by Mr. Harrell and Mr. Tsuda that the insects were not blown in but originated

from a local population associated with *Dubautia* plants in the vicinity of the Observatory. It was suggested that this area be sprayed with 0.5 DDT emulsion, wettable powder suspension, with a heavy residual effect, on a trial basis. Further investigations and recommendations will await results of the spraying program now being carried out.

Mr. Maehler reported the death of Mr. Richard Faxon, former Plant Quarantine Inspector-In-Charge, U.S.D.A., Honolulu and a member of our Society, who died at the age of 80 at his home in Elyria, Ohio, September 9, 1963.

Dr. Carl B. Huffaker, Professor of Insect Ecology and Biological Control, University of California, gave an interesting talk, illustrated with slides, on the biological control of the olive scale by *Aphytis.*

Notes and Exhibitions

Clavaspis herculeana (Doane and Hadden): Dr. Rutschky collected two mature females of this diaspidid scale from a twig bearing a mature green macadamia nut, on December 13, 1963, in a commercial orchard at Honokaa, Hawaii, at an altitude of 900 feet. This is the first locality record of the scale in the islands.

This scale was first reported in Hawaii by E. Shiroma at the January 13, 1963 meeting. It had been intercepted May 18, 1963 by R. Wakamiya on the bark of an outgoing shipment of *Plumeria,* the source locality of which was unknown. G. F. Ferris (Atlas of the Scale Insects 2, 1938) states that the range of *Clavaspis herculeana* includes Florida, Cuba and the Society Islands, with a questionable record from Texas. It has been seen on *Anona, Cinnamomum, Maclura, Spondias, Lonchocarpus* and *Mangifera* in Cuba. The scales secrete themselves beneath the bark, making observation and collecting difficult. Scales were identified by Dr. Beardsley.

The following notes were presented by E. Shiroma.

Ischnaspis longirostris (Signoret): Several specimens of this black thread scale were intercepted on coffee berries by inspectors Alden Paterson and Robert Townsend on December 29, 1963 and January 14, 1964. On the latter interception, the passenger revealed that the berries were picked on the island of Maui. This constitutes a new host record for this scale and also a new island record for Maui, since it has been previously reported as occurring only on the islands of Oahu, Molokai, and Niihau. Other previously reported hosts are coconut, *Ficus bengalensis,* mango, *Moraea bicolor,* palm, *Pandanus,* star jasmine (Insects of Hawaii 5: 407, 1948) and *Chrysolidocarpus lutescens* (Proceedings 14: 17, 1950).

Hercinothrips femoralis (Reuter): An unusually heavy infestation of this thrips was noticed on spider lily plants *(Hymenocallis littoralis)* at the Honolulu International Airport. The immediate signs are bronzing and reddening of the younger leaves which later die. The infestation is so heavy that already several plants have been killed.

Gynaikothrips ficorum Marchal: Mr. Shiroma exhibited banyan leaves infested with this thrips and reported that during the latter part of January 1964, Inspector Norman Kitazaki showed him young leaves of a banyan tree *(Ficus retusa)* at the Honolulu International Airport which showed signs of insect injury. Upon examination of a few leaves, he found it heavily infested with a thrips which was identified by Mr. Sakimura of the Pineapple Research Institute as *Gynaikothrips* sp., most likely *ficorum* Marchal. Other trees are apparently infested with this same thrips in the Kalihi area. This constitutes a new insect record for the state of Hawaii. According to Sakimura, the distribution of this thrips is practically worldwide and is host specific to *Ficus retusa.* This thrips also occurs in the southern United States as far west as California.

Mr. Krauss presented the following notes.

Philaenus spumarius (L.): Ernest Yoshioka reported a heavy infestation of this cercopid on about a one-half acre of Hamakua pamakani plants *(Eupatorium riparium)* at Honomalino, Kona, Hawaii in September 1963 which was noted by Akira Kawasaki and Shoji Kawahara of the State Department of Agriculture. There were from 10 to 20 of the spittlebugs per plant and the frothy substance produced by the nymphs was quite conspicuous. They appeared to be feeding principally on the young shoots, and caused a noticeable wilting. In November, a moderate infestation was observed on Hamakua pamakani just beyond Kulani Prison, Hawaii, in the vicinity of the plum orchard.

Xylosandrus compactus (Eichhoff): This scolytid was found in a live branch of Isabella grape on Puna St., Kamehameha Heights, Honolulu in December 1963. A number of bostrychids, *Xylopsocus castanoptera* (Fairmaire), was also found in the branches.

Nezara viridula smaragdula (F.): Mr. Krauss reported that great numbers of nymphs and adults of the southern green stink bug on buds and flowers of night-blooming cereus *(Hylocereus undatus)* were seen in Manoa Valley, Honolulu early in the summer of 1963 by Miss Beatrice Krauss. Many of the flowers were ruined.

Insects on MATS plane: Mr. Clagg noted that about 15 minutes after departure from Midway January 31, he caught one drosophilid at the window and about 35 minutes later found a weevil, probably *Sphenophorus venatus vestita,* crawling in the aisle. There was a single fly, apparently *Phaenicia sericata* (Meigen), flying about but he was unable to catch it. The plane was not sprayed after leaving Midway or before arrival at Hickam, as far as he knew.

Ticks parasitic on albatross: Mr. Clagg reported a few ticks on nesting material of *Diomedea immutabilis* (Laysan albatross) but they were more commonly found on nesting materials of *D. nigripes* (black-footed albatross). Material from nests of both species of albatross were put through a modified Berlese funnel, loaned by the Bishop Museum, and many Collembola and mites and three ticks were collected.

Mumetopia nigrimana (Coquillett): Dr. Hardy reported that a large series of this anthomyzid fly was collected sweeping grass beneath *Datura* bushes, Kamuela, Hawaii, June 1963; one specimen was collected sweeping vegetation at Pupukea, Oahu, August 1963 by Hardy; and one specimen was collected at light, Honolulu, Oahu, February 1964, by Mitchell. This is a new record for Hawaii. This species is common in the Neotropical region.

Dacus dorsalis Hendel: Mr. Maehler noted seeing *Dacus dorsalis* on cannonball flowers at Foster Gardens recently.

Aedes vexans nocturnus (Theobald) on Molokai: Dr. Joyce reported collecting numerous larvae and pupae of this immigrant floodwater mosquito from a grassy pool in a roadside park near the Kapuiwa coconut grove not far from Kaunakakai, Molokai, on December 16, 1963. The next day, 11 pupae were taken from old tires near Kaunakakai Harbor. Although not a normal habitat for the mosquito this finding indicates that it is possible for the species to be transported from one place to another in the dry egg stage in old tires. Four *A. nocturnus* pupae were also taken from a concrete-lined sump about a mile east of Kaunakakai, which was producing great numbers of *Aedes aegypti* and *A. albopictus*. *A. nocturnus* is now present on the three islands of Oahu, Kauai, and Molokai and appears well established [Joyce and Nakagawa, PROCEEDINGS 18(2): 273–280].

Sarcophagula occidua (F.): During the week of December 16-21, Dr. Joyce took large numbers of this sarcophagid fly in fly traps at Kaunakakai, Molokai, Kahului, Maui, and Nawiliwili, Kauai, indicating that it is well established on these islands. It was first taken on Oahu in September 1961 [Joyce and Wilton, PROCEEDINGS 18(1): 20–21]. It has apparently not been previously recorded from the other islands.

MARCH 9, 1964

The 699th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, March 9, 1964, in Agee Hall, HSPA.

Members present: Abramovitz, Beardsley, Bess, Chong, Chûjô, Clagg, Davis, Delfinado, Gressitt, Haramoto, Hardy, Holzapfel, Joyce, Kajiwara, Kamasaki, Kim, Look, S. Mitchell, W. Mitchell, Nakao, Nakata, Nishida, Ozaki, Rodriguez-Velez, Sherman, Shiroma, Steiner, Suehiro, Sugerman, Tanaka, Tsuda, Wilson, Woolford, and Yukawa.

Visitors: Amroong Dipapal, Aye Aye Khaing, T. W. Suman.

Mr. Davis reported that the Summary of Insect Conditions in Hawaii for 1963 has been completed and sent to Washington, D.C. and will appear in the current issue of the Cooperative Economic Insect Report.

Mr. Theodore W. Suman, of Bishop Museum, was unanimously elected to membership in the Society.

After a few introductory remarks by Mr. Steiner, an excellent movie on fruit fly mass production techniques by the local U.S.D.A. Fruitfly Laboratory was shown.

Notes and Exhibitions

The following notes were presented by J. W. Beardsley.

Gynaikothrips ficorum Marchal: This newly established immigrant thrips was found infesting Chinese banyan trees *(Ficus retusa)* at Honolulu Zoo, Waikiki, and at the abandoned Coast and Geodetic Survey Station at Barbers Point, during the first week of March. These records considerably extend the known range of this thrips on Oahu.

Trichopoda pennipes (F.) **parasitizing koa bugs:** During January and February, numerous adults and mature nymphs of the koa bug, *Coleotichus blackburniae* White, were collected at the State Park site on Tantalus on *Acacia formosana.* Several adults and a few nymphs bore eggs of the tachinid parasite *Trichopoda pennipes,* and two adult flies were subsequently reared from mature maggots which issued from parasitized koa bugs. *T. pennipes* has previously been reared from *C. blackburniae* in the laboratory, and adult bugs with parasite eggs attached have been collected in the field; however, this is the first record of field-parasitized bugs yielding adult flies.

Ceroplastes cirripediformis Comstock: The barnacle scale, *C. cirripediformis,* was collected on Molokai during December 1963 by Dr. Beardsley and on Maui, on passion fruit, in February 1964 by Dr. Nishida. These are new island records.

Insects in albatross nests: Mr. Clagg reported that C. S. Robbins, E. J. O'Neill, and E. Kridler, biologists with the Fish and Wildlife Service, are spending several months on research on the birds on the leeward islands of Hawaii, and are collecting specimens of parasites found on birds or in nests occupied by birds. They reported that in their collection so far of data on birds banded, they found six Laysan albatross *(Diomedea immutabilis)* that had been banded by an entomologist, Fred C. Hadden, in 1936. Mr. Hadden was sent to Midway by the HSPA in cooperation with Pan-American Airways to check the weekly trans-Pacific flying boats for possible insect immigrants and to prevent their introduction to Hawaii and the continental U.S. During his spare time, he banded many albatross. Mr. O'Neill said that the banding established the fact that these Laysan albatross were long-lived as it has been over 27 years since Mr. Hadden banded them. They usually do not mate and produce young until at least 5 to 7 years old so these albatross must be at least 32 years old.

As the Navy is interested in knowing if the pattern of bird strikes on their planes is determined by the nest location and habits of the birds, locations of nesting sites were plotted carefully to within a foot for future study.

Ornithodorus sp.: Dr. Wilson has identified the ticks from Kure Island as belonging to the genus *Ornithodorus.*

Trichopoda pennipes (F.): Mr. Davis reported that on March 2, 1964, a male of *T. pennipes* emerged from a pupa which had been recovered from the koa bug, *Coleotichus blackburniae* White, collected on Tantalus, and a female

Trichopoda emerged from a pupa which was recovered from a southern green stink bug that had been collected at Koko Head. These are the first recoveries of adults of this Florida tachinid since its release at Ewa on November 19, 1963.

On distinguishing characteristics of the West Indian and Florida species, Mr. Davis gave the following notes: "Taxonomists do not appear to be in agreement on these tachinids but there appears to be valid morphological and biological differences that would justify our calling the West Indian species as variety *pilipes*. For example, the abdomen of the male Florida species is consistently longer than the West Indian species and there appears to be considerable difference in the egg capacity of these two species. In five tests with each, the West Indian variety averaged 171.4 eggs while the Florida tachinid averaged 105.6 eggs. To date we have been unable to obtain progeny by crossing the two species."

The following notes were presented by Dr. Hardy for Dr. M. Sasakawa of Kyoto Prefectural University.

Phytobia (Amauromyza) maculosa (Malloch): 28 males and 27 females were reared from larvae on *Erechtites valerianaefolia* at Hilo, Kolekole Park, and Kilauea National Park, Hawaii and at Tantalus, Oahu, October-November 1962. A male and a female were reared from *Emilia sonchifolia* at Hilo, Hawaii.

Pseudonapomyza spicata (Malloch): 7 males and 21 females were reared from *Stenotaphrum secundatum* (Walk.) Kuntze, at MacKenzie State Park, Hawaii, October 1962. All are new host records. Plants were determined by Miss M. Neal of Bishop Museum.

Thoracaphis fici (Takahashi): Mr. Kim exhibited specimens and reported that a heavy infestation of this banyan aphid was observed on *Ficus benghalensis*, the large banyan tree at King and Keeaumoku streets. Associated with the aphids is the sooty mold fungus which covers a large portion of the tree. Together these two agents are responsible for the poor condition of the tree, and not poisoning from herbicides which was suspected to be the cause.

Gynaikothrips ficorum Marchal: It was reported by Mr. Kim that this thrips, first observed by inspectors Shiroma and Kitazaki of the Federal Plant Quarantine office on *Ficus retusa* in the Kalihi area, was abundant recently on *Ficus benjamina*. On February 7, 1964, it was observed on *Ficus retusa* in the Nuuanu Tunnel area, and this is the first report of this pest on the windward side.

Brochymena quadripustulata (F.): Dr. Mitchell reported that three live adults of this insect were collected among boards and packing material in a shed on Kaneshiro's farm, Lualualei Valley, on February 13, 1964, the original site of infestation. The adults would not feed in the laboratory on immature stink bugs or dipterous or lepidopterous larvae, but did feed on fresh string beans.

Trialeurodes vaporariorum (Westwood): Dr. Mitchell reported that farmers are having difficulty with high populations of whitefly, *T. vaporariorum* on pole beans in the Waianae and Kahuku areas.

Parthenothrips dracaenae (Heeger): Mr. Rodriguez-Velez reported that the different stages of this phytophagous thrips were found on the foliage of croton *(Codiaeum variegatum)* at Hana, Maui on February 26, by Dr. Nishida and Mr. F. Haramoto. Determination was by Mr. Sakimura and this constitutes the first record for the species on Maui, and a new host plant for the State.

A chemical attractant for Diptera: Mr. Sakimura reported that Dr. Robert W. Leeper, chemist at Pineapple Research Institute, recently observed accidentally that 1,2,3,4-tetrahydroquinoline is a powerful lure for *Lathyrophthalmus arvorum* (F.). Previously, the same fly was reported by Van Zwaluwenburg to be highly attracted to iso-amylamine (PROCEEDINGS 11: 5, 1941), and by Fullaway and Krauss to cyclohexylamine (COMMON INSECTS OF HAWAII, 153, 1945). According to the chemist, these three chemical compounds all contain a common ingredient of amino nitrogen.

Araeocorynus cumingi Jekel: Mr. Shiroma reported that this anthribid has been picked up by Federal Plant Quarantine inspectors on four occasions: once in *Mucuna* sp. seeds taken to the mainland and sent back because of the infestation, August 25, 1963, twice November 13, 1963, and February 20, 1964, with clothing in baggage leaving Hawaii. The fourth time was on November 24, 1963, when four specimens were found by John Wuotila on his window screen in his Ewa beach home. No other specimens were found although an intensive search was conducted, and these four specimens presumably emerged from some seed beads bought in Laie, Oahu.

Whether this anthribid is established on Oahu is not yet known as the seed beads may have been imported from elsewhere. However, all interceptions on the mainland are from seed beads bought in the State and, in Mr. Wuotila's case, from a bead shop in Laie, Oahu. This may confirm Miss Chong's report of September 1963 of a new insect for Hawaii.

APRIL 13, 1964

The 700th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, April 13, 1964, in Agee Hall, HSPA.

Members present: Anderson, Bianchi, Chong, Chûjô, Davidson, Davis, Fullaway, Funasaki, Gressitt, Harrell, Hart, Joyce, Kajiwara, Kim, Krauss, Look, Nakao, Nakata, Pemberton, Perkins, Quate, Ross, Samuelson, Sherman, Shiroma, Steiner, Suehiro, Sugerman, Thistle, Tsuda, Wilson, Yoshimoto, and Yukawa.

Visitors: Peter D. Ashlock, Keith A. J. Wise, John C. Boyd, and Raymond R. Forster, all affiliated with the Bishop Museum; Mrs. D. T. Fullaway; Harry D. Pratt of Communicable Disease Center, Public Health Service, Atlanta, Georgia and Vice-President of Section D (Medical and Veterinary Entomology) of Entomological Society of America.

Miss Aye Aye Khaing, student at the East-West Center, was unanimously elected to membership in the Society.

Mr. Sugerman reported for the Science Fair Committee that the $10.00 wish award for the best exhibit in Entomology at the Seventh Hawaiian Science Fair was presented to Miss Aileen Chong, St. Francis Convent School, for her project entitled "Effects of radiation on the fruit fly."

A letter from Dr. S. Pradhan, President of the Entomological Society of India noted the observance of its Silver Jubilee in April. It was voted to send a letter of congratulations and a message of good will from our Society.

Mr. Davis read a letter from Mr. K. Dorward, Chief Staff Officer of Survey and Detection Operations, USDA, Hyattsville, Maryland, which reported that the Summary of Insect Conditions in Hawaii for 1963 will appear in the Cooperative Economic Insect Report, Vol. 14 (2): 220–223. He also called attention to the following changes: Dr. E. L. Todd reports *Otosema odora* a synonym of *Ascalapha odorata* (L.) (see OITICICA, ARQUIV. MUSEU NACIONAL 52: 137–144, 1963). Miss R. Warner records that *Otiorhynchus cribricollis* is changed to *Brachyrhinus cribricollis. Stomorhina pleuralis* is now a synonym of *Rhinia apicalis* (Wiedemann), according to Dr. C. W. Sabrosky.

Mr. Bianchi gave an interesting account, illustrated with colored slides, of his entomological explorations in Micronesia. Particular reference was made to the search for parasites of the sugarcane weevil borer, *Rhabdoscelus obscurus* (Boisduval).

NOTES AND EXHIBITIONS

The following notes were presented by Mr. Krauss.

Onthophagus catta (F.): This dung beetle was found in goodly numbers in cow dung at Mapulehu, Molokai, on March 31, 1964, the first record for Molokai. It has been reported from various localities on Oahu. The beetle was purposely introduced from Africa in 1957 to aid in control of the hornfly, *Siphona irritans* (L.).

Eupatorium riparium insects: Hamakua pamakani, an aggressive composite weed pest on cattle ranches in Hawaii, is native to Mexico and Mr. Krauss observed it there at two places: in a thick coniferous forest at the Desierto de Los Leones, Distrito Federal, about 8,000 to 8,500 feet, and at Cuernavaca, Morelos, about 5,000 feet. In both places it was growing near small streams in barrancas (canyons). Small young flower buds were seen on the plants in December and the flowering occurs from January or February into April. Mr. Krauss also saw the plants at Nuwara Eliya, Ceylon (5,200 feet) and Monte, Madeira (Krauss, Bocagiana, Museum Municipal do Funchal, November 9, 1963, p. 1).

The following insects were collected at the Desierto de Los Leones. Identifications were made by the Entomology Research Division, U.S. Dept. of Agriculture.

Proba sallei (Stål) (Hemiptera, Miridae), April 1956, on plants.
Phytocoris sp. (Hemiptera, Miridae), April 1956, on plants.
Empoasca sp. (Homoptera, Cicadellidae), June 1955.
Tychius sp. (Coleoptera, Curculionidae), March 7, 1961, swept from plants.

Oidsematophorus sp. (Lepidoptera, Pterophoridae), December 1959, larvae feeding on leaves.

Hysterosis sp. (Lepidoptera, Noctuidae), December 1961, greenish larvae feeding on leaves.

Phytobia (Calcomyza) allecta (Melander), December 1960 and December 1961, *ex* mines in leaves. This species is also known from Canada, the eastern and central United States and the West Indies. It mines leaves of *Bidens, Helianthus,* and *Rudbeckia.*

Lasioptera sp. (Diptera, Cecidomyiidae), March 1961, reared from flowers.

Paroxyna sp., probably undescribed (Diptera, Tephritidae), March 7, 1961, adults resting on flower heads. Possibly no connection with this plant.

A fungus, *Cercospora perfoliata* Ell. and Ev., determined by the National Fungus Collections, U.S. Department of Agriculture, was found on the leaves on December 13, 1959.

The following notes were presented by Mabel Chong for Ernest Yoshioka of Hilo, Hawaii.

Pseudococcus obscurus Essig: Moderate to heavy infestations of the mealybug, *P. obscurus,* were observed in March 1964, on papaya fruits throughout Kapoho, Hawaii where nearly 30 acres of one farm were infested. Damage appeared as uneven ripening of the fruits in addition to a stem-end rot caused indirectly by the mealybugs. This appears to be the first record of this mealybug for the island of Hawaii. Specimens were identified by J. Beardsley.

Pseudaletia unipuncta (Haworth): A severe outbreak of the armyworm was observed in makai paddocks near the old Kamuela CCC camp, Hawaii, on April 8, 1964. The Kikuyu grass appeared completely brown. Six larvae were collected in a one-square-yard area in the fringe of the armyworm path, and four cocoon clusters of the braconid parasite, *Apanteles militaris* Walsh, and 12 larvae affected by the nuclear polyhedrosis virus were found in the area.

Xylosandrus compactus Eichhoff: Mr. Kim reported that surveys for the coffee twig borer, *X. compactus,* shows that it is established in Nuuanu, Manoa, Kaneohe, Ewa, Kahaluu, Kalihi, and Aina Haina. Heavy infestations have been observed at several orchid nurseries during the past month. Damage is generally confined to the older canes of *Dendrobium* hybrids; however, where an infestation has been unchecked, especially if the spray program has been neglected, younger canes may be attacked. Many of the growers were unaware of the beetles in their orchids. Infested canes usually do not flower and if they do, the flower sprays are weak and malformed. Natural offsets and new growth from the attacked canes may not develop. Damaged canes were found to contain all stages of the beetle, numerous exit holes, and soft, rotted, and necrotic areas in the pith. Signs of *Xylosandrus* were also observed on *Epidendrum* and *Vanda joaquim* stems but no specimens were recovered. Infestations were also confirmed on the asparagus plant, *Asparagus myriocladus.*

Gynaikothrips ficorum Marchal: Infestations of the Cuban laurel thrips were recently observed in both Kailua and Lanikai areas on *Ficus retusa* by Mr. Kim. The following is an excerpt of a letter from Mr. Ronald M. Hawthorne, Survey Entomologist of California to Mr. C. J. Davis: "The Cuban laurel thrips, *Gynaikothrips ficorum* was originally discovered in San Diego in 1959. Hosts infested were *Ficus retusa, Ficus nitida, F. benjamina, F. thonningii* and *F. petiolaria.* The common host here is *F. retusa.* This thrips now occurs in San Diego, Orange, Los Angeles, Riverside, Ventura, and Santa Barbara Counties. It is fairly widespread in most of these counties. Rolled leaves make treatment difficult. Malathion, dieldrin and cygon have been used at 1:800 with good results. This species was confused with *G. uzeli* when *G. ficorum* was first found."

Vanessa tameamea Eschscholtz: Specimens of the Kamehameha butterfly, *V. tameamea,* were exhibited by Mr. Davis for the benefit of visitors and newer members of the Society who may not have had the occasion to see this beautiful native nymphalid. Most of the specimens were reared from caterpillars collected at Kilauea, Hawaii on mamake (*Pipturus* sp.), the principal native host, between January and March of this year.

MAY 11, 1964

The 701st meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, May 11, 1964, in Agee Hall, HSPA.

Members present: Anderson, Beardsley, Bianchi, Chong, Chûjô, Clagg, Delfinado, Fujimoto, Fullaway, Gressitt, Haramoto, Hardy, Harrell, Harris, Hart, Holway, Holzapfel, Kajiwara, Look, S. Mitchell, W. Mitchell, Nakao, Nakata, Ohinata, Pemberton, Quate, Rutschky, Samuelson, Sherman, Shiroma, Suehiro, Sugerman, Suman, Tsuda, Voss, Wilson, Woolford, Yoshimoto, and Yukawa.

Visitors: Junichi Aoki, Peter D. Ashlock, Raymond Forster, K. A. J. Wise, James Hiramoto, Leon Ngeltur, Elizabeth Thomas.

Peter D. Ashlock, Raymond R. Forster and Neal R. Spencer were unanimously elected to membership in the Society.

The members voted unanimously to retain membership in the Conservation Council of Hawaii and to pay the annual dues of $5.00 for 1964.

On behalf of the New Zealand Entomological Society, Mr. Wise expressed its greetings and will transmit our good wishes to members of that society upon his return to New Zealand.

Dr. Rutschky, from Pennsylvania State University, who has been Visiting Professor in Entomology at the University of Hawaii for the past year and a half expressed his appreciation and Aloha to the membership.

Dr. L. W. Quate, who spent 16 months in the Sudan to do field studies on man-biting *Phlebotomus* sandflies in collaboration with NAMRU 3, presented an interesting talk on "Kala-Azar in the Sudan."

Notes and Exhibitions

Dr. Beardsley presented the following four notes and exhibited specimens.

Nysius caledoniae Distant: Specimens of a *Nysius* species new to the Hawaiian Islands, which have been determined provisionally as *N. caledoniae* Distant, were collected by Dr. Beardsley at several localities on Oahu, during April. The species was discovered at Ewa on April 23 and was subsequently collected on the University of Hawaii campus, near Wahiawa, and at the University's Poamoho Experimental Farm. The bugs have been taken from flower heads of several common weeds of the family Compositae: *Emilia sonchifolia, Erigeron canadensis, Pluchea indica, Sonchus oleraceus,* and *Verbesina encelioides.* Both adults and nymphs were present in numbers on *Erigeron* and *Sonchus.* In several instances populations were mixed with those of *Nysius kinbergi* Usinger.

Determination was made through reference to literature and through comparison with specimens in the HSPA collection from Guam, determined as *N. caledoniae* by R. L. Usinger. *N. caledoniae* was described from specimens collected in New Caledonia (Ann. Mag. Nat. Hist. IX, 6: 151, 1920) and has been reported from the Bonin, Mariana, Caroline, and Marshall Islands [Barber, 1958, B. P. Bishop Mus., Ins. Micronesia 7(4): 181] The new immigrant *Nysius* can be distinguished from all other Hawaiian species by the development of the bucculae on the underside of the head. In *N. caledoniae* these structures are relatively strongly elevated throughout their length, and terminate abruptly near the base of the head. In other Hawaiian *Nysius* these structures are narrower, and usually shorter, gradually tapering posteriorly, and usually terminate well before the base of the head.

It is of interest that this is apparently the first immigrant species of *Nysius* to become established here within historical times, and others may well follow. The notorious Rutherglen bug of Australia, *N. vinitor* Bergroth, is apparently established on Canton Island, and is also recorded from Western Micronesia and the Philippine Islands. Other pest species are present in western North America. It is altogether possible that *N. caledoniae* itself could become a pest here.

It will be of considerable interest to see what effect the new immigrant *Nysius* will have upon the abundance and distribution of the native Hawaiian *Nysius* which have similar host preferences.

Aspidiotus selangorensis Williams and Hall: This diaspidid scale, recently described from specimens collected in Malaya [Brit. Mus. (N.H.) Ent. Bull. 13(2): 35, 1963] on *Adiantum fergusoni* (Polypodiaceae) has apparently been established on Oahu for several years. Specimens collected on Mt. Tantalus, Oahu, October 1958, on the fern *Cyclosorus dentatus,* and previously considered to be an undescribed *Aspidiotus* agree very closely with the description and figure of *A. selangorensis.* This is a new insect record for the State. The determination was made by Dr. Beardsley.

Cryptophlebia ombrodelta (Lower) **larvae damaging ornamental shade trees:** On April 15 an investigation was made in response to complaints received from two residents of Alii Shores Subdivision, near Kaneohe, concerning damage by boring insects to young ornamental trees. Two small rainbow shower trees *(Cassia),* and one small fern tree, *(Filicium decipiens)* were found to have been severely damaged by larvae of *C. ombrodelta.* The larvae confined their attack to boring within young terminal growth, and killing numerous young twigs on the affected trees. Older woody growth was not affected.

Titanochaeta bryani Wirth: Specimens were exhibited of this unusual endemic drosophilid fly which had been reared from the egg sac of an unknown spider of the family Thomiscidae. The flies were determined by Dr. Hardy, and Mr. T. Suman examined spiderlings which issued from one of the several egg cases collected. The egg cases were fairly numerous on the leaves of *Freycinetia arborea* at the summit of Wiliwilinui Ridge, Oahu, on April 19, 1964. Of the egg cases collected by Dr. Beardsley, eight yielded only spiderlings, four contained from four to seven empty fly puparia, one contained a single empty puparium and several spiderlings, and one yielded seven sound puparia from which the flies exhibited later emerged.

The genus *Titanochaeta* is endemic to the Hawaiian Islands and contains the only drosophilids known to prey upon spider eggs. No specific host records have been published for these flies, although they have been reported several times as "reared from spider egg cases." A reference by Kirkaldy (HSPA EXPT. STA. ENT. DEPT. CIR. 7: 7, 1908) to *"Leucopis"* flies parasitizing the eggs of the thomiscid spider *Pagiophalus atomarius* Simon may actually have involved a species of *Titanochaeta.*

Circulifer tenellus (Baker): For E. Yoshioka, Miss Chong reported that several specimens of the sugar-beet leafhopper were found on a species of *Atriplex* at Kawaihae, Hawaii, on January 23, 1964. This is a new island record for this leafhopper which had been collected previously on Oahu, Molokai, and Kauai. Identification was confirmed by J. P. Kramer of the U.S. National Museum.

Winthemia sp. (**diversoides** Bar.?): Miss Chong reported that the tachinid fly introduced from New Guinea in 1963 for the possible control of *Achaea janata* (L.) and *Anacamptodes fragilaria* (Grossbeck) has been identified by C. W. Sabrosky at the U.S. National Museum as *Winthemia* sp. (*diversoides* Bar.?), possibly a new species. It was provisionally identified in 1963 as *Eucelatoria armigera* (Coquillet).

Subterranean termite on Guam: Mr. Clagg reported that a termite, apparently different from *Coptotermes formosanus* Shiraki or *Prorhinotermes inopinatus* previously known from Guam, was found within 100 yards of the edge of Apra Inner Harbor. Nearly 1000 specimens, mostly workers, soldiers, and a few nymphs, were removed from a wooden box on the ground. These termites have two sizes of soldiers. The species has not been identified as yet.

Dr. Gressitt reported that a preliminary check on the partial lot of specimens received and collected on Bird Island, South Georgia by Harry Clagg, who has spent nearly 20 months there, shows about 50 percent increase in the number of species to be added to the known fauna. This, plus collections made by J. Boyd on Navarino Island, Tierra del Fuego, will be of great interest and significance in current studies of the Antarctic–Subantarctic terrestrial arthropod fauna.

Culex tritaeniorhynchus Giles **and Mansonia (Mansonioides) uniformis** (Theobald) **on Guam:** Captain Holway reported that both of these species of mosquitoes are apparently well established on Guam, Mariana Islands.

Damage to green coffee cherries: Dr. Mitchell exhibited green coffee cherries from the Koike farm, Kealakekua, Hawaii which were infested by some coleopterous insect. Each cherry had one to three small slitlike openings which were presumably made by the ovipositor of the females. Damaged cherries were found on the tree as well as on the ground, and infestation appeared to be localized. The coleopterous larvae dissected from the fruit were too small for identification. Samples of infested cherries are being held for future emergences.

Southern green stink bug: For Edward Fukunaga, Dr. Mitchell reported that stink bug damage to macadamia nuts in Kona, Hawaii, has increased from 0.7 to 13 percent in January–March this year. Experimental plots of tomatoes on Molokai have had 10 percent losses.

Clavaspis herculeana (Doane and Hadden): At the February meeting of this society Dr. Rutschky reported the presence of this diaspidid scale on a twig of macadamia at Honokaa, Hawaii, collected in December 1963. Since then another specimen has been found on green macadamia nuts collected November 8, 1963 at the Poamoho, Oahu, experimental farm of the University of Hawaii. Determination was confirmed by Dr. Beardsley. This report constitutes the first record for *Clavaspis herculeana* (Doane and Hadden) on Oahu.

The following three notes were presented by E. Shiroma.

Araeocorynus cumingi Jekel: On April 15, 1964 Eugene Ziegler found two specimens of this anthribid beetle in dry pods of maunaloa vine (*Canavalia microcarpa*) near Manoa stream at the bridge near the Fisheries Laboratory. Four specimens were found by Mr. Shiroma on April 19 and two more specimens by Mr. Ziegler on April 26. Although these beetles were found in the dry pods, no signs of feeding were present, and they were probably hiding or resting in the pods. No other host material could be found in the vicinity. This constitutes the first established locality record for this beetle in the State.

Carpophilus marginellus Motschulsky: A specimen of this nitidulid beetle was intercepted in quarantine on April 9, 1958 in a pomegranite fruit (*Punica granatum*) from Oahu, by Herbert Hannagan. On June 11, 1963, Benjamin Hu, Inspector in Charge of Hilo, Hawaii, intercepted a specimen with vanda flowers

from Hilo. This establishes the first locality records from the State. This beetle was first reported, without locality, by E. J. Ford [PROCEEDINGS 17(1): 8] in 1958. At that time Mr. Ford reported that although this beetle had been present in Hawaii for at least nine years, it had not been previously reported owing its resemblance to the other four species of *Carpophilus* known here.

Pseudaulacaspis major (Cockerell) Ferris: In the latter part of April, Mr. Shiroma noticed a willow tree (*Salix babylonica*) in the Honolulu Airport garden heavily infested with this scale insect. The tree was in poor condition with dying leaves and branches. On removal of the dead branches, it was noticed that the bases of every branchlet and leaflet were infested. This constitutes a new host record for this scale in Hawaii. Other hosts listed are litchi and longan (Zimmerman, INSECTS OF HAWAII 5: 381, 1948).

Nezara viridula smaragdula (F.): Mr. K. A. J. Wise recorded the presence of this stink bug on Christmas Island. One specimen was collected at the airport during a flight from New Zealand. The plane stopped at Tahiti for 30 hours then refueled at Christmas Island after an 8-hour flight. The specimen was taken at light some distance from the aircraft and though doubtful there is the slight possibility that it had been introduced on one of the passengers. It would be worthwhile for anyone visiting Christmas Island to check on the occurrence of the stink bug. The stink bug, known in New Zealand as the green vegetable bug, is well distributed throughout the Pacific, and is an important pest both in Hawaii and New Zealand. Specimens in the Bishop Museum collection are from Guam, Borneo, Okinawa, Taiwan, Saipan, Iwojima, Bonin, Mariana, Society Islands, Samoa, Tonga; it is also known in Fiji. Mr. Samuelson added that it is also present on Kermadec Is., situated midway between Fiji and New Zealand.

JUNE 8, 1964

The 702nd meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, June 8, 1964, at the HSPA.

Members present: Abramovitz, Ashlock, Beardsley, Bianchi, Carter, Chûjô, Davis, Delfinado, Dyson, Fullaway, Gressitt, Haramoto, Hardy, Hart, Holway, Kamasaki, S. Mitchell, W. Mitchell, Nakata, Nishida, Ozaki, Pemberton, Perkins, Quate, Rodriguez-Velez, Sakimura, Samuelson, Sherman, Shiroma, Suehiro, Suman, Tuthill, Woolford, Yoshimoto, and Yukawa.

Visitors: Junichi Aoki, Avelino F. Banaag, James Ikeda, Keizi Kiritani, Satoru Miyazaki and Elizabeth Thomas.

Junichi Aoki, K.A.J. Wise, and Robert Park were unanimously elected to membership in the Society.

Mr. Joel Rodriguez-Velez, who is returning to Mexico, gave a brief message of farewell to the members.

Dr. Walter Carter who returned to Hawaii for a short visit from Kingston, Jamaica, where he is affiliated with the Ministry of Agriculture and Lands, presented some interesting remarks on various aspects of his current work with a virus disease on coconut palms in Jamaica.

Notes and Exhibitions

Dr. Gressitt exhibited a portable Japanese fly trap which utilizes a special bait, primarily to attract muscoid flies.

Oribatid mites from Laysan Island: Dr. Junichi Aoki presented a brief taxonomic report on the oribatid mites of Laysan I., based on the collection at Bishop Museum. All of the eight species found are new records for the Hawaiian Islands, and include one new genus and five new species.

The following notes were presented by Dr. J. W. Beardsley.

New insect records for Hawaii: An examination of specimens in insect collections made by students of the general entomology course at the University of Hawaii during the past semester has revealed several new insect records for the State. Tentative determinations of the species involved were made by Dr. Beardsley unless otherwise stated. Specimens will be submitted to appropriate specialists for more complete determination.

Pselaphanca sp., possibly **lateritia** Fairmaire: Two specimens of an oedemerid beetle new to the State were found in the student collections, and a third, living specimen was later brought in by one of the collectors. Two of the three were taken at light in Waipio Acres subdivision near Wahiawa, during May and early June, by Ernest Funakoshi, while the third was taken at Wahiawa on May 10 by T. Shinsato. The beetles resemble the common *Anaca bicolor* Fairmaire in size and color, except that the pronotum is darker and more strongly coarsely punctate. The last segment of the maxillary palpus of the male is strongly excavate on its outer side, a feature characteristic of the genus *Pselaphanca.*

Paracyphononyx pedestris (Smith): Two female specimens of a spider wasp (family Pompilidae) new to Hawaii were found in the collections; one from Waianae, Oahu, 28 May 1964, M. S. Fujimoto, and one, University of Hawaii campus, Honolulu, 2 June 1964, A. Aloiau. One specimen was submitted to Dr. K. V. Krombein, U.S. National Museum, who states that it is the same as specimens from the Philippines identified as *P. pedestris* by Banks in 1934.

Hister coenosus Erichson?: Two specimens of a histerid beetle which appear to be the same as a specimen determined as *H. coenosus* (determiner not indicated) in the collection of the State Department of Agriculture, were found in student collections. One specimen was labeled Kalee, Molokai, March 30, 1964, R. Iwamoto, collector, and the second, Manoa (Oahu), April 20, 1962, Shoup, Collector. *H. coenosus* is reported to have been introduced by the State Department of Agriculture in 1952 from Puerto Rico for hornfly control, but has not previously been reported as established here. A single specimen of a larger histerid of the general type associated with cattle dung, etc., labeled Waipahu, Oahu, 15 March 1964, R. Shinsato collector, was also found in the student collection. This probably represents another species imported for hornfly control by the Department of Agriculture, although its identity is unknown.

Onthophagus sp. ?: A single specimen of a scarabaeid dung beetle taken at Waikii, Hawaii, March 27, 1964, by D. Segawa, apparently is another new record. The specimen appears to be identical with specimens of an undetermined *Onthophagus* from a lot released at Kamuela, Hawaii, on March 31, 1957, which were imported from Umtali, Rhodesia by the State Department of Agriculture.

Chrysobothis octocola Le Conte: A single specimen labeled "Gateway dormitory, University of Hawaii, March 14, 1964, Weeks collector," represents the first known collection of this immigrant buprestid beetle in the State since it was originally discovered in the Waianae coastal area in 1960 [PROCEEDINGS 17(3): 321].

The following notes were presented by Dr. Hardy.

Donaceus nigronotatus Cresson: One specimen of a new ephydrid from Hanakapiai Valley, Kauai, April 1964, D. E. Hardy, was determined by W. W. Wirth as *D. nigronotatus* Cresson. Wirth reports that the U.S. National Museum collection also has specimens from Iolekaa Valley, Oahu, July 1958, L. W. Quate, and from John Rodgers Airport, Oahu, May 1958, E. J. Ford, Jr. The species was described from Taiwan, and specimens are in the U.S. National Museum from Thailand, Okinawa, and Beak Island, New Guinea.

Telmatogeton abnormis (Terry): Dr. Hardy exhibited specimens of this species from rocks in stream, Hanakapiai Valley, Kauai. According to Wirth this is the ancestral form of fresh-water *Telmatogeton.*

Oscinella sp. ?: Specimens of this species, determined by Sabrosky, from coconut flowers, were also exhibited.

Mr. C. J. Davis reported the following for Ernest Yoshioka.

Nysius caledoniae Distant: This new immigrant lygaeid was reported seriously damaging vanda buds and blossoms at Kapoho, on May 6, 1964. Approximately 80 percent of the flowers in a quarter-acre planting were affected. Investigation disclosed that the bugs were being blown directly on the orchids from a heavy stand of sour bush *(Pluchea odorata)* and possibly *Erigeron* sp., which is also common in the area. There were no indications of breeding on vandas. Other plantings in the Puna District were not affected. By May 28, damage had greatly subsided and this was attributed largely to the removal of wild weed hosts and weekly applications of malathion.

This is the first record of economic damage caused by this pest and also the first record for the island of Hawaii. Specimens were identified by Mr. Peter Ashlock.

For James Kim, Mr. Davis reported the following.

Orius persequens (White): This predaceous bug of thrips and other soft-bodied insects was recently recovered from a heavy infestation of *Gynaikothrips ficorum* on *Ficus retusa,* the Chinese banyan, at Auwaiolimu Road in Pauoa. Recovery of the anthocorids was made each time thrips material was brought in. Various stages of nymphs and mature adults were observed.

Ananca kanack Fairmaire: This oedemerid beetle, exhibited by Mr. Davis and determined by Dr. Yoshimoto, was found on May 22, 1964 on the schooner Fiesta at Ala Wai Yacht Harbor. Mrs. Vitousek, who returned from the Line Islands during the latter part of last year, stated that this was the third live specimen she had found, and that the beetles must have been brought back to Hawaii on her schooner.

Anolis carolinensis Voight: Mr. Davis reported for Nobuo Miyahira that this American chameleon lizard was found on a mango tree in Wailuku, Maui on June 3, 1964, the first record of this reptile on Maui.

Achaea janata (L.): Mr. Davis reported for Stephen Au that a light to moderate growth of castor bean plants growing in a 40-acre tract at Kekaha, Kauai was heavily attacked by the noctuid moth, *Achaea janata* (L.). This is the first major outbreak in more than 10 years.

Montandoniola moraguesi (Puton): Mr. Davis reported that shipments of this Philippines anthocorid were received from Noel Krauss, currently in Manila, and two releases, one at Pauoa and one in Manoa have been made to date. *M. moraguesi* was introduced for the control of the Cuban laurel thrips, *Gynaikothrips ficorum.*

The following notes were presented by E. Shiroma.

Cryptophlebia ombrodelta (Lower): On May 8, 1964, J. Nichols intercepted a larva of this olethreutid moth in the stem end of an immature coconut from Oahu being mailed to California. Coconut is a new host record for this insect in the State.

Ischnaspis longirostris (Signoret): In litchi leaves from Hilo, Hawaii, sent by W. Chun, Steve Nakahara, Port Entomologist at Seattle, Washington, reported to Mr. Shiroma that he had found this black thread scale together with specimens of *Coccus acutissimus* (Green) on February 23, 1963. Mr. Chun had also sent some specimens of *C. acutissimus* on litchi leaves for the USDA port collection in Honolulu and upon close examination, a specimen of this scale was also found. This constitutes a new insect record for the island of Hawaii and also a new State host record.

Sternochetus mangiferae (F.): On May 30, 1964, while slicing a ripe mango from Kaimuki, E. Ziegler noticed a heavy amount of frass in one section. Closer examination of the flesh revealed a hollowed-out chamber of about one-half inch diameter filled with frass and containing a pupa of the mango weevil, *Sternochetus mangiferae* (F.). Examination of the fruit and seed revealed that the development of the weevil took place entirely in the flesh. The seed was clean and no puncture marks of exit or entrance could be found in the seed coat. The larva evidently developed when the fruit was too mature and the seed coat was too hard to penetrate. This is the second reported incidence of this weevil developing in the flesh. The first report was by Mr. Balock of the USDA Fruit Fly Laboratory at the November 1960 meeting of the Society [PROCEEDINGS 17: 327].

The following notes were presented by Mr. Sakimura.

Rhopalosiphum rufiabdominalis on pineapple: Aphid infestations on pineapple plants have never been recorded in Hawaii or elsewhere. The first incidence of a small infestation was observed in Poamoho, Oahu in April 1964. The few young fruits were heavily colonized by the rice-root aphid, *Rhopalosiphum rufiabdominalis* (Sasaki), determined by Miss Louise Russell of USDA. Roots of pineapple and of several species of grass growing nearby, however, did not show any signs of infestation. The infestation completely disappeared shortly after it was first seen. This species has been known in Hawaii since 1940 under the names of *Cerosipha californica* Essig or *C. subterranea* Mason. Its distribution is worldwide, and it infests roots of members of the grass family, as well as several other non-grass crops and ornamental plants.

Plutella maculipennis (Curtis): A cruciferous ornamental herb, *Alyssum,* has been constantly and severely injured in the recent months by the plutellid moth, *Plutella maculipennis* (Curtis) in a yard in the Diamond Head area. The determination was made by Dr. Beardsley.

JULY 13, 1964

The 703rd meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, July 13, 1964, in Agee Hall, HSPA.

Members present: Abramovitz, Beardsley, Bryan, Davidson, Fullaway, Joyce, Kim, Look, S. Mitchell, W. Mitchell, Nakata, Pemberton, Perkins, Ross, Sherman, Shiroma, Suehiro, Sugerman, Suman, Woolford, and Ziegler.

Visitors: V. K. Ganesalingam, Freeman McEwen, Karen Yoshida.

James Ikeda, Satoru Miyazaki, Elizabeth Thomas, and Pedrito Silva were unanimously elected to membership in the Society.

Mr. Davis presented an obituary of Mr. James R. Holloway, Leader, Biological Control of Weeds Investigations, Entomology Research Division, U.S. Department of Agriculture who died on June 13, 1964 in Oakland, California. Mr. Holloway joined our Society in 1957 while on a tour of duty in connection with the fruit fly problem in Hawaii.

Drs. Mitchell and Sherman reported on various papers presented at the meetings of the Pacific Branch of the Entomological Society of America held at Long Beach, and also gave some interesting comments on the sessions in general.

NOTES AND EXHIBITIONS

The following notes were presented by E. Shiroma.

Hysteroneura setariae (Thomas): On December 28, 1963, Inspectors Makino and Tenney intercepted 15 specimens of this rusty plum aphid on the leaves of a coconut seedling from Honolulu destined for California. This constitutes a new host record for this recent immigrant aphid and according to Miss Louise M. Russell who did the identification, a rather unusual host record for

this aphid. *H. setariae* was first reported by Dr. Beardsley on wire grass, *Eleusine indica* (L.), at Ewa, Oahu on October 9, 1961 [PROCEEDINGS 18: 21, 1962] and again on sugar cane leaves at Mapulehu, Molokai on January 3, 1963 (ibid. 200, 1963).

Corticeus sp.: An adult specimen of this tenebrionid was intercepted by Inspector Patrick Fox on February 27, 1962 on ti logs from Honolulu going to California. This constitutes a new insect record for the State. The specimen was determined by T. J. Spilman.

Aculus broussaisiae Keifer, **Aceria pisoniae** Keifer: These two eriophyid mites, collected by Earl Ozaki were recently described by Mr. H. H. Keifer of the State of California Department of Agriculture. *Aculus broussaisiae* was collected at Palikea, Oahu ex *Broussaisia* leaf, July 14, 1963, and *Aceria pisoniae* at Mokuleia, Oahu, on *Pisonia* leaf, August 25, 1963.

The following notes were presented by J. W. Beardsley.

Correct name for Hawaiian carpenter bee: Attention was called to a recent monograph by Paul D. Hurd, Jr. and J. S. Moure, A Classification of the Large Carpenter Bees (Xylocopini) (Hymenoptera, Apoidea) (UNIV. CALIF. PUB. ENT., 29, 1963). In this work (p. 150) the correct name for the species present in the Hawaiian Islands is given as *Xylocopa (Neoxylocopa) sonorina* Smith, described in 1874 (TRANS. ENT. SOC. LONDON, 278). This carpenter bee has been identified variously in our literature as *X. aeneipennis, X. brasilianorum,* and *X. varipuncta.*

New immigrant geometrid moth: Specimens were exhibited of a small geometrid moth which appears to be another newly established immigrant. The species was first collected in Aina Haina at light by Dr. Beardsley on May 15, 1964 and additional specimens have been taken at this locality, at the University of Hawaii campus in Manoa Valley, and in a light trap operated by the HSPA at Ewa, Oahu. Specimens have been submitted to the U.S. National Museum for determination.

New Maui insect records: Two species apparently not heretofore recorded from Maui were collected by Dr. Beardsley on June 12, 1964. These are the beet leafhopper, *Circulifer tenellus* (Baker), Kahului, on *Atriplex semibaccata,* and a mirid bug, *Rhinacloa forticornis* Reuter, Kahului and Kula, on *Amaranthus* and *Chenopodium.*

Pseudococcus obscurus Essig: Dr. Beardsley reported that he had recently identified specimens of this immigrant mealybug on papaya from the Kapoho area of Hawaii. This is a new island record for the mealybug which has been recorded previously from Oahu, Maui, and Kauai.

Amblyomma americana (L.): Dr. Joyce reported that a single female specimen of the lone star tick was taken on July 9, 1964, from a dog in quarantine at the Hawaii State Animal Quarantine Station. This is apparently the first record of this species being taken from a dog imported into Hawaii. The

dog arrived the previous day from Petersburg, Virginia. The female tick is easily recognized by a conspicuous silvery-white spot at the tip of the scutum.

All stages of this tick freely attack man as well as many domestic animals. The long mouth parts may produce a severe painful lesion. It is a known vector of Rocky Mountain spotted fever, tularemia, Q fever, and Bullis fever. The lone star tick is found in the southeastern United States from central Texas to the east coast and as far north as Iowa and New York. It also extends down through Central America to as far as Brazil.

Dermacentor variabilis (Say): Dr. Joyce reported that the American dog tick is usually encountered on a few dogs arriving in quarantine from the mainland United States nearly every year. Two lots were identified in late June of 1964. He exhibited a female specimen which was removed fully engorged from a dog on June 25. It was decided to isolate and keep the specimen alive to see if she would lay viable eggs under local conditions. The first eggs were noted on July 6. Egg laying continued, and a large mass of several thousand eggs was exhibited. *D. variabilis* has not become established in Hawaii.

The following notes were presented by W. C. Mitchell.

Dacus dorsalis Hendel: Males of the Oriental fruit fly were observed in large numbers on the newly opened blossoms of the golden shower, *Cassia fistula* L., moving over the surface of the flower petals and lapping or sponging the surface. This has been observed on several occasions over the past few years at Waimanalo, Manoa, and Haleiwa. Oriental fruit flies did not appear to be attracted to rainbow or to pink-and-white shower tree blossoms which were 20 feet from the golden shower.

Anaballus amplicollis (Fairmaire): Fourteen specimens of this weevil were reared from coffee cherries collected May 10, in the Koike farm, Kealakekua, Kona, Hawaii (see note, p. 16). This is a new host record and island record for Hawaii. *A. amplicollis* was first reported by D. T. Fullaway who reared it from seeds of *Saraca indica* L. (sorrowless tree) and *Castanospermum australe* A. Cunn. (Moreton Bay chestnut) at St. Louis College, Oahu, in October 1906. The weevil was identified by E. C. Zimmerman [for detailed description see B. P. BISHOP MUS., OCC. PAPERS 12(17): 4–5, fig. 1, a, 1936]. This insect has been collected throughout the Pacific from New Caledonia to the Marquesas.

Pyroderces rileyi (Walsingham): The pink scavenger moth (Cosmopterigidae) was reared from the same coffee cherries. Nine specimens of an unidentified moth (probably a tineid) were also reared from the sample.

Poronotellus sodalis White: This anthocorid bug was observed preying upon the Cuban laurel thrips, *Gynaikothrips ficorum* on the University campus, Manoa on May 28.

Nezara viridula L.: Four reports of damage to hibiscus blossoms by the green stink bug were received the last week in June, from Kaimuki, Wailupe Circle, and Aina Haina.

Mr. Kim presented the following notes.

Xylosandrus compactus Eichhoff: On June 30, the coffee twig borer beetle was found infesting mature pseudobulbs of *Cattleya* orchids in Nuuanu. This is a new host record for the State though it is now commonly found on orchids of the genus *Dendrobium.*

Telenomus basalis established on Kauai: For S. Au, Mr. Kim reported that *T. basalis* Wollaston was found established at Lihue, Kauai, June 26, 1964. A *Nezara* egg cluster found on cowpea was 81 percent parasitized.

Mr. Kim presented the following notes for Mr. Davis.

Nezara viridula smaragdula (F.): On June 10, this office was advised by the County Extension Agent in Kona that southern green stink bugs had reached "explosion" numbers in the Kona macadamia orchards and that 50 percent of the ground nuts were severely damaged. An assessment of the damage conducted by the State Entomologist, assisted by Mr. H. F. Thornley and staff, Plant Pest Control Division, U.S. Department of Agriculture, showed that 91 percent of the ground nuts and 49 percent of the tree nuts were heavily damaged in one 82-acre orchard. Damage to other orchards in Kona ranged from 2 to 83 percent.

Hypericum perforatum: Mr. Norman Carlson, Bishop Estate, reported the discovery recently of Klamath weed, *H. perforatum* on Mt. Hualalai, between 6,000 and 7,500 feet, in an area of approximately 2,000 acres. The identification of the weed was confirmed by M. Neal of Bishop Museum. The chrysomelid, *Chrysolina quadrigemia* effectively controlled Klamath weed in California and will most likely be introduced for the biocontrol of this pest on Hawaii.

AUGUST 10, 1964

The 704th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, August 10, 1964 in Agee Hall, HSPA.

Members present: Abramovitz, Arthur, Beardsley, Bess, Chong, C. Clagg, H. Clagg, Forster, Fullaway, Hardy, Holway, Holzapfel, Ikeda, Joyce, Kajiwara, Look, McEwen, Nakao, Nakata, Pemberton, Perkins, Quate, Samuelson, Sherman, Shiroma, Suehiro, Suman, Thomas, and Yukawa.

Visitors: Blair R. Bartlett, University of California, Department of Biological Control, Riverside, and Ashok Kumar Raheja.

Dr. Freeman McEwen was unanimously elected to membership in the Society.

Drs. Henry Bess, D. Elmo Hardy, and L. W. Quate, just returned from attending the 12th International Congress of Entomology in London, gave some interesting comments on the various sessions they attended as well as their personal impressions of the Congress. The next Congress will be held in Moscow in 1968.

NOTES AND EXHIBITIONS

The following notes were presented by Dr. C. R. Joyce.

Dermacentor variabilis (Say): The eggs of this species reported on at the July meeting hatched during the period from July 28 to August 10, with an incubation period, between the time of initial egg laying and first hatching, of 22 days. The eggs had been kept in a vial over sand in the laboratory at room temperature. The larvae were then destroyed with no effort to carry them further through the life cycle.

Haemaphysalis wellingtoni Nuttall and Warburton: Specimens of this tick were taken from a Malay argus pheasant which arrived at Honolulu from Thailand on July 17, 1964 and was placed in quarantine. The engorged female specimen here exhibited was submitted to this office for determination by the Veterinary Diagnostic Laboratory of the State Department of Agriculture, and its identity as *H. wellingtoni* was confirmed by Dr. Kohls of the Rocky Mountain Laboratory. This tick species occurs in Borneo, Malaya, New Guinea, Sarawak, Java, Sumatra, Siam, Indochina, Burma, Andaman Islands, and India. It is found commonly on domestic fowl as well as on a great variety of birds and other animals. Little is known of its disease-carrying potentialities.

Paraspiniphora sp.: A new genus for Hawaii of phorid flies recently made its appearance here. Male specimens were taken in a light trap at the Honolulu Airport on July 12 and August 3, and at Ft. Armstrong on July 20. One female was taken in a fly trap at Ft. Armstrong on August 10.

Mr. E. Shiroma presented the following notes.

Ceroplastes cirripediformis Comstock: On July 18, 1964, Eugene H. Davidson submitted a specimen of this barnacle scale on a stem of *Gardenia taitensis* from Kailua, Oahu. This constitutes a new host record for this scale in Hawaii.

Pealius hibisci (Kotinsky): On May 20, 1964, a specimen of this hibiscus whitefly, determined by L. M. Russell, was intercepted on a leaf of *Gardenia jasminoides* from Oahu. This constitutes a new host record for this whitefly. Zimmerman (INSECTS OF HAWAII 5: 46) lists the host plants as *Hibiscus tiliaceus, H. arnottianus,* and cultivated hibiscus.

Protaetia fusca (Herbst): For Mr. Van Zwaluwenburg, Dr. Beardsley reported that considerable numbers of adult *Protaetia fusca* (Herbst) were observed feeding on the new leaves of *Coccolobis uvifera,* the sea grape. This constitutes a new host record for this beetle on Maui.

The following notes were presented by Dr. Beardsley.

Hippodamia convergens Guerin: An adult specimen, determined as the convergent lady beetle, was collected on a *Railliardia* shrub at about 9,800 ft. altitude on Haleakala, Maui, on July 28. This species, an important predator of aphids in North America, was purposely introduced into Hawaii on several

occasions [1896, 1905, 1910, and 1952; see PROCEEDINGS 15(1): 129, 1953]; but this is the first record of field recovery of this coccinellid.

This capture indicates that the convergent lady beetle is probably established at higher altitudes on Haleakala. It is a temperate climate species, and perhaps has not been able to adapt to life in our more tropical, lowland areas, or may be unable to compete successfully in the lowlands with other aphidophagous coccinellids such as *Coelophora inaequalis.*

Nysius kinbergi Usinger damaging vanda orchids: On July 31, Dr. Beardsley examined a vanda orchid planting at Kapoho, Hawaii, and found considerable brown spotting of the flowers. Numerous adults of *Nysius kinbergi* were present on the flowers and spotting appeared to have been caused by the feeding of these insects on the developing flower buds. *N. kinbergi* adults were also very plentiful on flower heads of *Pluchea odorata* shrubs in waste areas surrounding the vanda plantings, and it seems likely that these bugs had moved to the orchids from that source.

No specimens of *Nysius caledoniae* Distant were present among the approximately 200 adult *N. kinbergi* specimens collected from vanda and *Pluchea.* However, *N. caledoniae* was reported damaging vandas at Kapoho in June of this year. A single adult of *N. caledoniae* was collected on *Emilia sonchifolia* at the Hilo airport.

Tenodera australasiae (Leach): Several oothecae of this mantid were collected from coconut foliage near the Kahului Airport, Maui, on July 31.

Anthrax distigma (Weidemann): An adult specimen of this bombyliid fly was observed resting on *Scaevola* foliage at Spreckelsville, Maui, on July 29.

Neophyllaphis araucariae Takahashi: Light infestations of the *Araucaria* aphid were found on young Norfolk Island pine trees *(Araucaria excelsa)* at Kapoho, Hawaii, on July 31.

Chiracanthium diversum Koch: This clubionid spider, which has occasionally been responsible for painful bites here, was found on Maui (at Kahului and Waiakoa on July 29–30) and on Hawaii (at Kapoho, July 31).

Argiope appensa Walcknaer: Several specimens of this large yellow and black orb-weaving spider were observed near the Hilo airport on July 31.

Anoplolepis longipes Jerdon: This ant was abundant in waste area vegetation near the Hilo airport on July 31, where it was observed tending the mealybug *Nipaecoccus nipae* (Maskell) on guava. This ant has been previously reported from Hawaii at Kona in 1959, but this is the first record from the Hilo area. It is frequently found in association with various species of honeydew secreting coccids.

The following notes were presented by Mabel Chong.

Unknown geometrid moth: Specimens of the newly established immigrant geometrid moth which was reported from Oahu for the first time at the July

meeting, were collected at light at Waiakoa and Spreckelsville, Maui, on July 29 and 30. The species has not yet been identified. Numerous adults were reared from kiawe flowers collected at Ewa and Moanalua in July and August; one adult was captured at Ewa, July 17, in a light trap operated by the HSPA Experiment Station.

New immigrant acridid: On August 3, 1964, a civilian employee of the U.S. Coast Guard Station on Sand Island, Oahu, captured a large gravid female grasshopper (Acrididae) on the premises of the Coast Guard base. It was still alive when brought to the Department of Agriculture laboratory and deposited a total of 17 eggs in the jar in which it was held. To date, none of the eggs has hatched.

A check of the area around the Coast Guard Station was made on the same day by the Department of Agriculture personnel but found nothing resembling this specimen which was exhibited.

SEPTEMBER 14, 1964

The 705th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, September 14, 1964, in Agee Hall, HSPA.

Members present: Aoki, Arthur, Ashlock, Bess, Bryan, C. Clagg, H. Clagg, Forster, Fullaway, Haas, Hardy, Hart, Holzapfel, Holway, Ikeda, Kajiwara, Kamasaki, Kim, Look, W. Mitchell, Nakata, Ozaki, Pemberton, Perkins, Quate, Sherman, Shiroma, Steffan, Suehiro, Sugerman, Suman, Thomas, Tsuda, and Woolford.

Visitors: Carl H. Gaddis, Jr., Blair R. Bartlett, Katherine Korboot, Eugenia C. Manoto, John L. Mellott, Nelia P. Salazar, and Robert T. Yara.

V. K. Ganesalingam, Ashok Kumar Raheja, Benjamin Hu, and Carl K. Sato were unanimously elected to membership in the Society.

Mr. P. D. Ashlock, who participated in the Galapagos International Scientific Expedition during January-March 1964, gave an interesting talk, illustrated by excellent colored slides.

NOTES AND EXHIBITIONS

Hippodamia convergens Guerin: Mr. Bianchi reported that two specimens of *H. convergens* were collected on August 13, 1964, at Pohakuloa, Hawaii, a first recovery record for the island of Hawaii.

Nysius caledoniae Distant: Mr. Ashlock received confirmation of the identity of *Nysius caledoniae* from R. L. Usinger who compared specimens sent from Oahu by Mr. Ashlock with the type of *N. caledoniae* in the British Museum.

The following notes were presented by Dr. Mitchell for J. W. Beardsley.

Cosmophila flava Fabricius?: A single headless specimen of a noctuid moth which appears similar to specimens in the HSPA collection from Samoa determined as this species was found by J. W. Beardsley in some miscellaneous light

trap material collected in a State Department of Public Health light trap on Oahu, presumably during August. *C. flava* is widespread in the Old World tropics. Dr. Swezey (1946, BULL. B. P. BISHOP MUS. 189: 174) states that it is found also in Japan, Formosa, and on Pacific islands such as Fiji, Samoa, and the Marquesas, in addition to Guam. Samoan specimens in the HSPA collection were reared on okra, and Swezey reared it on *Hibiscus tiliaceus* and two other malvaceous hosts. Beardsley reared this, or a very closely related species, from okra at Koror, Palau Is. in 1954. If it proves to be established here, this will be another new insect record for the state, and one which could become a garden pest on okra, ornamental hibiscus, and cotton.

Unidentified noctuid moth: The above-mentioned light trap material and another batch from the same source, dated August 31 to September 9, 1964, contained three specimens of another noctuid moth, as yet unidentified, which is unknown to Dr. Beardsley, and which appears to be another newly established immigrant.

Schistocerca vaga (Scudder): The second local specimen of this grasshopper, an adult male, was captured by Dr. Beardsley on Sand Island, in the area just across the road from the U.S. Coast Guard Station, on August 10; eight additional specimens, three females and five males, were captured in an area of about 50 acres situated just Ewa of the U.S. Coast Guard grounds by Dr. Beardsley and two men from the State Department of Agriculture on August 12. Many additional grasshoppers were seen and several captured the following afternoon. A number of other spots on Sand Island, near the airport and near the pineapple cannery and docks on the Honolulu side directly opposite the infested area were searched for grasshoppers with negative results.

On the afternoon of August 18 a single adult female, captured near the Funai boat works off Sand Island Access Road, was brought to the University. This specimen died after about 36 hours. So far this is the only specimen captured outside of Sand Island which has come to Dr. Beardsley's attention.

In laboratory tests, grasshoppers fed readily on leaves of sugar cane, Napier grass, and MacArthur palm, and slightly on citrus leaves and pineapple tops. One female deposited an egg mass in soil which was provided, but it is not known if these are viable. Of four females and five males held alive at the University, only one female, captured August 14, now remains alive; the others were probably injured during capture.

Inasmuch as this infestation appears to be very localized as yet, it appears that there is a good chance for eradication. The State Department of Agriculture should be commended for its action in this direction and urged to continue the eradication campaign as long as is necessary, or until further evidence comes to hand indicating a wider distribution of the grasshopper here than is presently known.

Trichopoda pennipes Fabricius: Mr. Kim presented a note for Nobuo Miyahira who reported that *T. pennipes,* the Florida tachinid parasite, was recovered for the first time on Maui. Field recoveries indicate *Nezara viridula* parasitism at about 40 percent.

Mr. Kim presented the following notes.

Recovery and establishment of Montandoniola moraguesi (Puton): *M. moraguesi,* the anthocorid Cuban laurel thrips predator imported from the Philippines by Noel Krauss was recently recovered in the Pauoa area of Honolulu. Many adults and various nymphal stages were observed in thrips-infested leaves of *Ficus retusa.* The initial release of 100 adults of this predator was made on June 2, 1964 in this area. From observations it seems that this thrips predator has become well established.

Schistocerca vaga (Scudder): The State Department of Agriculture has received the determination of the new immigrant acridid as *Schistocerca vaga* from A. B. Gurney, U.S. National Museum. Spraying for *Schistocerca vaga* on Sand Island has been completed, using Dieldrin at the rate of 4 oz. (Technical) per 100 gallons to cover approximately 320 acres of vegetation. Of interest was the capture of five nymphs probably in the third instar, green in color, found on *Waltheria americana,* a common weed. Also of interest was the finding of *Paraidemona mimica* Scudder, the wingless grasshopper. Many of them were found feeding on pickle weed, *Batis maritima,* growing along ditches.

Brachycolus heraclei Takahashi: Dr. Mitchell reported that a heavy infestation of the celery aphid destroyed a celery planting in Lualualei Valley, Waianae, Oahu, the latter part of July.

Ereunetis simulans (Butler): Dr. Mitchell reared one adult moth of *E. simulans* from larvae collected on the monkeypod trees at Punchbowl National Cemetery the latter part of August. Larvae of this tineid moth tunneled the bark and damaged the cambium in several places. Swezey (HSPA EXPT. STA. ENT. BULL. 6: 13–15, pl. 2, figs. 10–12, 1909) states that the larvae of this species "feed in dead wood, particularly the bark and outer parts of stems and trunks." It apparently has not been reported attacking live trees. Perhaps another species was involved at Punchbowl or perhaps damage to cambium of the affected trees was incidental to feeding by the larvae in the bark. The moth was determined by J. W. Beardsley.

The following notes were presented by E. S. Shiroma.

Parabemesia sp.: A pupa of this aleyrodid fly was intercepted in quarantine on a *Gardenia jasminoides* sepal from Hawaii by Inspector Robert Kunishi on April 18. This constitutes a new insect record for the State. Miss Louise M. Russell, who determined the specimen, reports that she has on record two previous collections of this aleyrodid from Hawaii. She thinks this is an undescribed species, but needs more specimens before she can be certain.

Cryptophlebia ombrodelta (Lower): Inspector Carroll Jones intercepted a larva of this olethreutid moth boring in a seed pod of *Prosopis pallida* (kiawe) from Oahu. This constitutes a new host record for this insect in Hawaii.

Neophyllaphis araucariae Takahashi: Mr. Shiroma reported for Benjamin Hu, Inspector in charge, Plant Quarantine Division, Hilo, Hawaii that this

aphid was first discovered by himself and Inspector Norman Neff in Kapoho, Hawaii on April 28. Subsequently, this aphid has been intercepted several times, all on *Araucaria excelsa* trees being shipped to Los Angeles.

Cuban laurel thrips: Mr. Kim reported for Ernest Yoshioka that the Cuban laurel thrips was collected on Hawaii on August 16 infesting banyans in Waialoa Park, Hilo, Hawaii. Of interest were larvae of an unidentified lace wing (Neuroptera) preying on the thrips, a new host record.

Stephanoderes farinosa Blandford: For Harry Nakao, Mr. Kim reported that this beetle borer was reared from dying lychee twigs collected on Oahu. Determination of this species was made by Stephen Wood, Brigham Young University, and is a new insect record for the State.

Mosquitoes on Guam, Philippines, and Canton I.: Capt. Holway's observations of the mosquito situation on Guam in July revealed that *Culex tritaeniorynchus* is extremely abundant in the Apra Harbor area. The light trap index (females per trap night) at two locations has increased greatly since April; one trap was giving counts of several hundred per night in July as compared with under 30 in April. *Culex quinquefasciatus,* however, has shown a marked decrease in numbers. This is consistent with data from Taiwan and Okinawa where *tritaeniorynchus* reaches a peak during the summer months while populations of *quinquefasciatus* become considerably lower. Of the 14 mosquito species on record, 10 have been taken this year. Those not found include *Aedes aegypti* (which has not been taken on Guam since 1948), *Aedes oakleyi, A. guamensis,* and *Culex sitiens.* Three species introduced during the last 3 to 7 years and well established are *Mansonia uniformis, Culex tritaeniorynchus* and *Aedeomyia castasticta.*

During a visit to the Philippines in July, 13 species of mosquitoes were taken in the Subic Bay area; the absence of mosquitoes on Canton Island was confirmed in September. In all about 40 species of insects were collected on Canton.

OCTOBER 12, 1964

The 706th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, October 12, 1964 in Pauahi Hall, B. P. Bishop Museum.

Members present: Aoki, Arthur, Ashlock, Beardsley, Bess, Bryan, Chong, H. Clagg, Delfinado, Forster, Fujimoto, Fullaway, Ganesalingam, Gressitt, Hardy, Holzapfel, Joyce, Komatsu, Look, McEwen, W. Mitchell, Nakao, Nakata, Pemberton, Perkins, Quate, Raheja, Sakimura, Samuelson, Sherman, Shiroma, Steffan, Suehiro, Suman, Thomas, Tsuda, Voss, Yoshimoto, and Ziegler.

Visitors: Hatsuko Arakaki, Eunice Au, Blair R. Bartlett, Niphan Chanthawanich, Ann Cutting, Joyce C. Inouye, K. Korboot, Simglien Lee, Paula Leedy, Grace Nakahashi, Mohammad Shahjahan, Helen Tong, and Clara Uchida.

Robert Kunishi, Norman Neff, and Carl H. Gaddis were unanimously elected to membership in the Society.

Dr. J. W. Beardsley presented an interesting talk on his recent entomological investigations on the leeward Hawaiian islands. A preliminary check of the insects collected indicates a number of new records and new species.

Notes and Exhibitions

Ceroplastes cirripediformis Comstock: Miss Chong reported that Nobuo Miyahira, on September 16, 1964, reported an infestation of the barnacle scale, *C. cirripediformis,* in the Reynolds Tobacco Company passion fruit farm on Maui. On October 1, C. J. Davis and Stephen Au observed a heavy infestation of this immigrant coccid at Lawai, Kauai, also on a commercial planting of passion fruit. It is believed these constitute first island records of this scale for Maui and Kauai. Positive identification of this species was made by R. F. Wilkey, Bureau of Entomology, Sacramento, California.

Miss Chong presented the following notes for C. J. Davis.

Schistocerca vaga (Scudder) **eradication:** Surveillance and treatment operations continued for the immigrant grasshopper, *S. vaga,* on Sand Island. A total of 4 adults and 24 nymphs were captured in September, the nymphs ranging from first to third instars. Nearly all were captured on the weed, *Waltheria americana,* upon which they appeared to be feeding. All infested areas were treated, and no grasshoppers were found during the first half of October.

Eggs recovered from a gravid female captured on Sand Island on August 23 hatched on September 30, a total incubation period of 38 days. Of 75 eggs, 61 numphs emerged.

Gynaikothrips ficorum Marchal: The Cuban laurel thrips was found on *Ficus retusa* in Kailua, Kona by U.S.D.A. Pest Control workers on September 14, 1964. *G. ficorum* was first reported on Hawaii at Wailoa Park, Hilo on August 16, 1964.

African snail infestation: An African snail infestation in Kona, Hawaii was confirmed by our Resident Entomologist in Hilo. A total of 20 snails has been picked up since October 6. Delineation of the infested areas is in progress and preliminary reports indicate that eradication is feasible. This is the third major infestation of the African snail to appear on the island of Hawaii and of these, one has been definitely eradicated. Eradication of the Hakalau infestation seems very promising.

The following notes were presented by E. S. Shiroma.

Lindingaspis rossi (Maskell): This diaspid scale was found by Benjamin Hu at Kapoho, Hawaii, July 18, 1964, infesting *Araucaria excelsa* trees, a new host and new island record for the State.

Aphis oenotherae Oestlund: Mr. Hu also collected several specimens of this evening primrose aphid on leaves of *Oenothera striata* from the Volcano area, Hawaii, December 30, 1963. This is a new insect record for the State. According to M. A. Palmer (Aphids of the Rocky Mountain Region, 1952), this

aphid is found throughout the Rocky Mountain region on leaves and stems of *Epibobium angustifolia, Oenothera strigosa,* and *O. caespitosa.* Identification was made by Miss L. M. Russell of the U.S. National Museum.

Chrysopa lanata Banks: Dr. Mitchell observed a larva of this neuropterous insect preying upon *G. ficorum* Marchal on banyan trees at the university, near the East-West Center, on July 28. The larva, which was reared in the laboratory, pupated and emerged the latter part of August. This is the first record of a chrysopid larva preying on *G. ficorum.* The anthocorid, *Poronotellus sodalis* (White), has been reported previously as being predaceous upon the thrips.

NOVEMBER 16, 1964

The 707th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, November 16, 1964 at the Experiment Station, HSPA.

Members present: Beardsley, Bess, Chong, H. Clagg, Davidson, Davis, Delfinado, Forster, Fullaway, Gaddis, Hardy, Hart, Ikeda, Kajiwara, Komatsu, Look, Nakao, Nakata, Nishida, Pemberton, Quate, Raheja, Samuelson, Sherman, Shiroma, Suehiro, Sugerman, Suman, Thomas, Voss, and Yoshimoto.

Visitors: V. Basao, Blair R. Bartlett, Louis A. Henke, Akira Nagatomi, Ramesh C. Saxena, Herman T. Spieth, and E. Swift.

Mohammad Shahjahan and Niphan Chanthawanich were unanimously elected to membership in the Society.

Dr. Henry A. Bess, who was engaged in the problem of investigating the status of the rice stem borer and its predators in Japan, in connection with the U.S.-Japan Cooperative Science Program, presented an interesting talk. It was illustrated by excellent colored slides of various aspects of the program which took him to Japan, Philippines, parts of Southeast Asia, Madagascar, and West Africa.

NOTES AND EXHIBITIONS

Cuban laurel thrips: Mr. Nakao reported for John Blalock that the Cuban laurel thrips was collected on Molokai. On November 13, 1964, Mr. Blalock, County Extension Agent, sent in specimens of the thrips and infested *Ficus retusa* leaves picked up in three localities at Kaunakakai. The infestation seems to be confined to Kaunakakai and constitutes a new island record for the thrips.

Release of Montandoniola moraguesi: Harry Clagg reported that during late August and early September 1964, adults of *M. moraguesi* were released on the foliage of a Chinese banyan which had a heavy infestation of the Cuban laurel thrips, *Gynaikothrips ficorum* March. In November 1964, a survey of the leaves infested by *G. ficorum* showed that 20 percent also contained *M. moraguesi* in various stages of development. One week later, *M. moraguesi* had increased in numbers and was found in 40 percent of the leaves infested by *G. ficorum.* All stages of *G. ficorum* were being preyed upon by both adult and nymphal stages of *M. moraguesi,* and a large number of damaged leaves were found to contain only dead *G. ficorum.*

The following notes were presented by C. J. Davis.

Schistocerca vaga (Scudder): Entomology branch personnel of the State Department of Agriculture continued surveillance and eradication measures on Sand Island for the vagrant grasshopper, *S. vaga.* During the latter part of October, two adults were captured. Rains during the early part of November apparently triggered the hatching of eggs on Sand Island as a total of 15 first-to-third instar nymphs were found. All were found on the weed, *Waltheria americana,* a good "indicator" plant for young nymphs.

Montandoniola moraguesi (Puton): This predacious anthocorid is spreading throughout Honolulu and rural areas on Oahu. In addition to Pauoa Valley and Manoa Valley, it was recovered on Round Top, Ala Moana Park, Honolulu International Airport, Lanikai, Kaneohe, and Sand Island. It was recovered for the first time at Port Allen, Kauai by Stephen Au.

Octotoma scabripennis Guerin: The first recovery on Oahu of this lantana blotch leaf mining chrysomelid was made by James Kim and Maurice Hironaka, State Department of Agriculture, from material collected on Round Top Drive, Tantalus. This chrysomelid was originally introduced in 1902 and reintroduced in 1953 and 1954. The first recovery was in the Kona district, Hawaii, in July 1963.

Catabena esula Druce: A moderately heavy *C. esula* infestation of lantana in the Ulupalakua-Auwahi area, Maui, was reported by Nobuo Miyahira. On each bush, 5 to 10 late instar and fresh cocoons were noted. This activity is 2 to 3 months earlier than in the previous four years, and is the first report of the work of this noctuid in the State this year.

Microlarinus spp.: Stephen Au, of Kauai, recorded feeding injury by puncture vine weevils on the weeds *Amaranthus spinosus, Chenopodium album,* and *Malva parviflora.* Only plants in close proximity to *Tribulus* were attacked. A similar observation was made on Oahu by Navy and State Department of Agriculture entomologists.

Ceroplastes cirripediformis Comstock: Mr. Shiroma reported that several specimens of this barnacle scale on *Eugenia* sp. were submitted for identification by S. Matayoshi of Hilo on October 27. This constitutes a new host record as well as a new insect record for the island of Hawaii. Also, on October 20, Mr. Shiroma collected several specimens of this scale in the Fort Kamehameha area of Hickam Air Base, Honolulu, on stems of *Pluchea indica,* another new host record.

The following notes were presented by J. W. Beardsley for W. C. Mitchell.

Minthea reticulata Lesne: Three specimens of this lyctid beetle were collected by Mrs. F. Achong at Hawaii Kai, Oahu. The beetles had emerged from some mahogany *(Shorea polysperma)* furniture manufactured locally of lumber which had been imported from the Philippines. The beetles had made exit holes from unfinished (painted) parts of the furniture. The specimens were identified by

Mr. T. J. Spilman, Insect Identification and Parasite Introduction, U.S.D.A., Washington, D.C.

The distribution of the species is as follows: Saigon, Palembang, Sumatra, Sarawak, Borneo, Philippines, Makassar, Celebes, Ceram, New Guinea (Gerberg, 1957, USDA TECH. BULL. 1157: 32). The only host mentioned is *Shorea eximia* from the Philippines.

Hyperaspis trilineata Mulsant: A scientific note on the collection, shipment, and biology of this coccinellid in the Barbados and transshipment to Hawaii is given by L. W. Coles [JOUR. ECON. ENT. 57(5): 768, October 1964].

The following notes were presented by J. W. Beardsley.

Cosymbia serrulata (Packard): This determination was received recently from Dr. E. L. Todd, U.S. National Museum, for the small geometrid moth first taken at light in Honolulu in May of this year, and reported as an unidentified new immigrant at the June meeting. It was subsequently found established on Maui and is now reported for the first time from Hilo, Hawaii on the basis of specimens found by Dr. Beardsley in light trap material collected by the State Department of Health in November.

Aphis oenotherae Oestlund: At the October meeting, the evening primrose aphid, *A. oenotherae,* was reported from the island of Hawaii by Mr. Shiroma. Aphids from the primrose *Raimannia odorata* (Jacq.) Sprague and Riley collected in Haleakala Crater, Maui, 7,000 ft. altitude, August 28, 1964 by Dr. Beardsley have been determined by him as this species. This is a new island record.

Hippodamia convergens Guerin: This coccinellid beetle, reported from Maui in June on basis of a single specimen, now appears well established at higher altitudes on Haleakala. On two occasions, in August and September, numerous adults and larvae were taken on *Railliardia* at altitudes of from 7,000 ft. to 10,000 ft.

Cosmophila flava (F.): Two specimens of this newly established immigrant noctuid moth have been taken to date from Public Health Department light trap material from Oahu. *C. flava* is widespread in the south and western Pacific. The larvae feed upon plants such as *Hibiscus,* okra, and cotton.

Unknown noctuid: Specimens of another newly established immigrant noctuid moth were exhibited which is as yet undetermined. One specimen was taken in a light trap at the University of Hawaii campus, Honolulu, November 5, 1964, and several others were taken from Public Health Department light trap catches.

Predation on native Drosophila larvae: Dr. Hardy reported that in connection with their work on evolution and genetics of Hawaiian Drosophilidae, a high percentage of predation on the native *Drosophila* larvae has been found. To date, six species of native *Lispocephala* (Diptera: Muscidae), which were on *Drosophila* larvae in the field, have been reared.

Guam insects: Mr. Shiroma reported that during the latter part of August, Mr. K. L. Maehler, Pacific Regional Supervisor, P.Q.D., A.R.S., USDA, paid a short visit to Guam. While there he collected a total of 88 species of insects. Included were three insects which are believed to be new to Guam:

Conotelus mexicanus Murray: This nitidulid was previously intercepted in quarantine on two occasions in June of this year by Inspector Bart Wetzel with cut flowers from Guam. However, it was not certain whether it was established. Mr. Maehler collected a few specimens of this beetle on *Solanum melongena* flowers from Inarajan on August 25, confirming its establishment there. Determination was by W. A. Connell, U.S. National Museum.

Brachyplatys species?: Mr. Maehler was able to collect many specimens of this plataspid bug, noting large populations on *Phaseolus vulgaris* and *Leucaena glauca* plants at Inarajan, Guam on August 25. According to R. C. Froeschner, U.S. National Museum, this species is not represented in their collection. It is not *B. deplanatus* reported from the Philippines, nor is it *B. insularis* or *B. pacificus,* both of which are known from Guam.

Physomerus grossipes (F.): Mr. Maehler collected about 100 specimens of this coreid bug which he found in abundance on *Solanum melongena* and on several unidentified plants at Inarajan on August 25. This coreid has been reported from India, Indonesia, Malaya, and the Philippines where it attacks beans, butterfly-pea, cowpea, and other legumes, convolvulaceous plants, including sweet potato and other species of *Ipomoea* [REV. APPLIED ENT. (A)18: 243, 1930].

C. P. Clausen records this bug from Malaya as attacking citrus (USDA CIRCULAR 266: May 18, 1933). The eggs, in masses numbering up to 100, are deposited upon the leaves, the female guarding the eggs during the period of incubation and for some days after hatching. The young are very gregarious in habit. The nymphal stage covers about 60 days, and the time from oviposition to death of the adult is about four months. Specimens were determined by J. L. Herring, U.S. National Museum.

DECEMBER 14, 1964

The 708th meeting of the Hawaiian Entomological Society was called to order by President Sherman at 2:00 P.M. on Monday, December 14, 1964 in Agee Hall, HSPA.

Members present: Aoki, Arthur, Bess, Bianchi, Chanthawanich, Chong, C. Clagg, Davis, Delfinado, Dyson, Gaddis, Ganesalingam, Hardy, Holway, Nagatomi, Nakao, Nakata, Nishida, Pemberton, Perkins, Quate, Raheja, Shahjahan, Sherman, Shiroma, Suehiro, Suman, Thomas, Wilson, Woolford, and Yoshimoto.

The members of the Society were saddened to learn of the death of Dr. David T. Fullaway, retired Chief Entomologist for the State Department of Agriculture, on Friday, December 11, 1964 in Honolulu at the age of 84. Dr. Fullaway joined the Society November 5, 1908 and was elected an honorary member in 1949.

Visitors: Blair R. Bartlett, Harry K. Kaya, Ronald Mau, and Mutsuo Miyatake.

Mr. Nakao presented the Treasurer's report which was accepted, subject to audit.

Dr. Beardsley gave an interesting progress report on the insect interference problem at Haleakala Observatory based on recent investigations which he and Mr. Ashlock conducted.

Dr. Akira Nagatomi was unanimously elected to membership in the Society.

The following officers were elected to serve during 1965:

President	Wallace C. Mitchell
President-elect	Laurence W. Quate
Secretary	Edward S. Shiroma
Treasurer	Carl M. Yoshimoto
Advisor	J. W. Beardsley

Outgoing President Martin Sherman gave as his presidential address, "The Effectiveness of Insecticides Orally Administered to the Fowl as a Deterrent to the Breeding of Flies in Droppings."

Notes and Exhibitions

The following notes were presented by C. J. Davis.

Hypothenemus pubescens Hopkins: This scolytid was found on *Cynodon dactylon* stalks at Keawekapu, Maui on November 17 by Nobuo Miyahira, Resident Entomologist, Maui. Further surveys disclosed that it was on giant Bermuda grass, *C. maritimus,* near the beach on the outskirts of Lahaina, December 2; in *C. dactylon* at the new County Beach Park, Molokai, December 3; and in *C. dactylon* stalks at the State Department of Agriculture Insectary, Honolulu on December 7.

H. pubescens was identified by Dr. Stephen Wood, Brigham Young University, a specialist in this group, and this is the first report on this scolytid in the State. According to Dr. Wood, it occurs in Key West, Florida, where it was first collected in 1903.

Catabena esula Druce **and Hypena strigata** Fabricius: These introduced lantana insects from California (*C. esula,* 1955) and east Africa (*H. strigata,* 1957) "exploded" on Maui between Kanaio and Alena during November, causing approximately 10,000 acres of lantana to be denuded. The tingid *Teleonemia scrupulosa* was present but its importance could not be assessed under existing conditions. This is the most widespread defoliation of lantana observed on Maui since 1959 (Butler, et al.).

The following notes were presented by F. A. Bianchi.

Sphenophorus venatus vestita (Chittenden): On December 9, he found 10 living specimens of this billbug among three or four hundred *Rhabdoscelus obscurus* which had been sent from Hilo to Honolulu for experimental purposes. Both species had been trapped together in a small pile of split sugarcane pieces exposed two or three days on the edge of a cane field. One single specimen of

S. venatus vestita had been observed in similar circumstances on October 12, the first record of this species on the island of Hawaii.

Montadoniola moraguesi (Puton): This recently introduced anthocorid predator on *Gynaikothrips ficorum* has now spread to the Diamond Head area of Honolulu. On one *Ficus retusa,* at least, the thrips population appears to be greatly reduced through the feeding of the predator on all stages of the host. On this tree, 28 leaf rolls picked at random yielded only 2 living thrips adults, as against 3 adults and 11 nymphs of the predator. In contrast, a tree located high up on Mt. Tantalus yielded, on the same date, about 150 adult thrips and 10 intact egg masses from 11 leaf rolls, although the same leaf rolls also contained 4 adult anthocorids.

The following notes were presented by George Komatsu.

Toxorhynchites splendens (Wiedemann): Periodic field releases of this mosquito were made from 1950–1957, initially limited to Oahu and later extended to neighbor islands. Three larvae were collected by Mr. Joe Duarte (Sanitary Inspector I, Mosquito Control), October 21, 1964, at a home in Halawa Valley, Molokai and sent to Vector Control Branch, Mosquito Control. Only one specimen survived the trip which, after emergence, was determined to be the species introduced as *T. splendens.* This is a new island record.

Regarding the identity of this species, it appears that it was misidentified at the time of introduction into Hawaii. In personal communication from Dr. John N. Belkin, Professor of Zoology, University of California, Los Angeles, to P. Nakagawa, dated December 13, 1963 he states that ". . . in all probability the species which has been called *splendens* is really *'amboinensis'* of the Philippines. Apparently, this is the form which has become established both on Oahu and Tutuila." A similar personal communication from Dr. Belkin to Miss Delfinado dated December 13, 1963 states that ". . . it seems definite that the species originally brought in by Dr. Hu from Manila is what has been called *'amboinensis'* in the Philippines." He further says that "Just why this was originally identified as *splendens* I don't know because the character of the color of the tufts of the 8th abdominal segment of the male is a very good one—red in *splendens,* black in *'amboinensis.'*"

Toxorhynchites brevipalpis (Theobald): This species has been released on all major islands periodically from 1950–1957. Five pupae were collected in abandoned tires at Hana, Maui on September 10 and 11, 1964 by Mr. Joe Duarte. The specimens were taken back to Wailuku, the adults allowed to emerge, and later were sent to the Vector Control Branch, Mosquito Control for identification. This also is a new island record.

Mecopoda elongata (L.): Mr. Shiroma reported that on November 17, 1964 a live specimen of this giant katydid was found on a desk in the Hickam Air base cargo office by Mr. L. Valaria who turned it over to Inspector S. Namiki. An immediate survey of the surrounding area revealed no other specimens. According to the U.S. National Museum, *M. elongata* is of doubtful economic

importance and has been reported from the Orient from India through Japan including the Philippines, Malaya, East Indies, Formosa, and Okinawa. Identification was made by A. B. Gurney.

Hippodamia convergens Guerin: Miss Mabel Chong reported that on September 25, 1964, large numbers of the lady beetle, *H. convergens,* were seen at the Observatory (13,612 ft. altitude) on Mauna Kea, Hawaii by Ernest Yoshioka. This is the second recovery record of this introduced lady beetle for the Big Island. Previously it was recovered on Maui, when Dr. Beardsley collected it at Haleakala Crater, on July 28, 1964.

Asterolecanium robustum Green: Dr. Beardsley reported that this bamboo scale, considered by Miss Louise Russell to be a variety of *A. miliaris* (Boisduval), but treated by Ferris (ATLAS SCALE INSECTS OF NORTH AMERICA 7: 26, 1955) as a distinct species, has not been previously recorded from the Hawaiian Islands. However, Miss Russell has confirmed his identification, as this species, of material which Dr. Beardsley collected on bamboo along the Kokee Road, Kauai, November 4, 1960 and in Honolulu, April 11, 1963.

DAVID TIMMINS FULLAWAY
1880–1964

On December 11, 1964, Dr. David Timmins Fullaway died at his home in Honolulu at the age of 84. The end came suddenly; he had even gone to town alone on the previous day on personal affairs. Thus closed the long, dedicated, and useful career of a prominent American entomologist, 56 years of which were spent in varied entomological research in Hawaii.

Dr. Fullaway was born in Philadelphia, Pennsylvania, September 21, 1880. His early education was in Philadelphia. Upon graduation from high school he enlisted on May 9, 1898 with the Third Pennsylvania Regiment of Infantry Volunteers at Philadelphia and was assigned to Company D, which soon went to the Philippines to participate in the Spanish-American War. He served in the army doing clerical work until October 22, 1898, when by General Order 124 and 130 he was discharged. Returning to the United States, he reenlisted at Philadelphia in the army for a three-year term beginning August 14, 1899, and

served in the Hospital Corps in the Philippines for a period of 2 years, 4 months and 25 days, when he was honorably discharged at Manila on January 7, 1902. Upon discharge he worked in the Office of the Commissioner of Public Health for the Philippines until he returned to the United States to enter Stanford University in September, 1902. His clerical and stenographic talents attracted the attention of Dr. David Starr Jordan, President of Stanford, and he was appointed secretary to the President in 1903. He served as Secretary for the next five years and in addition he carried on his regular studies as a student with a major in entomology.

Dr. Fullaway graduated from Stanford University in 1908 with the degree of Bachelor of Arts, and returned in 1910 to obtain a degree of Master of Arts. In 1962 the University of Hawaii conferred upon him the honorary degree of Doctor of Science. Following graduation from Stanford in June 1908, he accepted an appointment from the U.S. Department of Agriculture as Assistant Entomologist at the Hawaii Agricultural Experiment Station, which at that time was a federal institution with D. L. Van Dine as Chief Entomologist. On March 1, 1909, Van Dine resigned and Fullaway was appointed Entomologist on August 17, 1909. He held this position with distinction until 1912 when he was loaned to the Territorial Board of Agriculture and Forestry to take charge of the rearing and distribution of imported parasites of the Mediterranean fruit fly and the horn fly. His service proved so valuable to the Territory that on May 15, 1913 he was commissioned as Special Collaborator to the Board to take over, on a full time basis, the increasingly important work in the breeding and distribution of imported fruit fly parasites. In 1916 he was placed in charge of the Territorial Division of Entomology and Pathology and in 1926 he assumed the joint position of Territorial Entomologist and Chief Plant Inspector, which he held until retirement on June 1, 1948.

During his long service, entomological problems in Hawaii, especially in the field of biological control of many Hawaiian insect pests, took him to Mexico, the Philippines, China, Japan, India, Java, Singapore, Ceylon, Nigeria, and Guam. Of special importance was his work on the taro leafhopper. In 1937, he succeeded in introducing from the Philippines the mirid bug *Cyrtorhinus fulvus* Knight which fed upon the eggs of this leafhopper. The result has been of great economic importance. During 1916 he made a thorough search in India for parasites of the melon fly, *Dacus cucurbitae* Coquillett and succeeded in importing the braconid larval parasite *Opius fletcheri* Silvestri, which became established. It is of interest that other entomologists in later years have attempted other introductions against this fly without success. In 1914 he went to Africa to obtain parasites of the Mediterranean fruit fly. After several months of work he returned to Honolulu on October 27, 1914, with two important larval parasites of the fly which he had obtained in Nigeria. These were successfully reared in Honolulu by him and liberations were followed by establishment. When insect enemies of the prickly pear cactus were imported into Hawaii from Australia, Fullaway had a large hand in the handling and distribution of these cactus-feeding insects at the great Parker Ranch on the island of Hawaii, much to the appreciation of the ranch management.

About 130 publications by Dr. Fullaway emphasize the breadth of his entomological talents. For many years he was Hawaii's leading authority on the identification of parasitic Hymenoptera, especially the microscopic forms. He has published descriptions of a large number of such insects.

Dr. Fullaway was elected a member of the Hawaiian Entomological Society on November 5, 1908, was President in 1948, and made an Honorary Member on November 14, 1949. He was a faithful attendant at all monthly meetings when he was in Honolulu and even came to his last meeting on November 16, 1964. He became an Associate Member of the American Association of Economic Entomologists in 1909 and an Active Member in 1916. He had the rare distinction of being elected an Honorary Member of the Entomological Society of America on December 3, 1964, only a few days before his death.

Dr. Fullaway was greatly respected by his colleagues, not only for his ability as an entomologist but also because of his natural tendency to make close friendships with all of his associates. In November, 1908, the day before Thanksgiving, he married Edith Beers in Honolulu, whom he had met while a student at Stanford. With her training as a nurse and as a devoted wife she undoubtedly had a large part in preserving his health and congenial nature during his long lifetime. He is survived by his wife, two sons, Capt. Frank L. Fullaway USN (ret.) and William H. Fullaway of Hilo, Hawaii, six grandchildren and four great-grandchildren.

C. E. Pemberton

PUBLICATIONS BY DR. DAVID T. FULLAWAY

Compiled by C. E. Pemberton

1907. Immature Stages of a Psychodid Fly. ENT. NEWS 18(9): 386–389, 2 figs.

1909. Insects of Cotton in Hawaii. HAW. AGR. EXP. STA., BULL. 18: 1–27, 18 figs.
General Insect Notes and Synopsis of Hawaiian Aphididae. ANN. REPT., HAW. AGR. EXP. STA., 17–46, 8 figs.

1910. Geococcus radicum Green in Hawaii. PROC. HAW. ENT. SOC. 2(3): 108–109, 1 pl.
The Sugar Cane Mealybugs. PROC. HAW. ENT. SOC. 2(3): 110.
Description of a New Coccid Species, Ceroputo ambigua, with Notes on its Life History and Anatomy. PROC. DAVENPORT ACAD. SCI. 12: 223–240, 4 pls.

1911. Monograph of the Gall-making Cynipidae of California. ANN. ENT. SOC. AMERICA 4(4): 331–380, 1 pl.
Report of the Entomologist. ANN. REPT., HAW. AGR. EXP. STA., 19–24.
Insects Attacking the Sweet Potato in Hawaii. HAW. AGR. EXP. STA., BULL. 22: 1–22, 10 figs.

1912. Report of the Entomologist. ANN. REPT., HAW. AGR. EXP. STA.: 17–24, 4 figs.
Insects Injurious to Corn. HAW. AGR. EXP. STA., BULL. 27: 1–27, 8 figs.
Insect Pests of the Pineapple in Hawaii. HAW. AGR. EXP. STA., BULL. 36: 31–34, 3 figs. The general bulletin is by J. E. Higgins under the title "The Pineapple in Hawaii."
List of the Aphididae of the Hawaiian Islands. PROC. HAW. ENT. SOC. 2(4): 163–165.
Entomological Notes. ANN. REPT., GUAM AGR. EXP. STA., FOR 1911, 26–35.
Gall-fly Parasites from California. JOUR. NEW YORK ENT. SOC. 20(4): 274–281.

1913. Report of the Entomologist. ANN. REPT., HAW. AGR. EXP. STA.: 16–34, 1 pl. On Mosquitoes.
The Use of Insecticides in Hawaii. PROC. HAW. AGR. EXP. STA., PRESS BULL. 27: 1–8.
Notes on Cynipidae. PROC. HAW. ENT. SOC. 2(5): 191.
Some Notes on Insects in Kona, Hawaii. PROC. HAW. ENT. SOC. 2(5): 218.
Report on a Collection of Hymenoptera Made in Guam, Mariana Islands. PROC. HAW. ENT. SOC. 2(5): 282–290.
Preliminary List of the Hymenopterous Parasites of Coccidae and Aphididae in Hawaii. PROC. HAW. ENT. SOC. 2(5): 215–216.

1913. A New Species of Mealybug Parasite (Aphycus terryi Full.). PROC. HAW. ENT. SOC. 2(5): 281.

1914. A List of Laysan Island Insects. PROC. HAW. ENT. SOC. 3(1): 20–22.
Two New Species of Trichogrammidae. PROC. HAW. ENT. SOC. 3(1): 22–23.
A New Species of Oodemas from Laysan Island. PROC. HAW. ENT. SOC. 3(1): 18.
Report of the Entomologist. ANN. REPT., HAW. AGR. EXP. STA., 18–19.
Tobacco Insects in Hawaii. HAW. AGR. EXP. STA., BULL. 34: 1–20, 9 figs.
Fruit Fly Control. Report of an Expedition to Africa. HAW. FORESTER AND AGRICULTURIST 11: 349–350.

1915. Report of the Breeding and Distribution of the Parasites Introduced by Professor F. Silvestri (For Mediterranean Fruit Fly Control). HAW. BD. OF AGR. AND FORESTRY, BULL. 3: 147–153.

1916. Search for Melon Fly Parasites. HAW. FORESTER AND AGRICULTURIST 13(8): 303–306.
Note on Chrysomyza aenea. PROC. HAW. ENT. SOC. 3(3): 142.

1917. Description of a New Species of Spalangia. PROC. HAW. ENT. SOC. 3(4): 292–294, 1 fig.

1918. Notes on Hawaiian Prosopidae. PROC. HAW. ENT. SOC. 3(5): 393–398.
Notes on Delphacids Collected on a Short Visit to Portions of the Intermediate Forests in Olaa and in North and South Kona, Hawaii. PROC. HAW. ENT. SOC. 3(5): 407–412.
A New Genus of Pteroptricine Aphelininae (Hymenoptera). PROC. HAW. ENT. SOC. 3(5): 463–464.

The Hive Bee (A Manual of Bee Keeping for Hawaii). The Haw. Gazette Co., Ltd.: 36 pages, 10 figs., 11 pls. (This publication is under the name of E. C. Smith, Manager, Garden Island Honey Co. It bears the notation in Dr. Fullaway's handwriting, stating that he prepared it.)

The Corn Leafhopper (Peregrinus maidis Ashm.). HAW. BD. OF AGR. AND FORESTRY, DIV. ENT., BULL. 4: 1–16, 18 figs.

1919. Notes on a Collection of Hawaiian Insects made on the Island of Maui with W. M. Giffard. PROC. HAW. ENT. SOC. 4(1): 50–52.

Description of Paranagrus osborni n.sp. (Hymenoptera, Mymaridae). PROC. HAW. ENT. SOC. 4(1): 53.

Control of the Melon Fly in Hawaii by a Parasite Introduced from India. PROC. THIRD ENT. MEETING, Pusa, 625–629.

Report of the Entomologist. HAW. BD. OF AGR. AND FORESTRY for the Biennial Period Ended Dec. 31, 1918, 54–60.

New Genera and Species of Braconidae, mostly Malayan. JOUR. STRAITS BRANCH, ROY. ASIATIC SOC., No. 80: 39–59.

1920. The Fern Weevil Menace. HAW. FORESTER AND AGRICULTURIST 17(1): 3–4.

The Horn Fly Problem. HAW. FORESTER AND AGRICULTURIST 17 (6): 166–167.

The Melon Fly, its Control in Hawaii by a Parasite Introduced from India. HAW. FORESTER AND AGRICULTURIST 17(4): 101–105.

Termites or White Ants in Hawaii. HAW. FORESTER AND AGRICULTURIST 17: 294–301, 10 pls.

Some Aspects of Economic Entomology in Hawaii. FIRST PAN-PACIFIC SCI. CONG., HONOLULU, 177–179.

Natural Control of Scale Insects in Hawaii. PROC. HAW. ENT. SOC. 4(2): 237–246.

New Species of Sierola with Explanatory Notes. B. P. BISHOP MUS., OCC. PAPERS 7(7): 72–159, 1 pl.

1921. Cryptotermes brevis in Hawaii (Isoptera). PROC. HAW. ENT. SOC. 4(3): 456–457.

Horn Fly Control. HAW. FORESTER AND AGRICULTURIST 18 (10): 219–223, 1 pl.

Insect Problems of the Pineapple Industry. First Annual Short Course in Pineapple Production, Association of Hawaiian Pineapple Canners, 1–9.

The Fern Weevil. HAW. FORESTER AND AGRICULTURIST 18(5): 101–114, 1 pl.

Fig Insect Investigations. HAW. FORESTER AND AGRICULTURIST 18(6): 139–143.

Report of the Entomologist. REPT. BD. AGR. AND FORESTRY, Biennial Period Ended Dec. 31, 1920, 69–73.

1922. Insects Collected at Waimea, Hawaii. PROC. HAW. ENT. SOC. 5(1): 11–12.

Notes on Immigrant Coleoptera. PROC. HAW. ENT. SOC. 5(1): 75–82.

A New Hymenopterous Parasite of the Australian Fern Weevil, Syagrius fulvitarsis Pasc. BULL. ENT. RESEARCH 13: 201.

1923. Report of the Entomologist. REPT. BD. AGR. AND FORESTRY, Biennial Period Ended Dec. 31, 1922, 53–68, 3 figs., 1 color pl.

Some Aspects of Biological Control in Hawaii. JOUR. ECON. ENT. 16: 531–533.

Notes on the Mealybugs of Economic Importance in Hawaii. PROC. HAW. ENT. SOC. 5(2): 305–318.

1924. Notes on Coccinellidae. PROC. HAW. ENT. SOC. 5(3): 371–374.

Insect Collecting in Panama. HAW. FORESTER AND AGRICULTURIST 21: 94–98. (Search for parasites of pineapple mealybug in Panama.)

The Friendly Parasite. MID-PACIFIC MAGAZINE 27(5): 429–433.

1925. Trip to the Orient. HAW. FORESTER AND AGRICULTURIST 22: 115–119. (A report on trip to Japan, China and Formosa for parasites of Adoretus sinicus.)

1926. Termites or White Ants in Hawaii. MID-PACIFIC MAGAZINE 32(5): 417–426.

Termites or White Ants in Hawaii. HAW. FORESTER AND AGRICULTURIST 23: 68–88.

Termites or White Ants in Hawaii, Considered from the Plantation Standpoint. HAW. PLANT. REC. 30(3): 335–349, 13 figs.

A Poisonous Spider in Hawaii. HAW. FORESTER AND AGRICULTURIST 23: 66–68.

A New Species of Fruit Fly Parasite from Formosa (Braconidae). PROC. HAW. ENT. SOC. 6(2): 283.

Termites or White Ants in Hawaii. PROC. THIRD PACIFIC SCI. CONG. 2038–2058.

Some Practical Considerations in Plant Quarantine. PROC. THIRD PACIFIC SCI. CONGR., 1119–1123.

Adoretus sinicus and Its Natural Enemies in the Orient. PROC. THIRD PACIFIC SCI. CONGR., 2086–2090.

1927. Special Report on the Examination of Public School Properties in Honolulu. HAW. FORESTER AND AGRICULTURIST 24: 123–126. (A termite inspection.)

Notes on Litchee Insects. LINGNAN AGR. REV. 4(2): 173–174.

1928. Circular of Information Concerning the Plant Inspection and Quarantine Service. HAW. BOARD OF AGR. AND FORESTRY, 1–20.

1929. Parasites of Pests of Field Crops, Vegetables and Citrus. PROC. FOURTH PACIFIC SCI. CONGR., 593–594.

Report on the Use of Rice Straw as a Packing Material in the Orient. HAW. FORESTER AND AGRICULTURIST 26: 81–82.

Preliminary Report on the Inspection of Territorial Government Buildings in Relation to Damage Caused by Termite Invasion and the Anti-Termite Measures Adopted in Connection Therewith. HAW. FORESTER AND AGRICULTURIST 26: 83–91.

Susceptibility of Avocados of the Guatemala Race to Attack by the Mediterranean Fruit Fly in Hawaii. HAW. FORESTER AND AGRICULTURIST 26 (4): 171–176. (A joint paper with H. F. Willard and Arthur C. Mason.)

1930. Report on Collecting Pineapple Mealybug Enemies in Mexico. HAW. FORESTER AND AGRICULTURIST 27: 215–216.

1931. Some Aspects of Biological Control in Hawaii. MID-PACIFIC MAGAZINE 42(4): 339–340.

1932. Synopsis of the Hawaiian Diaspinae (Coccidae). PROC. HAW. ENT. SOC. 8(1): 93–110.

1933. Recent Advances in Knowledge of Insect Fauna of South Sea Islands. PROC. FIFTH PACIFIC SCI. CONGR. 5: 3383–3384.

1933. A New Thripoctenus Parasite from the Philippines. PROC. FIFTH PACIFIC SCI. CONGR. 5: 3439–3444.

1934. New Species and Varieties of Sierola from the Marquesas. B. P. BISHOP MUS. BULL. 114: 357–363.

1936. Description of a New Fruit Fly Parasite from Fiji. PROC. HAW. ENT. SOC. 9(2): 179–180.

1937. Hawaii's Fruit Fly Problem. PARADISE OF THE PACIFIC 49(2): 23, 31–32.

Notes on the Taro Leafhopper (Megamelus proserpina Kirk.) (Delphacidae). PROC. HAW. ENT. SOC. 9(3): 405–406.

On the Genus Echthromorpha (Hymenoptera). PROC. HAW. ACADEMY OF SCIENCE, B. P. BISHOP MUS., SP. PUB. 31: 1 page.

1938. Orchid Insects. PROC. HAW. ENT. SOC. 10(1): 45–49.

New Species from the Bishop Museum Collection of Samoan Parasitic Hymenoptera. PROC. HAW. ENT. SOC. 10(1): 49–52.

1939. New Species of Proctotrupid Wasps from the Bishop Museum Collection of Samoan and Fiji Insects. PROC. HAW. ENT. SOC. 10(2): 209–221.

An Account of the Reduction of the Immigrant Taro Leafhopper (Megamelus proserpina) Population to Insignificant Numbers by the Introduction and Establishment of the Egg-sucking Bug Cyrtorhinus fulvus. PROC. SIXTH PACIFIC SCI. CONGR. 4: 345–346.

1940. New Species from the Bishop Museum Collection of Samoan Parasitic Hymenoptera. PROC. HAW. ENT. SOC. 10(3): 399–410.

A New Egg Parasite of the Taro Leafhopper. PROC. HAW. ENT. SOC. 10(3): 411–412.

Paradichlorebenzene Emulsion for Crayfish Control. PROC. HAW. ENT. SOC. 10(3): 413.

1941. A Check List of the Parasitic Hymenoptera of the Samoan Islands with Descriptions of New Species Appended. PROC. HAW. ENT. SOC. 11(1): 41–49.

1942. A List of Parasitic Hymenoptera Collected by F. X. Williams in New Caledonia. PROC. HAW. ENT. SOC. 11(2): 243–247.

1944. Description of a New Mymarid Egg Parasite Collected at Los Mochis, Sinaloa, Mexico. PROC. HAW. ENT. SOC. 12(1): 57.

1945. Common Insects of Hawaii. Tongg Publishing Company: 1–228, 16 figs., 12 pls. By D. T. Fullaway and N. L. H. Krauss.

1946. Coccidae of Guam. B. P. BISHOP MUS., BULL. 189: 157–162.
Ichneumonidae, Evaniidae and Braconidae of Guam. B. P. BISHOP MUS., BULL. 189: 221.
New Species of Guam Chalcidoidea. B. P. BISHOP MUS., BULL. 189: 201–210.

1947. Niihau Insects. PROC. HAW. ENT. SOC. 13(1): 51–53.

1949. A New Species of Opius from the Philippine Islands. PROC. ENT. SOC. WASHINGTON 51(3): 114–115, 1 fig.

1950. Notes on Parasites of Tephritid Flies. PROC. HAW. ENT. SOC. 14(1): 23–28.
Agonoxena argaula Meyr. in Samoa. PROC. HAW. ENT. SOC. 14 (1): 63–64.

1951. Review of the Indo–Australasian Parasites of the Fruit Flies (Tephritidae). PROC. HAW. ENT. SOC. 14(2): 243–250.

1952. Biological Control of Insect Pests in the Hawaiian Islands Since 1925. REPT. BD. AGR. AND FORESTRY, Biennial Period Ended June 30, 1952, 98–105.
New Species of Opius (Hymenoptera, Braconidae). PROC. HAW. ENT. SOC. 14(3): 411–413.

1953. The Oriental Fruit Fly in Hawaii. PROC. SEVENTH PACIFIC SCI. CONG. 4: 148–163.
New Species and Varieties of Opius. PROC. ENT. SOC. WASHINGTON 55 (6): 308–314.
Three New Species of Eurytoma (Hymenoptera, Eurytomidae). PROC. HAW. ENT. SOC. 15(1): 33–36.
Two New Diaspidid Scales on Araucaria. PROC. HAW. ENT. SOC 15(1): 87–91, 2 pls. (A joint paper with Marian S. Adachi.)

1954. Biological Control of Cactus in Hawaii. JOUR. ECON. ENT. 47(4): 696–700.

1955. Description of a New Genus and Species of Parasitic Wasp (Hymenoptera, Eulophidae). PROC. HAW. ENT. SOC. 15(3): 409–410.

1956. Biographical Eketch of Dr. R. C. L. Perkins. PROC. HAW. ENT. SOC. 16(1): 45–46.
New Species of Hymenoptera. PROC. HAW. ENT. SOC. 16(1): 40–44.

1957. A New Reared Opius from Africa. PROC. ENT. SOC. WASHINGTON 59(3): 98–99.
Check List of the Hymenoptera of Fiji. PROC. HAW. ENT. SOC. 16(2): 269–280.

1958. Importations of Natural Enemies of the Weed Emex spinosa Campd. PROC. HAW. ENT. SOC. 16(3): 359–360.

1961. Forest Insects in Hawaii. PROC. HAW. ENT. SOC. 17(3): 399–401.

SALE OF BACK NUMBERS

A limited supply of most of the back numbers of the PROCEEDINGS OF THE HAWAIIAN ENTOMOLOGICAL SOCIETY is available and may be purchased from the Society at the following prices:

Vol. 1, nos. 1-5 (1906–1908)	$1.00	per number
Vol. 2, no. 1 (1908)	1.00	" "
Vol. 2, nos. 2–5 (1909–1913)	5.00	" "
Vol. 4, nos. 2–3 (1920–1921)	5.00	" "
Vol. 5, nos. 1–3 (1922–1924)	5.00	" "
Vol. 6, nos. 1–2 (1925–1926)	5.00	" "
Vol. 7, nos. 1–3 (1928–1931)	5.00	" "
Vol. 8, nos. 2–3 (1933–1934)	5.00	" "
Vol. 9 through 17; each volume contains three numbers (1935–1961)	5.00	" "
Vol. 18, nos. 1–2 (1962–1963)	5.00	" "
Vol. 18, no. 3 (1964)	5.50	" "

The following numbers are out of print: Vol. 3, nos. 1–5 (1914–1918); vol. 4, no. 1 (1919); vol. 6, no. 3 (1927); vol. 8, no. 1 (1932).

Indices are available with purchase of entire volumes.

Orders from outside the United States must be prepaid and shipments to foreign countries are made at the purchaser's risk.

Orders should be addressed to the Secretary, Hawaiian Entomological Society, 1527 Keeaumoku St., Honolulu, Hawaii 96822, U.S.A.

NEW IMMIGRANT RECORDS FOR THE YEAR 1964

Species marked with an asterisk were reported from the Hawaiian Islands for the first time during 1964 on the dates recorded in the text. Species not so marked were reported previously under incorrect or incomplete determinations. Species marked with a dagger are considered doubtfully established as the records are based on a single collection. New species considered to be endemic to the Hawaiian Islands are not included in this list.

CHANCE IMMIGRANTS

BENEFICIAL INSECTS PURPOSELY INTRODUCED

OFFICERS FOR 1964

President.....Martin Sherman
President-elect.....Wallace C. Mitchell
Secretary.....Setsuko Nakata
Treasurer.....Harry Nakao
Advisor.....C. E. Pemberton
Editorial Committee.....Amy Suehiro, *Editor*, R. D. Anderson, J. W. Beardsley, C. R. Joyce, H. Kamasaki
Finance Committee.....C. F. Clagg, *Business Manager*, H. Nakao, M. Tamashiro, J. Kim
Program Committee.....C. E. Pemberton, *Chairman*

HONORARY MEMBERS

Walter Carter
Q. C. Chock
C. P. Clausen
D. T. Fullaway*
C. E. Pemberton
P. H. Timberlake
R. H. Van Zwaluwenburg
F. X. Williams

MEMBERSHIP 1964

Abramovitz, Melvin
Anderson, R. D.
Aoki, Junichi
Arnaud, P. H., Jr.
Ashlock, P. D.
Au, Stephen
Balock, J. W.
Beardsley, J. W.
Bess, H. A.
Bianchi, F. A.
Boyle, W. W.
Bryan, E. H., Jr.
Butler, G. D., Jr.
Callan, E. McC.
Chanthawanich, Niphan
Chilson, L. M.
Chong, Mabel
Christensen, L. D.
Chujo, M.
Clagg, C. F.
Clagg, H. B.
Cunningham, R. T.
Davidson, E. H.
Davis, C. J.
Delfinado, M. D.
Dizon, Romeo
Dyson, G. W.
Einmo, J. R.
Faxon, Richard
Forster, R. R.
Fujimoto, Martin
Funasaki, G.
Gaddis, C. H.
Ganesalingam, N. K.
Garcia y Martell, Celso
Ghani, M. A.
Gressitt, J. L.
Gubler, D.
Haas, G. E.
Habeck, D. H.
Hagen, K. S.
Hamilton, D. C.
Haramoto, F. H.
Hardy, D. E.
Harrell, J. C.
Harris, E. J.
Hart, W. G.
Hinckley, A. D.
Holway, R. T.
Holzapfel, E.
Hoyt, C. P.
Hu, Benjamin
Huang, Yiau-Min
Ikeda, James
Ishii, Takashi
Ito, Kiyoshi
Joyce, C. R.
Kajiwara, J. T.
Kamasaki, Hitoshi
Kawanishi, Clinton
Keck, C. B.
Khaing, Aye Aye
Kim, James
Kimoto, Shinsaku
Kohn, Marian A.
Komatsu, George

* Deceased

Krauss, N. L. H.
Kunishi, Robert
Laigo, Francisco
Lamprecht, Herbert
Leech, Robin
Leong, Kingston
Look, W. C.
Lupton, D. W.
Maa, T. C.
Madinger, F. L.
Maehler, K. L.
Matsumoto, Barton
McEwen, Freeman
McMahan, E. A.
Messenger, P. S.
Mitchell, C. J.
Mitchell, Sue
Mitchell, W. C.
Miyahira, Nobuo
Miyatake, Yorio
Miyazaki, Satoru
Nagatomi, Akira
Nakagawa, P. Y.
Nakagawa, Susumu
Nakao, Harry
Nakata, Setsuko
Namba, Ryoji
Neff, Norman
Newell, I. M.
Nishida, Toshiyuki
Nowell, W. R.
Ohinata, Kiichi
Ota, Asher
Owen, R. P.
Ozaki, E. T.
Park, Robert
Perkins, B. D., Jr.
Peterson, G. D., Jr.
Quate, L. W.
Raheja, A. K.
Rainwater, H. Ivan
Ross, M. M.
Rutschky, Charles
Sakimura, Kanjyo
Samuelson, G. A.
Sanchez, F. F.
Sasakawa, Mitsuhiro
Sato, Carl
Shahjahan, Mohammed
Sherman, Martin
Shiroma, E. S.
Sholdt, L.
Silva, Pedrito
Spencer, N. R.
Steffan, Wallace
Steiner, L. F.
Stone, W. E.
Strandtmann, R. W.
Suehiro, Amy
Sugerman, B. B.
Suman, T. W.
Tamashiro, Minoru
Tanabe, Alvin
Tanada, Yoshinori
Tenorio, J. A.
Thistle, Alan
Thomas, Elizabeth
Thornley, H. F.
Thornton, I. W. B.
Toba, H. S.
Tsuda, D. M.
Tuthill, L. D.
Usinger, R. L.
Voss, W. J.
Wilson, Nixon
Wilton, D. P.
Wirth, W. W.
Wise, K. A. J.
Wolfenbarger, D. O.
Woolford, H. A.
Yano, Koji
Yasumatsu, Keizo
Yoshimoto, C. M.
Yoshioka, Ernest
Yukawa, Junichi
Zeigler, E. O.
Zimmerman, E. C.