PROCEEDINGS of the HAWAIIAN ENTOMOLOGICAL SOCIETY for 1962

VOL. XVIII, No. 2
JULY, 1963

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 (8½ 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 (4½ 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. XVIII, No. 2 FOR THE YEAR 1962 JULY, 1963

JANUARY 15, 1962

The 673rd meeting of the Hawaiian Entomological Society was called to order by President Rainwater at 2:05 p.m., Monday, January 15, 1962, at the Experiment Station, HSPA.

Members present: Anderson, Beardsley, Bess, Bianchi, Carter, Chock, Chong, Clagg, Davis, Fullaway, Habeck, Hardy, Joyce, Kajiwara, Kim, Krauss, Lofgren, Look, Matsumoto, Miyatake, Nakao, Nakata, Namba, Nishida, Pemberton, Phillips, Rainwater, Suehiro, Sugerman, Thistle, and Woolford.

Visitors: Dr. Emil Bogen and Mr. Melvin Abramovitz.

Dr. Carter, representing the Society at the State Park Conference, reported on the activities of that group.

Mr. Thistle reported on the amendment of air pollution regulations proposed by the Environmental Health Division of the State Department of Health. After some discussion of the proposed regulations, a committee was appointed to study the proposed amendment and take whatever action it deemed necessary on behalf of the Society.

NOTES AND EXHIBITIONS

Mr. Krauss presented the following notes:

Hypena strigata Fabricius: The Commonwealth Institute of Entomology, London, advises that further study of the noctuid moth known in Hawaii as *H. jussalis* Walker shows it to be *H. strigata* Fabricius. This species was introduced into Hawaii from southern Rhodesia and Kenya in 1957, and is now well established and causing severe defoliation of *Lantana camara aculeata.*

Aceria lantanae (Cook): Eriophyid galls causing severe damage to flower heads of *Lantana camara mista* at Boca del Rio, Veracruz, Mexico, November 21, 1962, and *L. camara* flower heads at Cali, Colombia, November 10, 1961 were exhibited by Mr. Krauss. This mite is widely distrib-

uted in tropical America where it forms conspicuous galls on lantana flowers and leaves.

Cook Islands Heteroptera: The following insects, collected on Aitutaki Island, Aitutaki Atoll, Cook Islands, in February 1960, have been identified by R. C. Froeschner, U. S. Entomology Research Division as follows:

Nezara viridula (Linnaeus), Pentatomidae
Pachybrachius pacificus (Stål), Lygaeidae
Nabis sp.?, Nabidae
Cyrtopeltis nicotianae Konigsberger, Miridae

Catabena esula Druce: For Mr. Yoshioka, Mr. Krauss reported that this noctuid caterpillar was found in very large numbers feeding on lantana plants at Kohala, Hawaii, in January, 1962. Over 50 larvae were seen on one plant which was about a foot high, and many plants were completely denuded of foliage by *Catabena* and *Hypena strigata* F. larvae.

Gerrohonatus multicarinatus (Blainville) (alligator lizard): Mr. Kim exhibited a lizard which was found alive by an employee of the Ordnance section, Schofield Barracks, December 12, 1961, in a warehouse on a vehicle which had been shipped in recently. This species is found from California north to Vancouver, Canada. It is listed as a host of the immature stages of *Ixodes* spp. which are multihost ticks particularly annoying to the host because the very large mouthparts cause extreme irritation. These ticks are known vectors of several important diseases such as anaplasmosis and "tick-borne fever" of sheep. Several species of *Ixodes* were found recently on dogs at the State Animal Quarantine Station. (See Report of the Department of Agriculture, Fiscal Period ending June 30, 1961.)

The following notes were presented by Mr. Beardsley:

Gyranusa n. sp.: This determination was received from Mr. P. H. Timberlake, University of California, Riverside, for specimens of an encyrtid parasite reared from specimens of the Mexican mealybug (*Phenacoccus gossypii* Townsend and Cockerell) collected on *Crotalaria* at Mapulehu, Molokai, on November 6, 1961. Mr. Timberlake wrote that the *Gyranusa* sp., though similar to *G. claripennis* Timberlake, was quite distinct.

This parasite appears to have been in Hawaii for a number of years although previously collected here but once. Fullaway ["PROCEEDINGS" 15 (1):11, 1946][1] reported rearing an encyrtid which he determined as *Gyranusoidea* sp. from an undetermined mealybug on Oahu in 1945. Comparison of the *Gyranusa* sp. specimens with those reared by Fullaway show them to be identical. This is the first parasite of *Phenacoccus*

[1]Throughout this publication, "PROCEEDINGS" refers to PROCEEDINGS OF THE HAWAIIAN ENTOMOLOGICAL SOCIETY.

gossypii to be reported from Hawaii and a new island record for the *Gyranusa* sp.

Apoanagyrus californica Compere: Two specimens of this immigrant encyrtid wasp were collected sweeping roadside vegetation at Ewa, Oahu, on January 9, by Mr. Beardsley. This species was reported here once previously ["PROCEEDINGS" 16 (2) :186, 1957] from specimens collected near Koko Head, Oahu, in 1934 by O. H. Swezey. In California this species is reportedly a parasite of *Phenacoccus solani* Ferris and presumably attacks the same host in Hawaii, although it has not been reared.

Hyperaspis limbalis Casey: A single specimen of this coccinellid bettle was collected on *Atriplex* at Ewa, Oahu, on January 9. This species has been reported once previously (incorrectly as "*H. limbatus*") from specimens collected near Lahaina, Maui, in 1954 ["PROCEEDINGS" 15 (3) :385, 1955], and it probably was purposely introduced into Hawaii in 1906 by Koebele. *H. limbalis* was described from California (JOUR. NEW YORK ENT. SOC. 7:126, 1899). This is a new island record for the species.

Monoxia sp., possibly **minuta** Blake: This determination for the small chrysomelid beetle reported at the December 1961 meeting as *Monoxia* sp. was provided Mr. Beardsley by G. B. Vogt of the U. S. National Museum. During the past month about 20 specimens were collected by sweeping *Atriplex semibaccata* along a road on Ewa Plantation, near Barbers Point, Oahu, and larvae of the beetle were leafminers on this plant.

Protalebrella brasiliensis (Baker): Dr. Joyce reported that evidence indicates that this leafhopper has become established in Hawaii. Two single light-trap records were previously reported, September 30, 1960, and July 17, 1961; during the past month five specimens were taken in a light trap and three by sweeping grass and weeds at the Public Health Service Quarantine Station, Honolulu. As the insect builds up in numbers it will probably move out into other areas.

Aedes vexans nocturnus (Theobald): One female of this species was found by Dr. Joyce in a light trap at the Public Health Service Quarantine Station, Honolulu, January 2, 1962. Steps were immediately taken to determine how the mosquito arrived and whether it is established in Hawaii. Larval surveys of the harbor and airport areas to date have failed to disclose any breeding. It is thought that the specimen may have been a stray off some ship or aircraft and is not established here.

Brown spots on anthuriums: Dr. Hardy reported that several months ago specimens of anthurium leaves covered with small brown spots were sent to the entomology department from a flower grower in Hilo to determine the cause of the spotting. The small, brown, rather symmetrical, raised spots scattered over the leaves looked very much like small scale insects, but upon closer examination seemed to resemble insect defecation spots. Since that time, numerous samples of heavily

spotted leaves and stems from various plants have been received. This condition has caused much concern among the flower growers since the affected flowers are non-salable. As the spots resembled droppings from blow flies most closely, it was assumed that this spotting occurred where chickens or some other animals were being raised nearby, and that probably large populations of flies were resting on the leaves of the affected plants. Dr. Nishida made an inspection trip to Hilo the latter part of December and was unable to find any flies or other insects in great enough abundance to account for this condition. Though the cause of the spotting is still a puzzle, Dr. Nishida did find, however, that it seems to be definitely connected with the use of bagasse as a mulch under the plants, although at the present time there is no explanation for this.

Nezara viridula smaragdula (Fabricius): Dr. Hardy noted that the southern green stink bug is now well established in the Kaimuki area and has also been reported from Makaha Valley in the Waianae area.

Achaetoneura archippivora (Williston): Mr. Clagg reported for Mr. Einmo that tachinid flies determined as *archippivora* emerged from *Spodoptera mauritia* (Boisduval) larvae infesting two-year-old Bermuda grass lawns in the navy's Manana Capehart housing near the north edge of the middle loch of Pearl Harbor. Twenty-five full-grown larvae were collected from various lawns on December 18, 1961, and divided five to a jar to study parasitism. After 22 days, 54 adult tachinid flies emerged from 56 fly puparia; two of the puparia were shriveled. No *Spodoptera* larvae pupated, therefore, all were apparently parasitized and biological control of the next generation was satisfactory without the added cost of chemical spraying.

At the Marine Corps Air Station in Kaneohe, only one moth emerged out of 20 lawn armyworm larvae collected, and an average of 1.2 tachinid flies emerged from each *Spodoptera* larva collected. No other parasites emerged. This biological control can save about $150 per day which is being spent now at three large naval activities for labor and chemicals to spray lawn armyworms.

Chiracanthium diversum Koch: Mr. Clagg also reported that on December 14, 1961, a service man living in the Navy Housing at Halsey Terrace near Salt Lake, Oahu, was bitten on the arm as he was sleeping, by what he thought was a black widow spider. His arm began to swell and he reported to the Pearl Harbor Naval Shipyard Dispensary for treatment. Upon examination the spider was found to be not a black widow, but *Chiracanthium diversum* Koch which has been reported to inflict painful bites on people. The pain at the site where the venom was injected disappeared in 2 hours though the swelling of the arm lasted for about 12 hours.

Xyleborus morstatti Hagedorn*: Mr. Davis gave an interesting report on the coffee-twig borer, *Xyleborus morstatti* Hagedorn, which is the most recent insect pest discovered on Oahu. Considered a serious pest of coffee in French Guinea, it is recorded elsewhere as follows: West Africa, widely distributed in the tropical areas, chiefly on coffee but also on mango, cacao, and *Bauhinia tomentosa* (tree orchid); East Africa, on coffee, *Erythrina*, and *Melia azedarach*; Madagascar, on coffee; Mauritius and Seychelles, on avocado; India (Mysore), on coffee or, if it does not breed on coffee, reported on *Crotalaria* and *Clerodendron*; Indochina, on coffee; Java and Sumatra, on coffee, oil palm (*Elaeis*), mahogany, coca (*Erythroxylon coca*), *Dendrobium veratrifolium*, and *Sambucus canadensis* (elderberry); Fiji, on avocado.

The following hosts have been recorded in Kailua, Oahu: pink tecoma, *Tabebuia pallida*; vitex, *Vitex trifolia*; *Pittosporum tobira*; hibiscus, *Hibiscus* sp.; star jasmine, *Jasminum pubescens*; *Jasminum* sp.; pikake, *Jasminum sambac*; periwinkle, *Vinca* sp.; surinam cherry, *Eugenia uniflora*; eldorado, *Eranthemum eldorado*.

X. morstatti was identified by Dr. Stephen Wood, scolytid specialist at Brigham Young University, Provo, Utah. It is a tiny black beetle about the size of a pinhead. The female bores into live twigs and lays its eggs in niches; the larvae work into the pith of live stems, and all stages may be found at the same time.

A single specimen from Foster Gardens, Honolulu, compares favorably with identified material from Kailua but additional material must be examined before this can be confirmed.** Preliminary surveys indicate that it apparently is not present on neighbor islands. To protect the coffee industry on Hawaii, a ban on the movement of all woody plants to that island was imposed. The movement of woody plants to islands other than Hawaii is subject to precautionary atmospheric fumigation with methyl bromide, vacuum fumigation if found infested.

Muller (1933) states that an ambrosia fungus of the monilia type is associated with *X. morstatti* and with three other species of *Xyleborus* in the Netherlands Indies. Mr. Koike of the Plant Pathology Department obtained a fungus, *Fusarium* sp., from pink tecoma twigs, and University pathologists are currently studying the fungus relationships. A preliminary search of the literature for natural enemies indicates that *X. morstatti* is parasitized by a species of *Tetrastichus*. According to a report of the Boesoeki Experiment Station, Java, for 1932 ". . . *Xyleborus morstatti* (black twig borer) was less harmful than in the preceding year. In its spread, it was accompanied by the parasite *Tetrastichus* from the brown twig borer (*X. morigerus*) that has adapted itself to it" (REV. APPLIED ENT. SER. A. 20:567, 1933).

*Recently identified as a synonym of *X. compactus* Eichh. (Ent. Bericht. 22:247, 1962).

**Confirmed by Dr. Stephen Wood.

FEBRUARY 2, 1962

The 674th meeting of the Hawaiian Entomological Society was called to order by President Rainwater at 2 p.m., Monday, February 12, 1962, at the Experiment Station, HSPA.

Members present: Abramovitz, Anderson, Bess, Bogen, Chong, Davis, Fullaway, Gressitt, Hardy, Haramoto, Kajiwara, Kawanishi, Komatsu, Lofgren, Look, Matsumoto, Miyatake, Nakata, Namba, Nishida, Pemberton, Perkins, Phillips, Rainwater, Sanchez, Sherman, Steiner, Suehiro, Tamashiro, Wilton, Woolford.

Visitors: Mr. E. S. Shiroma, Dr. Heinrich Holtmann.

Dr. Hardy reported that the committee on common names of insects rejected the name cypress roach for *Diploptera punctata* (Eschscholtz) and proposed the use of beetle cockroach. No objections to this new name were raised by Society members. Dr. Hardy pointed out that this roach has been known as *Diploptera dytiscoides* (Serville) but that this name was synonymized by K. Princis (1950, OPUS. ENT. 15:161–168).

Mr. Davis reported that the summary of pest conditions in Hawaii for 1961 has been completed and submitted to Washington and will be published soon.

Dr. E. Bogen and Mr. M. Abramovitz were unanimously elected to membership in the Society.

Dr. Bess showed an interesting set of colored slides of "Larry, the leafminer." These humorous cartoon-style pictures illustrate the life history of *Leucoptera meyricki* Ghesquiere, a leaf-mining lyonetiid which is the most serious pest of coffee in Kenya.

Dr. Gressitt gave an interesting illustrated talk on the entomological activities carried on at Campbell Island. The nets used for trapping airborne insects were illustrated and discussed, as well as the terrain, animals, and birds of this island. In addition, he showed several slides of the insect trap mounted in the Super Constellation which flew between Christchurch, New Zealand and Antarctica.

NOTES AND EXHIBITIONS

Bishop Museum Field Work: Dr. Gressitt reported that a new field project supported by the Army and primarily concerned with ectoparasites of native mammals and birds was started in Taiwan in January. Field work will be carried on in the Philippines, starting in March; with the main party concentrating on Palawan and nearby islands. The museum's field station in New Guinea has been augmented with additional personnel.

Mr. Davis presented the following notes:

Telenomus basalis Wollaston: The first shipment of *T. basalis*, an egg parasite of the southern green stink bug, *Nezara viridula smaragdula*, was received from Australia on February 6 and consisted of approximately

2000 scelionids. These were released on yard-long beans on the north rim of the old quarry, University of Hawaii. Subsequently, 3000 additional parasites were released at Makaha Valley, Waianae, where large adult and nymph populations were observed on ears of corn, okra, spiny amaranth, beans, and other hosts.

T. basalis was sent through the cooperation of Dr. Douglas Waterhouse, Chief, Division of Entomology, C.S.I.R.O., Canberra, Australia.

Cinara sp.: A very heavy infestation of this coniferous twig aphid was observed on loblolly saplings, *Pinus taeda* at the Olinda tree nursery, Maui, on January 16. The needles of many of the infested branches were yellow, and some saplings appeared to have been killed. The aphid was identified by Dr. F. Hottes, who feels that this may be a new species. This appears to be the second twig- and bark-infesting aphid to become established in Hawaii.

MARCH 12, 1962

The 675th meeting of the Hawaiian Entomological Society was called to order by President Rainwater at 2:05 p.m., Monday, March 12, 1962, at the Experiment Station, HSPA.

Members present: Anderson, Beardsley, Bess, Bianchi, Bogen, Chong, Clagg, Davis, Fullaway, Gressitt, Habeck, Haramoto, Hardy, Joyce, Kajiwara, Kim, Komatsu, Krauss, Lofgren, Look, Matsumoto, C. Mitchell, Nakata, Nishida, Pemberton, Perkins, Phillips, Quate, Rainwater, Sakimura, Shiroma, Steiner, Suehiro, Tamashiro, Wilton, and Woolford.

Visitors: Dr. Nixon Wilson, Mr. Wallace Steffan, Mr. Barry Pullen, Mr. Mervyn Arthur, Miss Shuch-shiang Huang, and Mr. Takashi Ishii.

Dr. Bess, ISSEC representative, reported on the activities of this Council in promoting science in Hawaii.

Mr. E. S. Shiroma was elected to membership in the Society.

The members voted unanimously that the Society pay $2.00 yearly dues and continue as a member of the Conservation Council of Hawaii.

The Wish award for the most meritorious science fair project in entomology was discussed. The members voted that the Committee selecting the winner be allowed to spend up to $10.00 on the book or equipment the winner chooses.

Mr. Krauss gave a very interesting talk on his recent trip to New Caledonia and Tahiti. He discussed the terrain and people of these islands, as well as entomological problems and the work of the South Pacific Commission.

NOTES AND EXHIBITIONS

Syagrius fulvitarsis Pascoe and **Trioza hawaiiensis** Crawford: Dr. Bess reported that he and Mr. Davis spent some time in the Volcano area of the Hawaii Volcanoes National Park on February 26 and 28 and were impressed by the abundance of the fern weevil on the amaumau fern, *Sadleria cyatheoides* Kaulfuss, and of the psyllid on ohia lehua, *Metro-*

sideros collina polymorpha (Gaudichaud) Rock. In August and September 1952, Dr. Bess spent four weeks in the Park studying, primarily, the populations, distribution, and damage caused by the fern weevil and its parasitization by *Doryctes syagrii* (Fullaway), introduced in 1921 from Australia by Dr. Pemberton. In 1952 the weevil was causing mortality of plants in localized areas near Kilauea Iki and plants are still being killed in this general area of the Park, though in much of the area infested with the weevil, plants are apparently seldom or never killed. The recent eruption in Kilauea Iki killed many ferns and ohia lehua trees nearby in the area known as the Old Summer Camp. Apparently, the cinders contained nutrient materials, for on the periphery of the area devastated by the heat, both the ferns and ohia lehua appear to flourish and over the past several months severe infestations of the weevil and psyllid have developed. The parasite of the weevil is also abundant in the area.

Mr. Beardsley gave the following six notes:

Anthicus tobias Marseul: Among anthicid specimens studied by Dr. F. G. Werner were specimens from Oahu which had been misidentified here previously as *Anthicus mundulus* Sharp; local records of *A. mundulus* should be referred to *A. tobias* [PSYCHE 68 (2–3) :70–73, 1961].

Corythuca morrilli Osborn and Drake: A single dead specimen of this introduced tingid bug was found in a spider web near the summit of Lanaihale, Lanai, on January 4. This appears to be a new island record for this bug.

Crawforda triopsyllina Caldwell: Mr. Beardsley and Dr. Hardy found adults and nymphs of this psyllid abundant on a *Tetraplasandra hawaiiensis* tree growing near the road to Lanaihale, Lanai, at about 2,500 ft. altitude, on January 4. This psyllid, described from a single large collection made by Dr. Swezey on Molokai in 1927 on *Tetraplasandra*, does not appear to have been taken again until the present collection. This constitutes a new island record for the species. The psyllid was identified by Dr. Tuthill and the host plant by Miss Marie C. Neal.

Hysteroneura setariae (Thomas): Several alate adults of this recent immigrant aphid were found on sugarcane leaves at Mapulehu, Molokai, on January 3. This is a new island record for the rusty plum aphid, which has been collected previously in Hawaii only on Oahu.

Mass flight of sciarid midges at Naalehu, Hawaii: A visit was made to Naalehu, Kau District, Hawaii, at the request of the Hutchinson Sugar Company to investigate a nuisance problem created there by astronomical numbers of gnats in the town of Naalehu and nearby areas during the last week of January and the first week of February. Owing to their small size and attraction to light, great numbers of midges entered houses, becoming nuisances by falling into food and by obscuring TV screens. They were reported to have been so numerous on the road between Naalehu and Pahala that they obscured headlights and coated windshields of vehicles.

Specimens collected during the mass flights, as well as some reared from larvae collected during Mr. Beardsley's visit, were determined by Dr. Hardy as *Sciara garretti* Shaw, *S. spatitergum* Hardy, and *S. radicum* Brunetti (?). Larvae were very abundant in moist disturbed soil in several cattle paddocks in the vicinity of Naalehu. The infested soils contained a very rich mixture of cow manure and fodder. In areas where soil was dry or hardpacked, sciarid larvae were scarce or absent. Apparently, a period of soaking rains, which created favorable soil moisture conditions, followed by a period of still weather at the time of emergence of the adult gnats resulted in the development of large gnat populations. The evening of February 9 was spent in Naalehu in hopes of witnessing the mass flights of the gnats, but the weather was unusually breezy and for the first time in several evenings very few midges appeared.

Salmacia longipulvilli (Tothill): This immigrant tachinid fly was very abundant flying low over the ground in bright sunshine at Pohakuloa, 6,000 ft. altitude, in the "Saddle" area of Hawaii on February 10. The most likely hosts for these flies found in the area are various species of cutworms, one of which, *Agrotis ipsilon* (Hufnagel) was fairly common under rocks.

Bishop Museum Entomology Department: Dr. Gressitt reported that Bishop Museum has received new invitational grants considerably increasing operations. Two field teams will be operating simultaneously in New Guinea, and one in the Philippines and later in Borneo.

Volucella tamaulipana Townsend: Dr. Hardy noted that *Volucella tamaulipana* Townsend (1898, JOUR. NEW YORK ENT. SOC. 6:51) is the correct name for the species which has been referred to in Hawaiian literature as *V. pusilla* Macquart.

Nezara viridula smaragdula (Fabricius): Specimens of a dark-color form were exhibited by Dr. Hardy. Predominantly dark-colored populations have been reported from several areas around Honolulu.

APRIL 9, 1962

The 676th meeting of the Hawaiian Entomological Society was called to order by President Rainwater at 2:08 p.m., Monday, April 9, 1962, at the Experiment Station, HSPA.

Members present: Abramovitz, Anderson, Beardsley, Bess, Bianchi, Carter, Chock, Chong, Davis, Gressitt, Habeck, Hardy, Joyce, Kawanishi, Look, Maehler, Matsumoto, C. Mitchell, Miyatake, Namba, Nakata, Pemberton, Perkins, Pullen, Quate, Rainwater, Ross, Shiroma, Steffan, Suehiro, Sugerman, Tamashiro, Wilson, Woolford, Yoshimoto, and Ziegler.

Visitors: Mr. Mervyn Arthur, Mr. Harry Clagg, Mr. Alvin Chock, Mr. Takashi Ishii, Miss Shuch-shiang Huang, Dr. Maurice T. James, Mr. Frank Madinger.

Mr. Marshall Ross reported for the Hawaiian Science Fair committee that the unanimous selection for first place was the project "What effect do stimulants have on the spider's web?" by Miss Ann Matsumoto, age 14, a ninth grader at Dole Intermediate School. Mr. Rainwater presented the award to her at the Science Fair banquet on Saturday, March 24.

Dr. Carter reported on the State Parks Conference which he attended as the Society's delegate.

Dr. Heinrich Holtmann, Mr. Barry Pullen, Mr. Wallace Steffan, Dr. Nixon Wilson, and Mr. E. O. Ziegler were elected to membership in the Society.

Mr. Ken Maehler, head of Plant Quarantine for the Western States and Hawaii, gave an interesting talk on his experiences as an entomologist.

NOTES AND EXHIBITIONS

Aedes vexans nocturnus (Theobald): Dr. Joyce reported that one female of this new immigrant mosquito was taken in a light trap at Kapaa, Kauai, on April 5. This represents the first recovery of the mosquito on an outer island since its discovery on Oahu on January 2, 1962. The trap is one of 12 being operated at various points on Kauai by the Mosquito Control, Vector Control Branch, of the State Department of Health.

Macrocentrus calacte Nixon: Mr. Beardsley reported that he had recently received this determination from C. F. W. Muesebeck of the U. S. National Museum in Washington for specimens of the recently established braconid wasp which was reported from Hawaii for the first time last year as *Macrocentrus* sp. *M. calacte* was described from Fiji (ANN. MAG. NAT. HIST. XI, 2:317, 1938) from specimens reared from larvae of *Cryptophlebia* sp. This species may eventually be found to attack our recently established *C. ombrodelta* here.

Spathius prusias Nixon: Mr. Beardsley exhibited specimens of this braconid wasp, which were collected on *Leucaena glauca* pods infested with *Araecerus* beetles at Ewa, Oahu, during March, and subsequently reared from *Araecerus* sp. larvae in *Leucaena* pods from this locality. The species determination was made by C. F. W. Muesebeck from comparison with the types in Washington. This is a new insect record for the state. *S. prusias* was described from two specimens: one, the type from Malaya and one paratype from the Philippine Islands (TRANS. ROY. ENT. SOC. LONDON 93:354–355, 1943). A very closely related species, *S. araeceri* Nixon, was bred from *Araecerus fasciculatus* Degeer in Java. The abundance of this braconid at Ewa at the time it was first collected suggests that it may possibly effect some control of *Araecerus* weevils which infest *Leucaena glauca* pods in Hawaii.

Dacus dorsalis attracted to mokihana leaves: Mr. Beardsley observed that for a period of 14 months he had kept in his office a small dried

branch of mokihana (*Pelea anisata* Mann) with about a dozen leaves, collected near Kalalau Lookout, Kapaa, Kauai, November 1960. During the first 8 months, numerous males of the Oriental fruit fly, *Dacus dorsalis* Hendel, were attracted to the dried leaves of this endemic plant, at times as many as 30 or 40 flies being seen on the plant material or resting on the ceiling of the office. The leaves remained attractive to flies to a gradually lessening degree until July 1961, after which time flies were not noted again, and the leaves were finally discarded in January of this year.

Oligotoma (Aposthonia) oceania Ross: Dr. Hardy reported that specimens of this embiid were collected on bracket fungi on the ridge trail above Aiea Heights on March 31, 1962. This is apparently the first time this species has been collected in Hawaii, with the exception of the leeward islands, since E. C. Van Dyke collected two female specimens on Mt. Tantalus, Oahu, January 10, 1923.

Mr. Davis gave the following notes:

Trichopoda pennipes (Fabricius): This tachinid was introduced from Trinidad for the control of the southern green stink bug, *Nezara viridula smaragdula* (F.). From a total of 33 pupae received from Dr. Fred D. Bennett on March 24, 16 adults emerged. The first release of eight sexually mature flies was made at Makaha Valley, Waianae, on April 3, and this was followed by a release of four flies near the Moiliili Quarry on April 5. *T. pennipes* parasitizes the adult stage of the stink bug.

Sepedon macropus Walker: Great numbers of this liver-fluke snail predator as well as many egg rafts were observed at Kawainui Swamp, Kailua, on April 5. The first release of this sciomyzid at this swamp was made on December 27, 1958. *Sepedon praemiosa* Giglio Tos, another predator, was also observed but is not yet considered established because of its recent liberation in this locality.

MAY 14, 1962

The 677th meeing of the Hawaiian Entomological Society was called to order by President Rainwater at 2:10 p.m., Monday, May 14, 1962, at the Experiment Station, HSPA.

Members present: Anderson, Beardsley, Bess, Chong, Fullaway, Gressitt, Habeck, Haramoto, Hardy, Joyce, Look, Madinger, C. Mitchell, Nakata, Quate, Pemberton, Pullen, Rainwater, Shiroma, Steiner, Suehiro, Wilson, Wilton, and Ziegler.

Visitors: Mr. Koji Yano, Mr. Harry B. Clagg, Mr. Charles Yent, and Mr. Alan Terrell.

The Secretary read a letter from Miss Ann Matsumoto thanking the Society for the award presented to her for the best entomological project at the State Science Fair.

Miss Shuch-shiang Huang, Mr. Mervyn Arthur, Mr. Takashi Ishii and Mr. Frank Madinger were elected to membership in the Society.

Dr. Pemberton announced the death of Mr. Joseph Rosa and it was voted that the secretary write a letter to Mrs. Rosa expressing our sympathy and recognizing Mr. Rosa's long years of service to entomology and to the Society. Mr. Rosa, with the entomology department of the HSPA, had been a member of the Society since April 1918, serving as its president in 1937.

Mr. Rainwater discussed a letter from the Hawaiian Botanical Gardens Foundation, asking the Society to become a sponsoring organization in support of their efforts to establish a National Tropical Botanic Garden in Hawaii. It was voted that the Hawaiian Entomological Society give its wholehearted support and become a sponsoring organization.

Through the courtesy of Mr. Alan Terrell, local representative of the American Cyanamid Company, the new motion picture "Modern mosquito control" was shown. This movie presented the very latest methods in the control of mosquitoes.

NOTES AND EXHIBITIONS

Bite of Scolopendra subspinipes Leach: For Mrs. Winifred Mitchell, Dr. Quate reported that on March 22, 1962, she was bitten during the night by the common centipede. The bite was not severe and much milder than a bee sting. The next morning the two holes made by the chelicerae were evident and surrounded by a swollen, reddened area which was hard, tender, and itchy. In a straight line beyond this site were 10 evenly spaced punctures about 0.25 inch apart, probably claw marks from one set of legs. The punctures were less sensitive and tender than the mandible punctures, but itched when touched. For about 48 hours after the bite, the tenderness and irritation of the site increased and then gradually subsided. There were no symptoms of headache, fever, nausea, or general discomfort. After 10 days the hard lump under the bite area was about the size of a pea and eight of the 10 small punctures were still visible. After seven weeks there was still a reddish mark about 0.75 inch in diameter which was painful only when moderate pressure was applied; the small spots had completely disappeared.

Termite queens: Dr. Bess exhibited six large termite queens which had been collected from underground termitaria at Ruiru, Kenya, East Africa, in 1961. Mr. T. L. Crowe, entomologist at the Coffee Research Station, stated that the species was probably *Odontotermes badins*. The specimens varied in size from approximately 2.5 inches in length and three-eighths inch in diameter to 4 inches in length and 0.75 inch in diameter; the combined length of the head and thorax was about three-eighths of an inch. This is a non mound-building species quite abundant in the Kiambu-Ruiru area at altitudes between 5,000 and 6,000 feet.

The following three notes were reported for Mr. Bianchi by J. Beardsley:

Gasteracantha cancriformis (Linnaeus): Mr. Bianchi found this spider established in a pineapple field of Grove Farm Plantation, Kauai, on April 18. This constitutes the first record of the species for the island of Kauai.

Nezara viridula smaragdula (Fabricius): During the last half of April, Mr. Bianchi found this newly established pentatomid feeding on the ripe fruits of strawberry guava and on the tender shoots of a lime tree in his lot, which is located near the shoreline of Diamond Head, a mile or more from the University of Hawaii where the bugs were first found. He pointed out that in both cases the bugs were full-grown adults which had failed to reproduce on the plants mentioned and the nearest eggs and young he could find were on *Malva* plants in the Waialae-Kahala area, much nearer the University.

Parthenothrips dracaenae (Heeger): On May 2, Mr. Bianchi collected numerous specimens of this species which were seriously injuring the leaves of two potted plants of "feathery *Nothopanax*" (*Nothopanax* sp.) in lower Manoa Valley. This appears to be only the third time this heliothripid has been reported in the state.

Aphis craccivora Koch: Mr. Beardsley reported that he had received this determination from Miss Louise M. Russell, U.S.D.A., in Washington, for specimens of aphids from pigeon peas collected at Waipio, Oahu, during March. According to Miss Russell, this species has long been misidentified in the United States as *Aphis medicaginis* Koch, and, in all probability, Hawaiian records of *A. medicaginis* should be referred to *A. craccivora.*

Pachycrepoideus dubius Ashmead: Mr. Beardsley exhibited puparia of *Gitonides perspicax* (Knab), a predaceous drosophilid fly and an important enemy of many mealybug species, which had been parasitized by a pteromalid wasp, *Pachycrepoideus dubius* Ashmead. This parasite has been reared locally from various species of *Drosophila*, but this is the first known record of its attacking the beneficial *G. perspicax* here.

Canthon humectus (Say): Miss Chong noted that this dung beetle was recovered for the first time on the island of Maui on April 12, when one adult was collected in cowdung at Waiakoa by Nobuo Miyahira, resident entomologist. This scarabaeid beetle was introduced from Mexico in 1923 by H. T. Osborn and the first recovery of it was made at Waikii, Hawaii, by Dr. Swezey and Mr. Look in 1947.

Aerosol spraying of aircraft: Mr. Rainwater reported that the Honolulu office of the Plant Quarantine Division has been authorized to discontinue routine agricultural aerosol spraying of aircraft arriving from foreign areas for a 90-day test period beginning May 2, 1962. Information

compiled to date on types and quantities of insect hitchhikers intercepted on aircraft, indicates that adequate control of serious agricultural pests on aircraft is possible by intensifying the inspection of aircraft and treating only when live insects are found. During the 90-day test period, all arriving foreign aircraft will be closely inspected and treated only if live insects of agricultural interest are found. A careful record will be kept of insects and if the evaluation of this data does not indicate otherwise, this procedure will become permanent.

Prior to May 2, Honolulu was the only international entry port in the United States that routinely sprayed arriving aircraft as agricultural interests in Hawaii believed the year-round semitropical climate made Hawaii more susceptible to the introduction of dangerous agricultural insect pests.

Routine aerosoling is discontinued for the following reasons: 1, records show that few live agricultural insect pests actually hitchhike on aircraft; 2, aerosol application is ineffective in loaded cargo compartments of transiting jet aircraft; 3, World Health Organization recommendations for "clean, pest free" airport areas around all international airports have resulted in reducing insect pests; 4, the short ground time of jet aircraft prevents pests getting aboard; 5, arriving aircraft will be immediately treated if live agricultural insects are found; 6, information of insect pest buildup in vicinity of foreign airports will be maintained and when justified, routine treatment of aircraft will be resumed for duration of high insect population level; 7, Japanese beetle trapping operation will continue around Honolulu airports during summer periods.

Campbell Island insects: Dr. Gressitt exhibited sub-Antarctic wingless and short-winged insects collected in November and December 1961, on Campbell Island.

Bdella distincta Baker and Balock: It was reported for Mr. Chilson that this mite [PROC. ENT. SOC. OF WASHINGTON 46 (7) :179–180, 1944] represents an addition to Hawaii's known mite fauna. It was collected at Houston, Texas, on pine cones from Hawaii in 1934 and on bamboo from China in 1941.

JUNE 13, 1962

The 678th meeting of the Hawaiian Entomological Society was called to order by President Rainwater at 2:07 p.m. on Wednesday, June 13, 1962, at the Experiment Station, HSPA.

Members present: Bess, Chong, Fullaway, Habeck, Hamilton, Hardy, Huang, Joyce, Kajiwara, Kawanishi, Look, Matsumoto, C. Mitchell, Nakata, Nishida, Pemberton, Rainwater, Shiroma, Suehiro, Sugerman, Thistle, Wilson, Wilton, Yano, and Yoshimoto.

Visitors: Mrs. Hope D. Watson, Mr. William R. Smythe, Mr. G. A. Samuelson, Mr. H. R. Fallers, Jr., Dr. Albert R. Mead, Dr. James C. Gilbert.

Mr. Celso Garcia Martell, Mr. Harry Clagg, and Mr. Koji Yano were elected unanimously to membership in the Society.

Dr. Albert R. Mead, chairman, Department of Zoology, University of Arizona, discussed aspects of his current Hawaiian studies on the giant African snail, dealing especially with the predators and diseases of this pest.

NOTES AND EXHIBITIONS

The following notes were reported by Miss Chong for Stephen Au:

Catabena esula Druce: Pupal cases of this lantana defoliator were found on the southwest side of Lanai. It also was found established on Kauai at Puu Opae, the first record for that island.

Cinara sp.: This twig aphid was collected at Kaiholena, Lanai, at an altitude of 1700 ft., on what was tentatively identified as loblolly pine. The infestation was not as heavy as that reported on Molokai. There was no indication of dieback or yellowing and ants were associated with the plant lice.

Araecerus levipennis Jordan: This koa-seed weevil was collected on *Leucaena glauca* (L.) on Lanai where it is widely established although the infestation at the time was light.

Rhinacloa forticornis Reuter: Dr. Joyce exhibited specimens of this immigrant mirid bug and reported that it recently made its appearance in Hawaii, appearing well established. The first record consisted of two specimens taken in a light trap on the Public Health Service Quarantine Station, Honolulu, on April 30. Since that time 54 more specimens have been taken in this light trap. During the last four weeks the catch has averaged about 10 specimens a week. On May 28 three specimens were noted in a trap operated on Sand Island, two were taken in the trap at the Honolulu International Airport, and one was taken by sweeping grass and weeds on the Quarantine Station. The species is known to occur in southwestern United States and has been taken on two occasions in spot checks of aircraft from California.

Aldrichina grahami (Aldrich): Dr. Joyce reported that two specimens of this new immigrant calliphorid fly were taken in a mosquito light trap operated at the U. S. Coast Guard Station on Sand Island, Oahu, on May 26. It is a large blowfly characterized by the absence of the hindmost presutural intraalar bristle and the distinctly pollinose abdomen. The species occurs in India, Siberia, China, and Japan, and has been introduced into the United States where it has now spread to six western states. It is readily attracted to fish and meat baits. Specimens of this species have been taken from surface vessels in Honolulu Harbor in recent years. (Hall, D.G., 1948, BLOWFLIES OF NORTH AMERICA, THOMAS SAY FOUND. 4:290.)

Culex tritaeniorhynchus Giles on Guam: Dr. Joyce reported that a

mosquito survey he made on Guam, during the week of May 20 to 27 showed that this species was very abundant, and many larvae and adults were taken. From its abundance it appears that the species has been there for some time; but may have gone unrecognized since the adults are very similar to *Culex annulirostris marianae* Bohart and Ingram. The adults are identified by the mid femur which is dark scaled anteriorly, the coppery scutal scales, and the pale abdominal bands which are narrower than in *litoralis*. The larvae are distinguished by the long, slender siphon with a preapical hair tuft laterally out of line [Bohart, R. M., 1957, B. P. Bishop Mus., Ins. Micronesia, Bull. 12 (1)]. In the catalog of the mosquitoes of the world, Stone, Knight, and Starcke list the Pacific form as subspecies *summorosus* Dyar.

C. tritaeniorhynchus is the most important vector of Japanese "B" encephalitis in Japan and other parts of the Orient. The species is common in the Philippines, Okinawa, Japan, and generally throughout the Orient and southeast Asia.

Methyl bromide for avocados: Mr. Rainwater announced that methyl bromide treatment has been approved for avocados. The fumigant is to be applied at the rate of 2 pounds per 1,000 cubic feet for 4 hours at 70° F. or above. Certain varieties are susceptible to some fumigation injury such as pitting or skin scald; no injuries have been observed in the varieties Kashlan, Kahaluu, and Lehua.

Scadra rufidens Stål: Dr. Hardy reported that 10 specimens of this reduviid were collected by the beginning entomology class, and the species is apparently common now all over Oahu.

Mr. Shiroma gave the following notes:

Christmas Island insects: On a recent survey of Christmas Island by D. C. Hamilton, Plant Quarantine Division, 22 species of insects were collected, 14 of which were previously unrecorded. Thirteen of these have been identified by specialists of the U.S. National Museum; two are still being studied.

Trigonotylus dohertyi (Distant) (Heteroptera: Miridae), on *Lepturus repens*, 2 adults, 1 nymph; det. R. C. Froeschner.

Aspidiotus lataniae (Signoret) (Homoptera: Diaspididae), on *Scaevola frutescens;* local determination.

Pinnaspis strachani (Cooley) (Homoptera: Diaspididae), on leaves of coconut and stems of *Messerschmidia argentea*, heavy infestation; local determination.

Chelisoches sp., probably *morio* (Fabricius) (Dermaptera: Chelisochidae), in calyx of coconut, 3 nymphs; det. R. W. Hodges.

Coelophora inaequalis (Fabricius) (Coleoptera: Coccinellidae), on *Pluchea* sp., 5 adults; det. P. J. Spangler.

Curinus coeruleus (Mulsant) (Coleoptera: Coccinellidae), on *Scaevola* sp., 2 adults; det. P. J. Spangler.

Diocalandra sp. probably *taitensis* (Guerin) (Coleoptera: Curculionidae), on young coconut fruits, 5 larvae, 1 pupa; det. D. M. Anderson.

Genus near *Labdia* (Lepidoptera: Cosmopterygidae), on *Messerschmidia argentea*, 5 adults; det. R. W. Hodges.

Ereunetis flavistriata Walsingham (Lepidoptera: Tineidae), in calyx end of coconut; det. D. M. Weisman. These larvae are found in abundance on young coconut fruits in Hawaii.

Phaenicia sericata (Meigen) (Diptera: Calliphoridae), on *Messerschmidia argentea*, 3 adults; det. C. W. Sabrosky.

Neoscatella sp. (Diptera: Ephydridae), over fresh-water pond, 3 adults; det. W. W. Wirth.

Sarcophaga misera Walker (Diptera: Sarcophagidae), on *Pluchea* sp., 2 adults; det. C. W. Sabrosky.

Camponotus sp. (Hymenoptera: Formicidae), on BOQ floor, 3 workers; det. M. R. Smith.

Nezara viridula smaragdula (Fabricius): Inspectors of the Plant Quarantine Division have brought in various stages of this insect from these localities and hosts: Ewa Beach on hibiscus; Hickam Air Force Base on unidentified shrubbage; Damon Tract on *Passiflora* sp.; upper Manoa Valley on orchids and unidentified weeds; lower Palolo Valley and Kapahulu on castor bean, hibiscus, lemon, and pomegranate; Aina Haina, on hibiscus. Specimens were also intercepted in baggage, on cut flowers and *Vanda* sp. destined for California.

JULY 9, 1962

The 679th meeting of the Hawaiian Entomological Society was called to order by President Rainwater at 2:08 p.m., on Monday, July 9, 1962, at the Experiment Station, HSPA.

Members present: Beardsley, Bianchi, Bryan, Chock, Chong, H. Clagg, Fullaway, Habeck, Hardy, Huang, Joyce, Kim, Look, C. Mitchell, Nakata, Rainwater, Suehiro, Wilton, Yano, and Yoshimoto.

Mr. G. A. Samuelson was unanimously elected to membership in the Society.

Mr. Beardsley presented a most interesting illustrated talk on the fauna and flora of the Leeward Islands: Nihoa, Necker, Laysan, and French Frigate Shoals.

NOTES AND EXHIBITIONS

Archlagocheirus funestus (Thomson): For Mr. Krauss, Miss Chong reported that this is the correct name for *Lagocheirus funestus* Thomson, the Central American beetle borer introduced into Hawaii in 1950 for the control of cactus. [See Dillon, S., 1957, BRIT. MUS. (NAT. HIST.) ENT. BULL. 6 (6) :164–165.]

Protalebrella brasiliensis (Baker): Mr. Kim reported that in the Makiki area this cicadellid was causing heavy damage to *Lippia canescens*, a low-

growing plant commonly used as ground cover. Dr. Joyce first reported this insect in September 1960 when one specimen was caught in a light trap. More specimens were obtained in July 1961 by sweeping vegetation in the area around his office. This is the first report of it damaging plant material.

Mansonia (Mansonioides) uniformis (Theobald): Dr. Joyce reported that one female of this species was discovered in the mosquito light trap catches from Guam dated May 24, 1962. Though the species is widely distributed throughout the Orient from Japan to Australia, this is the first apparent record from Micronesia. *M. uniformis* is a vector of the filaria, *Brugia malayi* (Brug) , in Borneo and other portions of the Dutch East Indies. The larvae breed in thickly overgrown swamps and pools, attaching themselves to the underwater parts of the plants. The adults are persistent biters and are distinguished by the presence of postspiracular bristles, broad, mixed white and dark scales, and white-ringed tarsi; the first hind tarsal segment with a median pale band. (Bohart and Ingram, 1946, Mosquitoes of Okinawa. NAV. MED. BULL. WASH., 1955.)

Rhinacloa forticornis Reuter: Dr. Joyce received the following additional information from Dr. R. C. Froeschner of the U. S. National Museum: This species occurs from New Jersey to California and southward through Central America and the West Indies to Brazil and Peru. This mirid is a general feeder and has been reported from desert willow, *Cowania, Acacia,* corn, peppers, peach, cotton, black-eyed peas, tomatoes, mustard greens, lettuce, squash, and sugar beets.

Nezara viridula smaragdula (Fabricius): Dr. Habeck found nymphal stages of the southern green stink bug on lima beans at Waimanalo on June 26, indicating that it is now on the windward side of Oahu.

AUGUST 13, 1962

The 680th meeting of the Hawaiian Entomological Society was called to order by President Rainwater at 2:11 p.m., on Monday, August 13, 1962, at the Experiment Station, HSPA.

Members present: Beardsley, Bess, Bianchi, Chong, C. Clagg, H. Clagg, Davis, Fullaway, Gressitt, Habeck, Hardy, Hamilton, Kim, Look, C. Mitchell, Nakata, Pemberton, Rainwater, Ross, Sasakawa, Steiner, Suehiro, Thistle, Woolford, Yano, and Yoshimoto.

Visitor: Mr. Dennis Wataoka.

Dr. M. Sasakawa was elected to membership in the Society.

Mr. Steiner discussed the recent campaign to eradicate the Mediterranean fruit fly from Florida. Dr. Gressitt gave a very interesting illustrated talk about his recent trip to New Guinea.

NOTES AND EXHIBITIONS

Hippelates collusor (Townsend): Dr. Hardy reported that one speci-

men of the Coachella Valley and Lower California eye gnat was present in a collection made by George Butler on Kure Island the summer of 1961. This species is not known to be established in Hawaii.

Phycitid larvae damaging silversword flowers: Mr. Beardsley exhibited larvae of a phycitid moth, probably *Rhyncephestia rhabdotis* Hampson, feeding in flower heads of silversword, *Argyroxiphium sandwicense* D. C., which were collected in Haleakala Crater, Maui, on August 9, by Mr. Beardsley. Of several flowering silversword plants examined, nearly 100 percent of the flower heads were damaged by caterpillars and an estimated 80 to 100 percent of the seeds in damaged heads had been destroyed. *R. rhabdotis* is an endemic moth known only from Haleakala, and its only known host is the silversword. Similar damage has been reported several times in the past [Swezey, 1932, "PROCEEDINGS" 8 (1) :198–199].

Bishop Museum Entomology Department: Dr. Gressitt reported that two entomological expeditions are in progress. The first is to North Borneo, the second to Netherlands New Guinea. The New Guinea expedition started at the end of June and is now operating in the far west highlands near the neck of Vogelkop, after earlier work in the Cyclops Mountains, Biak and Nabire at the southern end of Geelvink Bay. Later, a party will return to northeast New Guinea and then go to New Britain. Other work will be carried on in the Kermadec Islands and Antarctica.

Sphenophorus venatus vestita (Chittenden): Mr. Bianchi reported that on July 23, J. W. Beardsley and he examined a 4.5-acre area at the substation in Kailua, Oahu, where HSPA geneticists had reported sugar cane seedlings were being destroyed by this curculionid. Seedlings, germinated in greenhouses at Makiki, Honolulu, had been transplanted at Kailua in bundles of 20 to 30 seedlings evenly spaced in long rows and ranging in height from 6 or 7 inches to a foot or two. About one-fourth of the bundles showed sign of beetle activity; in many, all the seedlings had been killed. The period of greatest activity seemed to have passed, however, for neither beetles nor larvae were found in abundance.

Eggs were usually laid singly on individual seedlings a short distance above ground, and early development occurred as the young larvae bored into and fed within the spindles. Later, the larvae, emerging from underground seedlings, finished their growth feeding on the massed roots and bases of the other seedlings in the bunch. A single larva often accounted for all the seedlings in one bunch; but in some cases individual seedlings were able to overcome basal damage by throwing out roots above the injury and continuing to grow.

S. venatus vestita seriously damages *Zoyzia* lawns in Honolulu and is known from a number of other graminaceous hosts in the southeastern states [Vaurie, BULL. AM. MUS. NAT. HIST. 98 (2) :114–124, 1951], but this is the first record of damage to sugar cane.

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

Solenopetes capillates Enderlein: On July 24, Mr. Au sent specimens of lice removed from the head of a young calf collected at Kipu Ranch, Kauai, by Mr. H. Goodale. These were identified by Dr. Joyce and represent a new pest record for Kauai and the state.

Sphenophorus venatus vestita (Chittenden): Mr. Au reported the discovery of this species at Lawai, Kauai, the first record of this grass pest for the island.

Cinara carolina Tissot: Within the past month, large populations of the forest insect pest, *C. carolina*, recently identified by Dr. G. A. Bradley, were reported at the experimental loblolly (*Pinus taeda*) plot at Olinda, Maui. These aphids were previously observed on slash pine, *P. elliottii*, and reported from pinaster (*P. pinaster*) and Monterey pine (*P. radiata*) within the past two years. They were also observed and collected on Molokai and Lanai.

Observations at Olinda, Maui, on July 18, indicated that aphid populations on loblolly seedlings in the experimental plot appeared to be subsiding but were moderately abundant on some plants. Alate aphids were readily observed and, in the absence of natural enemies, may trigger new population increases. Although unusually high populations were observed a month ago, damage to the seedlings was negligible, and this was probably a result of excellent plant vigor. Most of the infestation was on terminal shoots. *C. carolina* was very sporadic on *P. pinaster* saplings and alate forms were scarce. On *P. elliottii* saplings, light to moderate aphid populations were observed on the middle of the branches and some needles were chlorotic. Alate aphids were infrequent.

On Molokai, *C. carolina* occurred in small numbers at the mountain forest nursery on *P. elliottii*, *P. taeda*, and *P. canariensis*, and at Makakupaia on *P. pinea*.

Heliothrips haemorrhoidalis (Bouché): The most important insect damage to pine plantings was on Monterey pine, *P. radiata*, and was caused by this thrips. Several pines in the Makakupaia region showed much killing of needle clusters. Thrips were readily jarred from infested branches and two terminal branches yielded 45 and 55 thrips, respectively. It is believed that the peak of infestation occurred about two weeks ago and that with recent showers, damage may subside. Thrip damage was not seen on other species of pine on Molokai; dead needles, evident on lower branches and bole of *P. pinea* and other species, do not appear to be a result of insect damage.

Spodoptera mauritia acronyctoides (Guenée): Mr. C. Clagg, Naval District Public Works Officer, described a recent outbreak of the lawn armyworm which caused serious damage to 33 acres of lawns surrounding Marine Corps units at the Manana Housing Area. Mr. Clagg was asked for advice and his investigation established the following chain of events leading to the outbreak. The Marine Maintenance Office at Camp H. M.

Smith, which is responsible for the maintenance of their units, gave a contract to fertilize the lawns to the low bidder without advice from the entomologists; the treatments were applied June 14 to 21, 1962. The contractor added insecticides to demonstrate the value of his work.

The grass grew nicely until August 2 when many complaints were received of worms crawling on lanais and sidewalks. Inspection on August 3 revealed that thousands of young worms were almost completely denuding the lawns and even the weeds were attacked by hungry larvae. Units under Navy maintenance on the upper slopes of this housing area revealed a dramatic absence of *Spodoptera*; a distance of only 50 feet, or one house lot, separated the heavy infestation on the sprayed, well-fertilized lawns from the uninfested lawns which had not been sprayed in June. Many tachinid flies identified as *Eucelatoria armigera* were visible on the infested lawns.

As the tachinid parasites were obviously regaining control, the tenants were advised to continue to water and fertilize as needed. The contractor admitted that the insecticide application must have reduced the parasites over the 33 acres so that the *Spodoptera* were able to multiply for one or two generations, and that he had bid low on this first job, claiming not to have encountered this type of serious outbreak before.

SEPTEMBER 10, 1962

The 681st meeting of the Hawaiian Entomological Society was called to order at 2:05 p.m. on Monday, September 10, 1962, at the Experiment Station, HSPA, President Rainwater presiding.

Members present: Abramovitz, Beardsley, Chong, Davis, Fullaway, Habeck, Joyce, Kamasaki, Look, C. Mitchell, Nakao, Nakata, Pemberton, Rainwater, Sasakawa, Shiroma, Sugerman, Tanada, Thistle, Woolford, Yano, and Yoshimoto.

Visitor: Mr. Robert J. McKeand.

It was announced that the 1962 issue of the Proceedings had been distributed. The financial plight of the Society, due to the high cost of printing the Proceedings this year, was discussed. President Rainwater appointed the following members to constitute a committee to seek aid from one of the foundations: C. E. Pemberton, Chairman, Alan Thistle, and Henry Bess. President Rainwater announced that Amy Suehiro has agreed to edit the Proceedings for 1963.

Mr. C. J. Davis gave an illustrated talk on the current work of his department. He discussed the status of the biological control projects for the control of weed pests, insect pests, and snails and covered the exploratory projects under way.

NOTES AND EXHIBITIONS

Mr. Beardsley presented the following notes:

Orthodera sp.?: A small praying mantis, tentatively identified as an

Orthodera, was taken in a light trap at Waipio, Oahu, on September 8. The specimen does not appear to be *O. ministralis* (Fabricius), which is known to occur only on Kauai, as the pronotum is considerably narrower than in the two Hawaiian specimens of *O. ministralis* available for comparison. The inner surface of the front leg of the specimen is strikingly marked: the coxa is reddish orange, and the femur has a prominent blue spot.

Eriosoma lanigera (Hausmann): On August 9, several bushes of the native shrub *Osteomeles anthyllidifolia* Lindley (Rosaceae), were found heavily infested with the wooly apple aphid, at an altitude of about 6,500 ft. in Haleakala Crater, Maui. This apparently is a new host record for the aphid which has been reported previously in the state on apples on Hawaii and Maui.

Opius sp., near **aridis** Gahan*: This determination was received recently from Dr. C. F. W. Muesebeck of the National Museum for specimens of a small *Opius* wasp reared by Drs. Habeck and Tamashiro of the University of Hawaii from an agromyzid leafminer, *Liriomyza minutiseta* Frick, from lima bean leaves collected at Waimanalo, Oahu, during July. The only other *Opius* known to develop on agromyzids here is *O. lantanae* Bridwell, which parasitizes the lantana agromyzid, *Ophiomyia lantanae* (Froggatt). The present species differs from *O. lantanae* in having a shorter ovipositor, different sculpture, and other characteristics. This is a new insect record for the state.

Mr. Shiroma gave the following report:

Eumerus marginatus Grimshaw: On August 14, a shipment of four crates of ginger from Honolulu for San Francisco was found to be infested with larvae of this species. Eight larvae were collected and primary feeding was apparent on the ginger. Up to now this larva was thought to be a scavenger, being found associated with rotted tissues ["PROCEEDINGS" 17 (1) :7, 1959]. The larvae were identified by Dr. Hardy.

Aspidiella hartii and **Lepidoptera larvae:** Recently for the first time in Honolulu, plant quarantine inspectors have been finding ginger roots infested with a ground scale [*Aspidiella hartii* (Cockerell)], a species of pyraustid larva, and a species of noctuid larva in cargo shipments from Suva, Fiji. The larvae seem to be damaging the outer surface of the ginger and until they can be specifically identified, treatment will be required as a condition of entry, whenever they are found.

OCTOBER 8, 1962

The 682nd meeting of the Hawaiian Entomological Society was called to order at 2:08 p.m., on Monday, October 8, 1962, at the Experiment Station, HSPA with President-elect C. J. Davis presiding.

*Described as *Opius dissitus* Muesebeck (see p. 289).

Members present: Anderson, Bess, Chong, Davis, Fullaway, Gressitt, Habeck, Hardy, Joyce, Look, W. Mitchell, Nakata, Pemberton, Sasakawa, Shiroma, Suehiro, Woolford, Yano, and Yoshimoto.

Visitors: Dr. Marie Hammer, Miss Dely Pascual, Dr. Charles Rutschky, and Dr. R. W. Strandtmann.

Mr. Martin Fujimoto and Mr. Robert McKeand were elected to membership in the Society.

Dr. Marie Hammer and Dr. R. W. Strandtmann, visiting acarologists at the Bishop Museum, gave very interesting talks covering some aspects of their work on mites.

NOTES AND EXHIBITIONS

Nezara viridula var. **smaragdula** (Fabricius) **egg parasites**: Mabel Chong reported that the State Department of Agriculture, on September 22, 1962, imported two species of egg parasites for the control of the southern green stink bug. These encyrtids, *Ooencyrtus submetallicus* How. and *O. trinidadensis* Crawf. from F. D. Bennett, Trinidad, W. I., were released in Nuuanu and at Waimano Home, Oahu.

Rhinacloa forticornis Reuter: Miss Chong also reported that this mirid, previously captured only in light traps or by sweeping, was reared in large numbers from kiawe blossoms (*Prosopis chilensis*) collected at Red Hill, Honolulu, in May. Identification was made by Dr. Froeschner.

Macadamia nut damage: Dr. W. Mitchell exhibited some damaged macadamia nuts collected in Nuuanu Valley on October 8. The kernels had dark sunken areas that formed spots, making them unattractive for food processing and future sale. The sunken areas are believed to be collapsed cells and damaged tissue at presumed feeding sites of *Nezara viridula* var. *smaragdula* (F.), the southern green stink bug.

Atrichopogon jacobsoni (De Meijere): For Mr. Beardsley, Dr. Hardy reported that this ceratopogonid midge was found in large numbers on undersides of corn leaves at Hilo, Hawaii, in September by Mr. Beardsley. This is a new island record for this species.

Sphenophorus venatus vestita (Chittenden): Dr. Habeck noted that the hunting bill bug is now established on Molokai, a new island record. Specimens were sent by Mr. J. Blalock who reported that the beetles were damaging the turf of the athletic field at Kaunakakai, Molokai, in September.

NOVEMBER 14, 1962

The 683rd meeting of the Hawaiian Entomological Society was called to order by President-elect Davis at 2:05 p.m., on Wednesday, November 14, 1962, at the Experiment Station, HSPA.

Members present: Anderson, Arthur, Beardsley, Chock, Davis, Fullaway, Gressitt, Habeck, Haramoto, Huang, Ishii, Ito, Kajiwara, Kawani-

shi, Krauss, Look, Matsumoto, W. Mitchell, Nakao, Nakata, Nishida, Pemberton, Ross, Rutschky, Sanchez, Sherman, Steiner, Strandtmann, Suehiro, Tamashiro, Woolford, Yano, and Yoshimoto.

Visitors: Mr. Joel Rodriguez-Velez, Mr. Romeo Dizon, and Mr. Francisco Laigo.

Dr. Charles Rutschky and Dr. R. W. Strandtmann were elected to membership in the Society.

Dr. Pemberton reported that the McInerny Foundation has given the Society a grant of $500 to be applied to cost of publishing the 1962 Proceedings.

Mr. Noel Krauss presented an interesting talk on his recent collecting trip to the Azores, Madeira, Canaries, Portugal, and Mexico.

NOTES AND EXHIBITIONS

Conoderus sp.: Mr. Beardsley exhibited specimens of a small elaterid beetle, new to Hawaii, which were taken in HSPA light traps at Ewa and Waipio, Oahu, during October and November. Mr. R. H. Van Zwaluwenburg has identified the beetle as a species of *Conoderus*, apparently not a North American form. He hopes to be able to provide a specific identification sometime in the near future.

Melanagromyza virens (Loew)? damaging safflower: Mr. Beardsley reported that a number of badly damaged plants from an experimental planting of safflower (*Carthamus tinctorius* L.) at Kohala Sugar Co. on Hawaii were received by the HSPA Entomology Department during October. Most of the plants were dead or dying because of work of a stem miner. A number of adults of *Melanagromyza* issued from these plants during the week following their receipt, and the larvae and puparia were found within the affected stems. *M. virens* has been reported doing serious damage to experimental plantings of safflower in California (Mueller and Lange, CALIF. AGRIC., March 1959).

Sepedon macropus Walker: Dr. W. Mitchell reported that while sweeping pickle weed, *Batis maritima* (L.) in the old Hawaiian salt beds of Kahua Ranch, Ewa Oahu, one specimen of *Sepedon macropus* Walker was captured. It is the first recovery of an adult in this area which is four miles from the nearest release site. *S. macropus* is an introduced parasite of the aquatic *Lymnaea* snails.

Solenopsis geminata (Fabricius): Damage to pole beans by this ant was observed by Dr. Mitchell in Makaha Valley, Oahu, on October 16. The area was dry and vegetation appeared to need water. The damage was characterized by discolored spots on the bean pods where the surface was scarified and eaten away. The feeding site tissues later dried, collapsed, and part of the pod dropped off. A number of ants were observed feeding in a circle, heads toward the center (similar to cattle feeding at a trough), chewing away the epidermis. In several places they chewed through the

shell, entered the pod and fed on the beans. Some of the ants had nested in the pods.

Bishop Museum news: Recent visitors to the museum were Dr. and Mrs. A. E. Emerson, recently retired from the University of Chicago, on their way to New Guinea and Borneo for six months of field work. Another visitor was Mr. Ronald Paine, long associated with biological control of Fiji insects, who is going to work on biological control of *Graeffia* stick insects for the Fiji government.

Plans for the new entomology building were displayed by Dr. Gressitt, and a new expedition to New Caledonia by the Entomology Department was announced.

The following notes were presented by N. L. H. Krauss:

Melanagromyza virens (Loew): Larvae of this agromyzid fly were found heavily infesting the stem and branches of a large cocklebur (*Xanthium* sp.) at Parker Ranch, Hawaii on October 31. Several pteromalid parasites, *Habrocytus* sp., were bred from the *Melanagromyza*; this is a new island record for the pteromalid. The agromyzid was identified by Dr. Hardy and the pteromalid by Mr. Beardsley.

Prosopis pallida (Willd.) HBK: The kiawe or mesquite known in Hawaii as *P. chilensis* (Molina) Stuntz and earlier as *P. juliflora* (Sw.) DC. is now considered to be *P. pallida*, according to Marshall C. Johnston, [1962, BRITTONIA, 14 (1) :88]. *P. pallida* is native to arid areas in Colombia, Ecuador, and Peru.

Apion antiquum Gyllenhal: This South African weevil was bred from stems of the polygonaceous weed *Emex australis* Steinh. collected at Parker Ranch, Hawaii, on October 31. One specimen of *Eupelmus cushmani* (Crawford) and several wingless eupelmids, *Charitopodinus swezeyi* (Crawford), were bred from the stems. *E. cushmani* is a parasite of various Coleoptera in Hawaii and the *Charitopodinus* is a hyperparasite. The parasites were identified by J. W. Beardsley. According to a letter dated 10th May, 1956, from the Director of the Royal Botanic Gardens, Kew, England, *Emex australis* is native to South Africa and was carried to western Australia in 1830. It is a troublesome weed in many parts of Australia, as in Hawaii. The Mediterranean *E. spinosa* (L.) Campd. is also a pest in Hawaii.

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

Uroplata girardi Pic: The Brazilian lantana leaf-mining hispid, *Uroplata girardi*, appears to be well on its way to successful establishment in east Lawai Valley, Kauai.

On October 24, dozens of infested lantana leaves and one adult beetle were observed in the vicinity of the release point. All stages of development were noted and it was estimated that the area of infestation covered approximately 4000 square feet. The annual rainfall at east Lawai Valley is 67 inches and it appears that we now have a potent blotch leaf miner

as well as a destructive stem and root borer for the wetter lantana areas of the state.

Microlarinus lareynii Duval: This introduced puncture-vine weevil was found in all stages of development at the release point of a 25-acre infestation of the noxious puncture vine weed pest, *Tribulus terrestris*, at Mana, Kauai last month. A second crop of seed was developing and thousands of seedlings which had been "triggered" by recent rains were observed. This is an extremely favorable situation for the establishment of this weevil and the spread of *M. lareynii* throughout much of the 25-acre infestation within the next six months is anticipated.

Spodoptera mauritia acronyctoides (Guenée): A heavy infestation of the lawn grass armyworm, at Oili Loop, Waialae Nui was noted recently by James Kim. Large populations of young to mature larvae were found feeding on Tifton 358, a relatively new lawn grass. Only a few tachinid parasites were observed.

Xenoencyrtus niger Riek: A new egg parasite, native to Australia, was released recently at Waianae for biological control of *Nezara viridula* var. *smaragdula* (Fabricius). The parasites were received through the cooperation of Dr. Douglas Waterhouse, Chief, Division of Entomology, Canberra, Australia.

DECEMBER 10, 1962

The 684th meeting of the Hawaiian Entomological Society was called to order by President Rainwater at 2:00 p.m. on Monday, December 10, 1962 at the Experiment Station, HSPA.

Members present: Anderson, Beardsley, Bianchi, Chong, Davis, Fullaway, Habeck, Hamilton, Haramoto, Huang, Joyce, Kajiwara, Kawanishi, Kim, Krauss, Look, Matsumoto, McKeand, W. Mitchell, Nakata, Nishida, Rainwater, Rodriguez-Velez, Ross, Rutschky, Sakimura, Sanchez, Shiroma, Steiner, Strandtmann, Suehiro, Tamashiro, Woolford, and Yano.

Visitors: Mrs. H. I. Rainwater and Mr. John Harrell.

Mr. Joel Rodriguez-Velez, Mr. Romeo Dizon, and Mr. Francisco Laigo were elected to membership in the Society.

The following officers were elected for the year 1963:

President	C. J. Davis
President-elect	Martin Sherman
Secretary	E. S. Shiroma
Treasurer	Minoru Tamashiro
Advisor	D. E. Hardy

Dr. Walter Carter, entomologist with the Pineapple Research Institute was elected an Honorary Member of the Society. Dr. Carter, who retired November 1, 1962, has been a member of this society since May 1930.

Mr. Fullaway announced the death of Dr. Joseph Rock on December 5, in Honolulu. Dr. Rock was one of the early botanists of Hawaii, first

coming to the islands in 1907. He described numerous endemic Hawaiian plants from his extensive collection, and published numerous important and authoritative works on the Hawaiian flora, among them the well-known "Indigenous trees of the Hawaiian Islands."

The members voted to send fifty dollars to the Zoological Society of London as the Society's contribution toward publication of The Zoological Record.

President Rainwater turned the meeting over to President-elect Davis and, as his presidential address, gave a very interesting account of various aspects of quarantine work in Hawaii.

NOTES AND EXHIBITIONS

Oryctes rhinoceros (L.) **in Samoa:** Mr. Steiner reported that the coconut rhinoceros beetle has damaged 80 percent of the coconut palms on the main island of Tutuila, American Samoa. Examinations of 3000 palms at 25 general locations in August, 1962, indicated that the infestations were surprisingly uniform although all trees in some local areas showed severe injury.

The following three notes were presented by Mr. Krauss:

Brochymena quadripustulata (Fabricius): A specimen of this pentatomid bug, the arboreal stink bug, was collected by Masao Kaneshiro, on empty fertilizer bags at his farm on Puhawai Road, Lualualei Valley, Oahu, about October 1962. He sent the specimen to the Entomological Branch, State Department of Agriculture, and stated that he had first seen this species at his place about a year ago. Specimens were sent to Dr. Herbert Ruckes of the American Museum of Natural History for identification. This bug is widely distributed across southern Canada, the United States from the Atlantic to the Pacific coasts and in northern Mexico. It feeds on *Pinus, Sorbus, Quercus, Salix, Ulmus,* grape, cherry, apple, and pear and is also predacious on soft-bodied insect larvae. The adults hibernate under bark or in rubbish. The species is discussed by Dr. Ruckes [ENT. AMERICANA, 26 (4) :185–189, 1946].

Ceroplastes cirripediformis Comstock: A heavy infestation in December of this barnacle scale on branches of zitherwood (*Citharexylum* sp.) a tree growing along Beretania Street, near the corner of Punchbowl Street, was called to our attention by Walter Holt, State Forester. This is a new host record. The scale was identified by J. W. Beardsley.

Aceria swezeyi (Keifer): The galls formed by this eriophyid mite were very conspicuous on the branches of lama (*Diospyros ferrea* var. *pubescens* form *sclerophylla* Fosberg) at Puuwaawaa Ranch, North Kona, Hawaii on October 28, 1962. This mite was described in 1940 from Oahu by H. H. Keifer, and the present identification was made by him.

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

Rare noctuid on Kauai: A colorful noctuid was received from Mr.

Stephen Au last September who reported that it had been caught at light at the Kokee Tracking Station, Kauai, on September 10th, by T. Correa. After checking local reference collections, the specimen was sent to Dr. Todd, Washington, who commented as follows: "The very unusual noctuid recently collected at Kokee, Kauai by Mr. Correa is apparently an undescribed species. Furthermore, I cannot at this time state whether it can be assigned to an established genus or whether a new generic name as well must be proposed. This will require considerable study and examination of the genitalia of this specimen and types of many other genera."

Another specimen of this noctuid, collected by Mr. Au's son at Kokee in 1957 was exhibited at this meeting.

Hunting bill bug on Maui: Harry Nakao and Nobuo Miyahira reported that the hunting bill bug, *Sphenophorus venatus vestita* (Chittenden), is established at Kaanapali, Maui. This is the first record of this pest on this island and the fourth island that it has spread to since its discovery at Hickam Field, Oahu, in 1960.

Cryptophlebia sp. on Hawaii: For Mr. Ernest Yoshioka, Mr. Davis reported that this eucosmid was very active in terminal shoots of rainbow shower trees in Hilo. It was also reported active on Kauai by Mr. Au and these constitute new island records for this pest.

New Immigrant Records for the Year 1962

Species marked with an asterisk were reported from the Hawaiian Islands for the first time during 1962 on the dates recorded in the text. Those not so marked were reported previously under incomplete or incorrect identifications.

CHANCE IMMIGRANTS

BENEFICIAL INSECTS PURPOSELY INTRODUCED

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President-elect ..... Clifton J. Davis
Secretary ..... Dale H. Habeck
Treasurer ..... Mabel Chong
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D. T. Fullaway
C. E. Pemberton
P. H. Timberlake
R. H. Van Zwaluwenburg
F. X. Williams

MEMBERSHIP 1962

Abramovitz, Melvin
Anderson, R. D.
Arnaud, P. H., Jr.
Arthur, Mervyn
Au, Stephen
Balock, J. W.
Beardsley, J. W.
Bess, H. A.
Bianchi, F. A.
Bogen, Emil*
Boyle, W. W.
Bryan, E. H., Jr.
Butler, G. D., Jr.
Callan, E. McC.
Carter, Walter
Chilson, L. M.
Chong, Mabel
Christensen, L. D.
Clagg, C. F.
Clagg, Harry B.
Davis, C. J.
Dizon, Romeo
Dumbleton, L. J.
Einmo, J. R.
Faxon, Richard
Ford, E. J., Jr.
Fujimoto, Martin
Garcia y Martell, Celso
Gressitt, J. L.
Haas, Glen
Habeck, D. H.
Hagen, K. S.
Hamilton, D. C.
Haramoto, F. H.
Hardy, D. E.
Hinckley, A. D.
Hitchcock, J. C., Jr.
Holtmann, Heinrich
Holway, R. T.
Hoyt, C. P.
Huang, Shuch-Shiang
Ishii, Takashi
Ito, Kiyoshi
Joyce, C. R.
Kajiwara, J. T.
Kamasaki, Hitoshi
Kawanishi, Clinton
Keck, C. B.
Keiser, Irving
Kim, James
Kimoto, Shinsaku
Kohn, Marian A.
Komatsu, George
Krauss, N. L. H.
Laigo, Francisco
Lamprecht, Herbert
Leech, Robin
Lofgren, Laura
Look, W. C.
Lupton, D. W.
Maa, T. C.
Madinger, F. L.
Maehler, K. L.
Matsumoto, Barton
Matsushima, Richard
McGee, Louis
McKeand, R. J.
McMahan, E. A.
Messenger, P. S.
Mitchell Carl J.
Mitchell, Sue
Mitchell, Wallace C.
Miyahira, Nobuo
Miyatake, Yorio
Mumford, E. P.
Nakagawa, P. Y.
Nakagawa, Susumu
Nakao, Harry
Nakata, Setsuko
Namba, Ryoji
Newell, I. M.
Nishida, Toshiyuki
Nowell, W. R.
Ota, Asher
Owen, R. P.
Perkins, B. D., Jr.
Peterson, G. D., Jr.
Pullen, B. E.
Quate, L. W.
Rainwater, H. I.
Rodriguez-Velez, Joel
Ross, M. M.
Rutschky, Charles
Sakimura, Kanjyo
Samuelson, G. A.
Sanchez, F. F.
Sasakawa, M.
Sherman, Martin
Shiroma, E. S.
Steffan, Wallace
Steiner, L. F.
Stone, W. E.
Strandtmann, R. W.
Suehiro, Amy
Sugerman, B. B.
Tamashiro, Minoru
Tanabe, Alvin
Tanada, Yoshinori
Tanaka, Norimitsu
Thistle, Alan
Toba, H. S.
Tuthill, L. D.
Usinger, R. L.
Wilson, Nixon
Wilton, D. P.
Wirth, W. W.
Wolfenbarger, D. O.
Woolford, H. A.
Yamada, Teichi
Yano, Koji
Yoshimoto, C. M.
Yoshioka, Ernest
Ziegler, E. O.
Zimmerman, E. C.

*Deceased