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AN ANNOTATED BIBLIOGRAPHY OF PUERTO RICAN ENTOMOLOGY

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This is an attempt to gather together all the published references to the entomology and the insects of Puerto Rico. The year 1932 is covered but several titles which were due to appear early in 1933 are included even tho two or three of the citations may be some what incomplete. A total of 711 titles are listed. Of these the compiler has been able to examine all but 28; those not personally examined are indicated by an asterisk. A few of the references do not mention insects from Puerto Rico but have been included in order to correct published errors. They are placed in brackets.

The task of compilation has been greater than at first expected and without the generous help of several people the results would have been much less complete. Chief of these has been Prof. C. R. Crosby of Cornell University who has supplied many references and given great assistance in the final preparation of the manuscript. Mr. A. J. Mutchler, of the American Museum of Natural History, has located many references on Coleoptera thru his wide knowledge of the literature of this group which otherwise would have been overlooked. Mr. F. W. Watson of the same institution and Dr. W. T. M. Forbes of Cornell University have both helped with titles on Lepidoptera. Dr. Wm. A. Hoffman of the School of Tropical Medicine supplied abstracts of several references and Dean Carlos A. Figueroa of the College of Agriculture loaned several rare volumes dealing with early Puerto Rican agricultural literature. Acknowledgment is due to the following librarians: Miss Ida R. Hood of the American Museum of Natural History, Mr. W. W. Ellis, of the New York State College of Agriculture at Cornell, Miss Mabel Colcord of the United States Bureau of Entomology and to Mr. J. I. Otero of the Insular Experiment Station, as well as to their associates for many courtesies and for assistance in finding many of the publications consulted. Dr. Geo. N. Wolcott at the Insular Experiment Sta-

tion at Río Piedras has been good enough to go over the manuscript and proof and has made several corrections and additions.

Anonymous. 1903. Algunos remedios contra los principales insectos que atacan el tabaco. Dept. Interior P. R., Neg. Agr. y Minas, Bol. Agr. 17, pp. 5–12. San Juan, November.

An abstract in Spanish of U. S. Farmers' Bul. 120, 32 pp., 1900 by L. O. Howard on "The principal insects affecting the tobacco plant."

1904. Some injurious garden and field insects in tropical America. U. S. Dept. Agr., Bur. Ent. Bul. **44**: p. 84.

A brief record of the damage done by several injurious insects, specimens of which were sent to the Bureau in August 1903 by O. W. Barrett of the P. R. (Mayagüez) Agr. Exp. Sta. It is chiefly of interest because these records are probably the first published notes from this Station on injurious insects. They are as follows: an aphid on squash; the leaf-beetle, *Cerotoma denticornis* Ol., infesting cowpeas; *Systena basalis* Duv. inuring sunflowers and a leafhopper, *Agallia tenella* Ball, injuring beans, cowpeas and other plants.

(Pedreira in his Bibliografía Puertorriqueña gives the authorship of this paper to L. O. Howard but there is no evidence to show that it was written by him.)

*1911. Leyes y reglamentos concernientes a la importación e inspección de plantas, enfermedades de insectos y plagas en la Isla de Puerto Rico. Junta de Comisionados de Agricultura Puerto Rico Circ. No. 1 Div. of Ent. Bur. Supplies, Printing & Transp., 7 pp., San Juan. (Published in English & Spanish)

Compiled from Act 60, Special Session Legislative Assembly 1910 and Act 45, Legislative Assembly 1911.

Anon. (pob. Wetmore. Alex.) 1913. Useful birds of Porto Rico. Porto Rico Progress **4**(13) : 13, 14. San Juan, P. R.

A note on the control of the "changa" or mole cricket by herons. The article is probably by Alexander Wetmore.

1913 *b*. Destruction of mole crickets in Puerto Rico by the heron or gaulding. Agr. News, Barbados, B.W.I. **12**(298) : 314.

Note on Wetmore's article on Useful Birds in Puerto Rico abstracted from the Experiment Station Record, June 1913.

1915. Law and regulations pertaining to the importation of plants to the island of Puerto Rico. Plant Quarantine Regulations. Ins. Exp. Sta. P. R. Circ. **5**: 1. April 12.

1919 *a*. Análisis de insecticidas. Rev. Agr. P. R. **3**(5) : 61–62.

1919 *b*. Skunks and toads. Agr. News, Barbados, B.W.I., **18**: (458) : 361.

Mention is made of the abstract on p. 362 of the Rept. Div. Ent., Ins. Exp. Sta. P. R. for 1917–18, part of which refers to the possible introduction of the toad, *Bufo marinus* L., into Puerto Rico.

1919 *c*. Entomology in Puerto Rico. Agr. News, Barbados, B. W.I. **18**, (458) : 362–363.

The Ann. Rept. Div. Ent., Ins. Exp. Sta. P. R. for 1917–18 is abstracted.

1920. Estadística de los tanques de inmersión construídos en esta isla hasta junio 30, 1920. Rev. Agr. P. R. **5**(5) : 38.

Data on results of use of dipping tanks for the cattle tick.

1920. Quarantine department report on inspections and interceptions, all ports and stations, for the quarter ending March 31, 1920. Qtrly. Bul. Fla. State Plant. Bd. **4**(3) : 102–103.

Aspidiotus destructor intercepted 29 times on shipments from Cuba, Puerto Rico and the Isle of Pines.

1921. Report of the quarantine department from October 1, 1921, to December 31, 1921. Quart. Bul. State Plant Bd. Miss. **1**(4) : 17–24., 4 figs.

Lepidosaphes beckii intercepted from Puerto Rico on orange.

1923. Pests collected from imported plants and plant products from January, 1922 to December 31, 1922, inclusive.

Aleurothrixus howardi on banana and *A. floccosus* on citrus foliage from Puerto Rico.

1924. The effect of *Melinus minutiflora* on ticks. Ann. Rept. Ins. Exp. Sta. R. P. 1923–1924, pp. 102–103.

Account of an investigation on the effect of molasses grass on the cattle tick.

1924. Report of hearing held by the Federal Horticultural Board to consider the advisability of restricting or prohibiting the entry from Puerto Rico of fruits and vegetables into the United States. Jour. Dept. Agr. P. R. **8**(1) : 46. (Issued August 1925).

Reference is made to the West Indian Fruit Fly, *Anastrepha fraterculus* Wied. and to the lima bean pod-borer, *Maruca testulalis* Geyer.

*1925. Field studies and demonstrations in malaria control. Rockefeller Found. 11th. Ann. Rept. Intern. Health Bd. 1924, pp. 73–84, New York, January. (Abs. in Rev. Appl. Ent. B **14**: 51–52).

Conditions in Puerto Rico reported on, including the comparative abundance of the 3 species of Anopheles present.

1926. Studies of the malaria problem in Puerto Rico. P. R. Health Rev. **2**(5): 22–28. (Abs. in Pub. Health Repts. **42** (13): 897, Washington, D. C., April 1, 1927).

Influence of vegetation and small fish on mosquito abundance.

1927 *a*. Se introducen parásitos del taladrador de la caña de azúcar en Puerto Rico. Rev. Agr. P. R. **19**(1): 33. July.

A Spanish translation of a review in Facts About Sugar of an article by L. A. Catoni in Jour. Dept. Agr. P. R. 10:252–254, 1910 dealing with parasite introduction into Puerto Rico.

1927 *b*. Insect pests of sugar cane (including utilization of parasites). Proc. 2nd. Conf. Internat. Soc. Sugar Cane Technol., pp. 57–62, Havana, Cuba Sugar Club.

A record of a preliminary meeting of the committee for the section on insect pests of sugar cane at which there was a general discussion of borers, mostly *Diatraea saccharalis* Fab.; losses and the factors causing them for various countries are discussed, among which it is stated that in Puerto Rico the infestation is inversely proportional to rainfall.

1927 *c*. Studies of the malaria problem in Puerto Rico. P. R. Health Rev. **2**(8): 25–32.

Malaria investigations in 1924 and 1925 which include notes on *Anopheles grabhami* Theo. and *A. vestipennis* D. & K.

*1927 *d*. Studies in the malaria problem in Puerto Rico. P. R. Health Rev. **2**(10): 27–32 and **2**(12): 25–31. (Abs. in Rev. Appl. Ent. B 16 p. 64 and in U. S. Pub. Health Rep. **42**(39): 2395 and **42**(51): 3142).

Notes on the comparative abundance, numerical and seasonal, and biting and breeding habits of the 3 species of *Anopheles* present.

1928 *a*. Algunas consideraciones sobre la industria apícola. Rev. Agr. P. R. **21**(2): 56, 82.

Notes on beekeeping in Puerto Rico.

1928 *b*. Sugestiones a los principiantes en apicultura. Rev. Agr. P. R. **21**(4): 153, October.

Brief suggestions on beekeeping.

1928 *c*. Report of bureau of malaria control 1926–27. P. R. Rev. Pub. Health & Trop. Med. **3**(7): 279–286; **3**(9): 376–385. (Abstracted in Rev. Appl. Ent. 16: 239 and 209 respectively and the former also in U. S. Pub. Health Repts. 43(30): 1992–1993, 1928).

Notes on the breeding and habits of the 3 species of *Anopheles* present.

*1929. Report of bureau of malaria control 1926–27. Rept. Comm. Health P. R. 1926–27, pp. 62–95. (Abs. in Rev. Appl. Ent. B **17**: 218).

Drainage problems discussed; tests of durability of screening materials; Paris green at weekly intervals for *Anopheles albimanus* too infrequent.

1931. El gorgojo del ñame del guineo. Bol. Agr. (P. R. Dept. Agr.) **1**(4): 3–4.

Brief report on the results of a survey of 3 districts to determine the amount of infestation by the banana root-weevil.

1932. Florida beetle put to test, curbing P. R. citrus pest. The Produce News, June 11, New York, front page.

Brief note on original shipment of Australian lady beetles, *Rodolia cardinalis*, to Puerto Rico by the Florida State Plant Board for the control of *Icerya purchasi* on citrus.

***Abad, José Ramón.** 1885. Puerto Rico en la exposición de Ponce en 1882. Memoria redactada de orden de la Junta Directiva de la misma, 351 pp. El Comercio, Ponce, P. R. (Reference from Colón, E. D. 1930).

Suggestions for the proper care of bees are given and it is stated that some of the people are engaged in beekeeping.

Abbad y Lasierra, Fray Iñigo. 1788. Historia geográfica, civil y natural de la isla de San Juan Bautista de Puerto Rico, 508 pp. + X, Madrid. (Nueva Edición, anotada en la parte histórica y continuada en la estadística y económica por José Julián de Acosta y Calbo, Puerto Rico, 1866).

Chapter 35 deals briefly with the natural history of the Island; on pp. 457–462 is probably the earliest general account of the more important groups of insects present with special reference to those annoying to man and animals; no scientific names are given.

Aldrich, J. M. 1905. A catalogue of North American Diptera. Smithsonian Miscl. Coll., part of Vol. **46**, (1444), 680 pp.

Records all West Indian species described thru 1903, including many from Puerto Rico.

Alexander, C. P. 1912. A peculiar new crane fly from Puerto Rico. Psyche 19 : 63–66, 1 pl.

Megistomastix portoricensis as a new genus and species.

1913. A synopsis of part of the neo-tropical crane-flies of the subfamily Limnobiinae. Proc. U. S. Nat. Mus. Vol. **44** (1966) : 501.

Mongoma niveitarsus as a new species from Puerto Rico.

1914. A revision of the American species of Tanypremna Osten Sacken and Megistocera Wiedemann. (Tipulidae, Diptera). Jour. N. Y. Ent. Soc. **22**(3) : 216–217.

Megistocera longipennis Macq. listed from Puerto Rico on the authority of Roeder.

1932. The craneflies of Puerto Rico. Jour. Dept. Agr. P. R. **16**(4) : 347–387.

Ashmead, W. H. 1900. Report on the aculeate Hymenoptera of the islands St. Vincent and Grenada, with additions to the parasitic Hymenoptera, and a list of the described species of the West Indes. Trans. Ent. Soc. London for 1900 Pt. 2 (July), pp. 207–368.

Lists many species from Puerto Rico.

Aubé, Ch. 1844. Revision de la famille des Pselaphiens. Ann. Soc. Ent. France, 2 Ser., Vol. **2**, p. 120.

Reichenbachia usera listed from Puerto Rico (as Bryaxis).

Aurivillius, Chr., Wagner, H. and **Strand, E.** 1911 to date. Lepidopterorum Catalogus. Berlin.

Forty odd Fascicles have appeared to date by various authors in which many species are listed as specifically occurring in Puerto Rico.

Bagué, Jaime. 1918. Extirpación de la garrapata. Rev. Agr. P. R. **1**(1 and 2) : 81–85. (Also as Est. Exp. Ins. P. R. Circ. **18**, 12 pp., 1919.)

Notes on the campaign against the cattle tick.

1920. Annual report of the veterinary inspector. Ann. Rept. Ins. Exp. Sta. 1919–20, pp. 95–101.

Report on dipping vats for cattle tick eradication.

1921. La piroplasmosis o fiebre tejas. Ins. Exp. Sta. P. R. Circ. **45**, 5 pp.

Only reliable method for control of Texas fever in Puerto Rico is extermination of the cattle tick; the value of arsenical dips is discussed.

1929. ¿Garrapata o ganado? Sección española del Boletín de la Unión Panamericana, April. (From Pedreira p. 208). (Also in the Rev. Agr. P. R. **22**(10) : 139, April, 8 figs.)

A general account of the cattle tick problem with special reference to the situation in Puerto Rico and methods adopted for handling it there.

* **Baldorioty de Castro, Román.** 1865. Memoria descriptiva de la cuarta feria y exposición pública de la agricultura, la industria y las bellas artes de la isla de Puerto Rico. By the Secretary of the Commission. San Juan, P. R. (Reference from Colón, E. D. 1930, p, 21, ref. no. 41, and p. 156).

At the fourth public exposition held in the Island in 1865 Don Alejo Fernández of Aguadilla exhibited wax and honey as the products of 250 hives of bees.

Ballou, H. A. 1913. Root borers and other grubs in West Indian soils. Imp. Dept. Agr. W. I., Pamphlet Ser. No. 73, 38 pp.

Puerto Rican references: brief notes on *Lachnosterna sp.*, p. 17; *Diaprepes spengleri* listed as injurious, p. 36; *Lachnosterna* listed as injurious, p. 37; *Strategus titanus* listed as injurious, p. 38.

1915. Notes on Puerto Rico insects. Agr. News, Barbados, B. W. I., August 28, 14, (348), p. 282.

Abstracts are given of P. R. Bd. Comm. Agr. Circ. 6 by Crossman and Wolcott on the changa and of U. S. D. A. Bul. 192 by T. H. Jones on Vegetable Insects in Puerto Rico, both of which see.

1916. Dangerous hard-backs. Agr. News, Barbados, 15 (359) : 42–43, 5 figs.

The injury to sugar cane roots in Puerto Rico by *Strataegus titanus* is referred to.

Baly, J. S. 1886. Descriptions of uncharacterized species of Diabrotica. Trans. Ent. Soc. London, Pt. 4, pp. 443–444.

D. graminea described as a new species from Puerto Rico.

Banks, Nathan. 1901. Some spiders and other Arachnida from Puerto Rico. Proc. U. S. Nat. Mus. **24**: 217–227, 1 pl.

Report on a collection made by August Busck; 49 species of spiders and 5 other arachnids treated, of which 4 species of spiders are described as new.

1917. New mites, mostly economic (Arach., Acar.). Ent. News **28**(5): 194, pl. 14, fig. 5 and pl. 15, fig. 13.

Tetranychus antillarum described as a new species from leaves of *Leonotis nepetafolia* and *Asclepias curassivica* from Puerto Rico.

1919. Antillean Isoptera. Bul. Mus. Comp. Zool. **62**(10): 484–489.

Nasutitermes creolina from Vieques Id. and P. R. and *N. discolor* from Culebra Id. and El Yunque, both as new species (paratypes) and *N. morio* listed from Puerto Rico.

Banks, N. and **Snyder, T. E.** 1920. A revision of the nearctic termites. U. S. N. Mus. Bul. **108**, p. 82.

Nasutitermes costaricensis Holmg. listed from Puerto Rico.

Barber, H. G. 1923. A preliminary report on the Hemiptera Heteroptera of Puerto Rico collected by the American Museum of Natural History. Am. Mus. Novitates No. 75, 13 pp.

Several new species described.

Barber, H. G. and **Bruner, S. C.** 1932. The Cydnidae and Pentatomidae of Cuba. Jour. Dept. Agr. Puerto Rico, **16**(3): 231–284, pl. 25, fig. 1.

Geocoris reversus new species, type and paratypes from Mayagüez, Río Piedras and Isabela, P. R.

Barrett, O. W. 1902. The changa or mole cricket. (*Scapteriscus didactylus* Latr.) in Puerto Rico. P. R. Agr. Exp. Sta. (Mayagüez) Bul. **2**, 19 pp., 1 fig. (Also a Spanish edition).

1904. Control of the brown ant (*Solenopsis geminata* Fab.) in orange orchards. (Also a Spanish edition). P. R. Agr. Exp. Sta. Circ. **4**, 3 pp.

Brief account of life-history, injuries and remedial measures.

1906. Report of the entomologist and botanist. Investigations in entomology and plant pathology. P. R. Agr. Exp. Sta. (Mayagüez), Rept. for 1905, pp. 22–23.

First record of *Zagrammosoma multilineata* Ashm. parasitic on the coffee leaf-miner; cotton leaf worm parasitized by *Chalcis annulata* Fab.

1928. The tropical crops. MacMillan Co., New York, 445 pp.

Many references thruout to the principal injurious insects of Puerto Rico.

Barrow, E. H. 1924. White grubs, *Lachnosterna* sp., and larvae of the weevil root-borer, *Diaprepes spengleri* L., attacking sugar cane in the Guánica district of Puerto Rico and methods for controlling them. Jour. Dept. Agr. P. R. **8**(2): 22–26.

Bastón, J. 1928. Produciendo mosquitos. Rev. Agr. P. R. **20**(5): 239 and 245.

Notes on breeding and control of mosquitoes.

Berger, E. W. 1921. Natural enemies of scale insects and whiteflies in Florida. Qrtly. Bul. Fla. State Plant Bd. **5**(3): 147–148, fig. 18.

Eucalymnatus tesselatus is recorded as being found infested by the fungus, *Aschersonia cubensis*, in material received from Puerto Rico.

Bigot, J. 1877. Dipteres nouveaux ou peu connus. IX. Ann. Soc. Ent. France, Ser. 5, Vol. **7**, p. 46.

Lucillia semiviolacea as a new species from Puerto Rico (as *Somomyia*).

Bishoff, Augusto. 1918. Extirpación de la hormiguilla. Rev. Agr. P. R. **1**(1 and 2): 38–42.

Suggestions for the control of ants.

Blake, Doris H. 1928. Notes on some West Indian Chrysomelidae. Bul. Brooklyn Ent. Soc. **23**: 93–98.

Dysonychia spilotrachela as a new species from Haiti and Puerto Rico.

Boheman, C. H. 1865. Monographia Cassididarum **3**: 333–334.

Coptocycla glaucina as a new species from Puerto Rico.

* **Bovel, J. R.** 1918. Report of the Department of Agriculture, Barbados, for 1916–1917, 62 pp. (Abs. in Rev. Appl. Ent. **6**: 393).

Stated that related species of *Diaprepes* and *Phytalus*, so trouble-

some to cane in Barbados, are on the increase in Puerto Rico and very injurious there.

* **Bovel, J. R.** and **d'Albuquerque, J. P.** 1917. Report on the sugar-cane experiments for the season 1915–1917. Dept. Agr. Barbados, 79 pp, 56 tables. (Abs. in Rev. Appl. Ent **6**: 58.)

Varietal and manure experiments inconclusive because of severe injury by *Diaprepes* and *Phytalus*. Stated that in Puerto Rico the the cost for handpicking for their control in one small district was about $6,000 and yet they increased.

***Box, H. E.** 1924. Report upon a trip to Puerto Rico, April-July, 1924, 22 pp., Berbice, British Guiana, S. Davson & Co., Ltd., November (Abs. in Rev. Appl. Ent. 13: 86).

Record of a trip made to study the Tachinid, *Lixophaga diatraeae* Towns., and to transport it into British Guiana; notes on the principal sugar cane insects of Puerto Rico and their parasites, especially *L. diatraeae*, including some observations on its distribution and incidence there.

1925. Porto Rican cane grubs and their natural enemies, with suggestions for the control of Lamellicorn larvae by means of wasp parasites (Scoliidae). Jour. Dept. Agr. P. R. **9**(4): 291–356.

*1927 *a*. Notas sobre dos insectos perjudiciales a las matas de café en Venezuela, 19 pp., 10 figs., 11 refs., Caracas, Cámara de Comercio, March. (Abs. in Rev. Appl. Ent. **15**: 324).

In discussing the green scale, *Coccus viridis* Green, in Venezuela it is stated that *Azya orbigera* Muls., a well-known Coccinellid predaceous on various Coccids in South America, has been sent to Puerto Rico for possible establishment.

1927 *b*. Eleventh report upon entomological work, 24 pp., typescript. Central Aguirre, P. R., Central Aguirre Sugar Co., April 9th. (See abs. in Rev. Appl. Ent. **15**: 412–414.)

A detailed account of a trip to South America during January–April, 1927 to make further introductions of Braconid parasites of *Diatraea* and Scoliid parasites of cane grubs into Puerto Rico. Notes on *Diatraea* and its parasites in Venezuela are given together with notes on conditions on Puerto Rico that affect their introduction and establishment. (For another account of this trip see Catoni 1927.)

*1927 *c*. The moth borer problem in Barbados. A discussion and a recommendation. Dept. Sci. and Agr. Barbados, 5 pp.,

multigraph, Barbados, March 25. (Abs. in Rev. Appl. Ent. **15**: 430.)

Refers to the occurence of *Lixophaga diatraeae* in Puerto Rico as a parasite of *Diatraea saccharalis* and states that this parasite has apparently reached the limit of its effectiveness there. It is suggested that its introduction should be attempted from Puerto Rico into Barbados.

1928 *a*. Observations upon *Lixophaga diatraeae* Townsend, a Tachinid parasite of *Diatraea saccharalis* Fabr. in Puerto Rico. Bul. Ent. Res. **19**: 1–6, 1 fig.

1928 *b*. The introduction of Braconid parasites of *Diatraea saccharalis* Fabr. into certain of the West Indian Islands. Bul. Ent. Res. **8**(4): 365–370, 1 pl., 2 figs.

A further detailed account of the collection, rearing, shipment and introduction of Braconid parasites of *Diatraea saccharalis* F. into Puerto Rico as well as into Barbados, Antigua and St. Kitts. Stated that *Microdus diatraeae* Turner has already become established on the South Coast of P. R.; present paper deals mostly with *Ipobracon grenadensis* Ashm.

1931. The Crambine genera *Diatraea* and *Xanthopherne* (Lep., Pyral.). Bul. Ent. Res. **22**: 1–50, 5 pls.

Diatraea saccharalis Fab., pp. 22–26, synonymy, description and distribution, including Puerto Rico in its known range.

Bradt, Schuyler. 1932 *a*. Notes on Puerto Rican blackflies. P. R. Jour. Pub. Health & Trop. Med. **8**(1): 69–81(2–11), 5 figs.

Original observations on the habits and development of *Simulium quadrivittatum* Loew with descriptions of its stages; brief notes also on *S. haematopotum* Lw. and *S. minusculum* Lutz.

1932 *b*. Nota sobre la mosca negra en Puerto Rico. P. R. Jour. Publ. Health & Trop. Med. **8**(1): included in 69–81 (pp. 12–14 of reprint).

This is an abstract in Spanish of the preceding.

Brau, Salvador. 1930. La colonización de Puerto Rico desde el descubrimiento de la isla hasta la reversión a la corona española de los privilegios de Colón. San Juan, P. R., pp. 296–298.

Brief references to great injury to bananas by ants in the early part of the 16th century; also to oranges and "cañafístula"; it is stated that the ants were so bad in houses that the residents of Caparra advanced this as one of the principal arguments for wanting

to move their city to the "Isleta"—the present site of the city of San Juan.

Brau Zuzuarregui, Mario. 1922. Pájaros útiles y perjudiciales a la agricultura. Rev. Agr. P. R. **8**(5&6) : 13–18, 27–32; **9**(2&3) : 25–31, 17–20, 11 figs.

Brief account of the various insectivorous birds of Puerto Rico that should be protected, including several specifically mentioned as important enemies of *Scapteriscus vicinus, Diatraea saccharalis, Heliothis obsoleta, Laphygma frugiperda* and of *Phyllophaga* (*Lachnosterna*) spp.

1928. Divagaciones entomológicas. Rev. Agr. P. R. **21**(6) : 211 and 239–240, 1 fig.

Brenner, Henry. 1916. Puerto Rico and its beekeepers. Am. Bee Jour. **56**: 380–381, 2 figs.

1918. Puerto Rican beekeeping. Am. Bee Jour. **58**: 51–52, 4 figs.

Brief general account.

Britton, N. L. 1930. Scientific survey of Puerto Rico and the Virgin Islands. Jour. N. Y. Bot. Gard. **31**: 167.

Brief note on entomological progress during winter and spring of 1929–30.

1931. Recent scientific observations in Porto Rico. Jour. N. Y. Bot. Gard. **32**: 192.

Brief note on the present status of the entomological part of the Sci. Surv. of P. R. and the Vir. Ids. and progress during winter and spring of 1930–31.

Brown, F. Martin. 1929. A revision of the genus *Phoebis* (Lepidoptera). Am. Mus. Novitates No. 368, pp. 8–9, 20.

P. cubule sennae female form *sennalba* described as a new form from Puerto Rico (a paratype).

1931. A revision of the genus *Aphrissa*. Am. Mus. Novitates No. 454, p. 5, Feb. 9.

A. godartiana Swainson mentioned as occurring in Puerto Rico.

Bryant, G. E. 1924. New species of phytophaga (Coleopt.) Ann. and Mag. Nat. Hist. Ser. 9, **41**: 244–252.

Galerucella wolcotti described as a new species from Puerto Rico.

Brunner von Wattenwyl, C. 1865. Nouveau systeme des Blattaires, p. 63. (Vienna).

Anaplecta dorsalis as a new species from Puerto Rico.

1895. Monographie der Pseudophylliden. Wien. p. 233, pl. IX, fig. 101.

Polyancistrus serrulatus P. de B. (Locustidae) listed from Puerto Rico.

Brunner von Wattenwyl, C. and **Redtenbacher, Jos.** 1908. Die Insektenfamilie der Phasmiden, pp. 357, 435.

Dyme krugiana from the main island, *Lamponinus bocki* from Mona Island and *Diapherodes longiscapha* from the main island, all as new species.

Burmeister, G. 1839. Handbuch der Entomologie, **2**: 753. (Berlin).

Psalis americana vár. *gagathina* as a new variety from Puerto Rico (=*P. buscki* Rehn) Forficulidae.

Busck, August. 1900. Notes on a brief trip to Puerto Rico in January and February, 1889, including a "List of Coccidae collected by Mr. A. Busck in Puerto Rico, 1889" by T. Pergande and T. D. A. Cockerell. U. S. Bur. Ent. Bul. **22** (N. S.), pp. 88–93.

Butterweck, O. C. 1902. El cultivo del tabaco. Dept. Int. P. R., Neg. Agr. y Minas, Bol. Agr. 2 pp. 18–19.

A Spanish translation of U. S. Farmers' Bul. 82 "The Culture of tobacco," 1898, which contains brief general directions for the control of the more important insect pests.

del Campo, Alberto. 1923. La industria de la seda. Rev. Agr. P. R. **11**(1) : 17.

Camuñas, Manuel. 1919. Report of the Commissioner of Agriculture and Labor. 19th Ann. Rept. Gov. P. R. to Secy. War, Washington, D. C., 1919, Appendix IX, pp. 685–707.

Notes are included on citrus insects and their control and on experiments in insect transmission of sugar cane mosaic.

1921. A los agricultores de Puerto Rico y especialmente a los cosecheros de algodón. Rev. Agr. P. R. **7**(3) : 5–7.

A note regarding pink bollworm control.

Carnes, E. K. 1912. Insectary division, report for the month of May 1912. Cal. State Comm. Hort. Bul. **1**(8) : 398.

Reports *Chrysomphalus aonidum* L. and *Lepidosaphes beckii* received from C. W. Hooker from Puerto Rico from which *Aspidiotiphagus citrinus* issued in considerable numbers but in a second shipment very few *citrinus* issued.

Carrión, Arturo L. *1927. Preliminary report on a rat and flea survey of the City of San Juan, Porto Rico. P. R. Rev. Pub. Health & Trop. Med. **3** : 131–145. (Reference and abstract from Wm. A. Hoffman).

During the first year of Survey 360 live rats were trapped on 53.6% of which fleas were found; practically all were *Xenospsylla cheopis* with an occasional *Ctenocephalus* and a few *Echidnophaga gallinacea;* "cheopis index" for the year quite high—7.05.

*1928. Preliminary report on a rat-flea survey of the City of San Juan, Puerto Rico. Second paper. P. R. Rev. Pub. Health & Trop. Med. **4**(2) : 84–92, 7 charts. (Abs. in Rev. Appl. Ent. **17** : 26).

Covers period of July 1927 thru June 1928; 53% of rats captured had fleas; of 2,600 fleas which were determined 99.5% were *Xenopsylla cheopis* Roths., the remainder being *E. gallineacea, Ct. canis or felis, Pulex irritans* and *Leptopsylla sengis* Schonh. (*musculi* Dug.); the flea index and cheopis index for the year were practically the same—6.6. *Mus alexandrinus* revealed the highest infestation for the year.

*1929. Third report on a rat-flea survey of the City of San Juan, Puerto Rico. P. R. Jour. Pub. Health & Trop. Med. **5**(2) : 158–166, 7 charts. (Abs. in Rev. Appl. Ent. B **18** : 248; also by same title in Pub. Health Rept. **45**(27) : 1515–1520, 7 charts, Washington, D. C., July 4.)

Xenopsylla cheopis Roths. (over 500 per cent of total number caught), *Echidnophaga gallinacea* Westw. *Ctenocephalus canis* Curt. or *C. felis* Bch. and *Pulex irritans* L. found on 60 per cent of rats captured.

*1932. Final report on a rat-flea survey of San Juan, Porto Rico. Publ. Health Repts. **47** : 193–201, Washington, D. C. (Reference and abstract received from Dr. Wm. A. Hoffman).

This survey includes 3 consecutive years of work, during which period a total of 1,605 live rats were captured; of these 72 per cent were classed as *Rattus norvegicus* and *R. alexandrinus* in proportions of 13 and 15 per cent respectively. Fleas were obtained from almost 57 per cent of the rats, the total number for the 3 years being 7,145 or an index of 7.1 fleas per rat. Five species of fleas were encountered but of these *Xenopsylla cheopis* composed 98.5 per cent of the total catch. The concentration of rats is heaviest at the water-front and in the residential sections while the flea index is highest at the docks (almost 14 fleas per rat) and in the commercial district (almost 6 fleas per rat).

Catoni, L. A. 1920 *a*. Plagas de insectos que atacan a los árboles del género citro en Puerto Rico y cómo combatirlos. Rev. Agr. P. R. 5(4) : 35–39.

A brief popular account of the more important insects injurious to citrus in Puerto Rico and methods of control.

1921 *b*. Dos plagas de algodón que no queremos en Puerto Rico. Est. Exp. Ins. P. R. Circ. **41**, 9 pp.

Refers to the pink boll worm and the boll weevil of cotton not found up to that time in Puerto Rico.

1921 *c*. El gas hidrociánico como agente fumigante. Rev. Agr. P. R. **5**(7) : 27–36.

Directions for the preparation and use of hydrocyanic acid gas.

1921 *d*. Insectos que atacan al hombre. Rev. Agr. P. R. **6**(2) : 47–49.

Brief popular account of the more important insects annoying to man in Puerto Rico.

1921 *e*. Insectos que atacan al algodón. Rev. Agr. P. R. **6**(3) : 25–31.

Brief popular account of the more important cotton insects in Puerto Rico.

1921 *f*. Plagas de insectos que atacan la palma de coco. Rev. Agr. P. R. **7**(3) : 21–25.

Brief popular account of the more important insects attacking the coconut in Puerto Rico.

1921 *g*. Plagas de insectos que atacan la planta del tabaco. Rev. Agr. P. R. **7**(5) : 45–50.

Brief account of the more important tobacco insects in Puerto Rico.

1921 *h*. A los cosecheros de algodón en Puerto Rico. Rev. Agr. P. R. **7**(6) : 25–26.

Brief notes of information for the cotton growers concerning the

presence of the pink bollworm in Puerto Rico and an interception of the boll-weevil.

1921 *i*. Plant inspection and quarantine report. Ins. Exp. Sta. P. R. Bul. **27**, 23 pp. (also a Spanish edition 25 pp.).

1922 *a*. Informe de las actividades de la campaña de eradicación del gusano rosado en Puerto Rico llevada a cabo por el departamento de agricultura y trabajo. Rev. Agr. P. R. **8** (4) : 15–22.

Notes on a clean-up campaign against the pink bollworm.

1922 *b*. Plagas de insectos que atacan a las plantaciones de batatas. Rev. Agr. P. R. **9**(3) : 25–28.

Brief account of the more important sweet-potato insects in Puerto Rico and their control.

1922 *c*. Medidas para combatir las plagas de insectos. Rev. Agr. P. R. **9**(4) : 33–36.

Brief directions for the preparation and use of a few of the more important insecticides.

1922 *d*. Situación existente de varias plagas de insectos de los Estados Unidos. Rev. Agr. **9**(4) : 43–45.

1923 *a*. Aparatos apropriados para combatir las plagas de insectos. Rev. Agr. P. R. **10**(1) : 27–29.

Suggestions for various types of spray machines for use against injurious insects.

1923 *b*. Insectos que atacan a los animales domésticos. Rev. Agr. P. R. **10**(3) : 35–39.

Brief account of the more important insects attacking domestic animals with suggestions for their control.

1923 *c*. Gorgojos que atacan a las habichuelas y guisantes. Rev. Agr. P. R. **10**(3) : 49–51.

Brief account of pea and bean weevils with suggestions for their control.

1923 *d*. Las chinches harinosas y los métodos de combatirlas. Rev. Agr. P. R. **10**(5) : 35–37.

Brief account of mealybugs affecting citrus, cane and other plants in the Island and suggestions for their control.

1923 *e*. El picudo del aguacate. Rev. Agr. P. R. **11**(6) : 55–56.

Brief account of the avocado weevil, *Heilipus lauri*, in Puerto Rico.

1924. Informe del servicio de inspección y cuarentena de plantas (1922–1923). Dept. Agr. P. R. 23 pp.

1927. Informe del viaje verificado a Venezuela con objeto de introducir parásitos para combatir el taladrador de la caña de azúcar en Puerto Rico. Rev. Agr. P. R. **18**(5) : 252–254.

Notes on a trip to Venezuela with H. E. Box to collect and introduce into Puerto Rico parasites of the sugar cane borer.

Caudell, A. N. 1905. A new roach from Puerto Rico. Can. Ent. **37**(6) : 237.

Ischnoptera adusta, type a male from Arroyo, Feb. 1889 (A. Busck).

1907. On some Forficulidae of the United States and the West Indies. Jour. N. Y. Ent. Soc. **15**(3) : 168.

Anisolabis minuta as a new species from Puerto Rico.

1912. Notes on the Mantid genus *Gonatista* Sauss. Psyche **19** (5) : 160–162.

Gonatista reticulata Thunberg mentioned as occurring in Puerto Rico.

Chamberlin, R. V. 1917. New spiders of the family Aviculariidae. Bul. Mus. Comp. Zool. **61**(3) : 39–40, pl. 2, fig. 7.

Cyrtopholis portoricae described as a new species from Puerto Rico.

1922. Notes on West Indian millipèdes. Proc. U. S. Nat. Mus. **61**, Art. 10, (2431) : 1–15.

Glomeridesmus concolor Chamb., El Yunque 1900 and *Prostemmiulus compressus* Karsch, El Yunque and Adjuntas, 1900, p. 1; *Epinannolene trinidadensis* Chamb., San Juan, 1899 and *Orthoprus sculpturatus* Karsch, Lares, 1899, p. 3; *Rhinocricus arboreus krugii* Karsch, El Yunque, 1900 and *R. arboreus gundlachii* Karsch, El Yunque, Pueblo Viejo, Manatí and Vega Baja, p. 9; *Microspirobolus richmondi* new species, El Yunque, 2,800 ft., 1900, p. 13; *Ricodesmus stejnegeri* new genus and species, El Yunque, La Muda and Lares, p. 15.

Champion, G. C. 1898. A list of the clavicorn Coleoptera of St. Vincent, Grenada, and the Grenadines. Trans. Ent. Soc. London for 1898, p. 401.

Pycnomerus exaratus Chev. listed as occurring in Puerto Rico.

Chapin, E. A. 1930. *Canthonella*, a new genus of Scarabeidae (Coleoptera). Am. Mus. Novitates No. 409, March 18, 2 pp.

C. parva as a new species from Puerto Rico.

1932. Revision of the pleurostict Scarabeidae of Cuba and Isle of Pines. II. Rutelinae, Dynastinae, and Cetoniinae. Ann. Ent. Soc. Am. **25**(2) : 282–314, 3 pls.

Dyscinetus picipes Burm., pp. 293–294, described; the type locality stated as Puerto Rico; it is said to be common in this Island.

Chapuis, F. 1866. Monograph des Platypides. Mem. Soc. Royal des Sci. Liége, 20 : 181–182.

Platypus schaumi as a new species from Puerto Rico.

Chardon, Carlos E. 1923. Report of the special pathologist. Ann. Rept. Ins. Exp. Sta. P. R. for 1921–22, pp. 61–68. (Also a Spanish edition, pp. 67–74, 1922.)

A report on a study of the factors affecting the spread in the field of sugar cane mosaic, including periodic observations on all possible insect vectors made in 40 observation fields.

1924. Stahl, Agustín. Rev. Agr. P. R. **12**(2) : 68–84.

A biographical sketch of the outstanding naturalist of Puerto Rico in which reference is made to his contributions to the knowledge of the insect fauna of the Island.

Chardon, C. E. and **Veve, R. A.** 1923. The transmission of sugar cane mosaic by *Aphis maidis* under field conditions in Puerto Rico. Phytopathology **13**(1) : 24–29, 1 fig.

Chevrolat, L. A. A. 1864. Coléopteres de l'îsle de Cuba. Notes synonymies et descriptions d'especes nouvelles. Cinquieme mémoire. Ann. Soc. Ent. France Ser. 4, Vol. 4, p. 414.

Psammodius gracilis as a new species from Cuba, Puerto Rico and Guadeloupe.

Chevrolat, M. Aug. 1876. Donne la description de Curculionites provenant des captures de M. le docteur Gundlach á l'île Porto-Rico. Ann. Soc. Ent. France, Ser. 5, Vol. **6**, Bulletin, pp. (227–229) CCXXVII–CCXXVIX.

Pachneus roseipes, Lachnopus trilineatus, Anchonus angulicollis, Attelabus (Euscelis) sexmaculatus, and *Anthonomus dentipennis* as new species from Puerto Rico and 5 other species also listed as occurring there.

1877. Descriptions of new species of Heteromera from the island of Puerto Rico collected by Dr. Gundlach. Bul. Soc. Ent. France, Ser. 5, Vol. **7** : 8–10.

Diastolinus fuscicornis, Notoxus bipunctatus, Emenadia melanoptera, Epicauta annulicornis, E. obscuripennis and *Oxacis geniculata* as new species from Puerto Rico.

Notoxus dentipennis Chev. cited by Gundlach and copied by Wolcotton page 85 of this "List" is probably in error for *N. bipunctatus* Chev. since there seems to be no reference to a species of this name other than by the two authors mentioned above.

Chittenden, F. H. 1919. The rice moth. U. S. Dept. Agr. Bul. 783, 15 pp.

Puerto Rican records of *Coreyra cephanolica* Staint, in rice sacks.

Cintrón, M., and **Marques, N.** 1926. Resultados obtenidos en la demostración número 91 sobre "represión del gorgojo del maíz". Rev. Agr. P. R. **17** : 18, November.

Results of a demonstration in the control of the corn weevil.

Clark, B. Preston. 1919. Some undescribed Sphingidae. Proc. New Eng. Zool. Club, **6** : 100–101, pl. X, fig. 1.

Protoparce brontes Drury var. *smythi* as a new subspecies from Río Piedras, P. R.

1922. Twenty five new Sphingidae. Proc. New Eng. Zool. Club, **8** : 8–9.

Isognathus rimosa Grote var. *wolcotti* as a new variety from Puerto Rico.

Clark, Hamlet. 1860. Catalogue of Halticidae in the collection of the British Museum. (London), p. 131.

Aedmon sericellum as a new species from Puerto Rico.

Cockerell, T. D. A. 1895. Miscellaneous notes on Coccidae. Can. Ent. **27**(9) : 253–261.

Aspidiotus destructor Sign. listed from Puerto on coconut palm as the first Coccid record for the Island.

1910. Some bees of the genus Augochlora from the West Indies. Proc. U. S. Nat. Mus. Vol. **37**, (1717) : 493.

Augochlora buscki as a new species from Puerto Rico.

1919. Bees in the collection of the United States National Museum. -3. Proc. U. S. Nat. Mus. Vol. **55**, (2264) p. 209.

Agapostemon radiatus portoricensis as a new subspecies from Puerto Rico.

Coll y Toste, Cayetano. 1914. A memoria in the Boletín Histórico de Puerto Rico 1 : 303.

In this memoria prepared by Dr. Coll y Toste he copies the Cédula

de Gracia (Decree of Grace) of August 10, 1815, Article 31 of which provides that the Governor of Puerto Rico establish a Quarantine against the introduction of ants and appointed two qualified persons to examine all incoming baggage, passengers and ships. This is probably the first quarantine in Puerto Rico against an injurious insect. (Leonard 1932 f. gives a translation of this decree in full).

Colón, E. D. 1919 *a*. El sulfato de amoníaco como insecticida. Est. Exp. Ins. P. R. Circ. **15**, 6 pp.

Notes on the possibility of using sulfate of amonia in Puerto Rico for the control of white grubs in sugar cane and at the same time as a fertilizer.

1919 *b*. Report of the director—Division of entomology, review of its work. Ann. Rep. Ins. Exp. Sta. P. R. for July 1, 1917 to June 30, 1918, pp. 29–59.

An excellent review, presented in considerable detail, of the work of Division of Entomology from its establishment up to that time.

1930. Datos sobre la historia de la agricultura de Puerto Rico antes de 1898, viii + 302 pp., Cantero Fernández y Cía., San Juan, P. R.

On pp. 155–159 are notes regarding the introduction of bees into the Island and on apiculture based mostly on the writings of Ledru and of J. R. Abad. On pp. 227–232 brief reference is made to insecticides recommended and to several of the more important injurious insects; these are mostly on the authority of López Tuero and Herrera, which see. On p. 276 are one or two brief quotations from J. R. Abad on early (1854) attempts to produce silk in Puerto Rico.

1931. Informe anual del comisionado de agricultura y comercio correspondiente al año fiscal 1930–1931, (Puerto Rico), pp. 18–19, 95–109, 122–124.

A brief review of entomological activies of the Insular Experiment Station and the Plant Quarantine Section during the period covered.

Colón, Isidoro A. 1919 *a*. Insecticidas y fungicidas. Est. Exp. Ins. P. R. Bol. **20**: 1–23.

Chemical notes on some of the more common insecticides and a table of analyses of samples examined from different sources in Puerto Rico.

Cook, Mel. T. and **Dozier, H. L.** 1925. Spraying citrus fruits in Porto Rico. Ins. Exp. Sta. P. R. Circ. **88**: 1–23.

Coquillett, D. W. 1899. New genera and species of Nycteribidae and Hippoboscidae. Can. Ent. **31**: 333–336.

Aspdioptera buscki as a new species and *Pterellipsis araence* as a new genus and species from Puerto Rico.

1900. Report on a collection of dipterous insects from Porto Rico. Proc. U. S. Nat. Mus. Vol. **22**(1198): 249–270.

117 species in 79 genera are mentioned, of which 16 species and 3 genera are described as new.

1902. New acalyptrate Diptera from North America. Jour. N. Y. Ent. Soc. **10**(4): 190.

Agromyza viridula as a new species from Puerto Rico.

Cotton, R. T. 1917 *a*. The eggplant lace-bug in Puerto Rico. *Corythaica monacha* Stal. Jour. Dept. Agr. P. R. **1**(3): 170–173.

Complete account of life-history, description of stages, natural enemies and control.

1917 *b*. Life history of *Haltica jamaicensis* Fabr. Jour. Dept. Agr. P. R. **1**(3): 173–175.

1917 *c*. Scale feeding habits of a Porto Rican millipede: *Rhinocricus arboreus* Saussure. Jour. Dept. Agr. P. R. **1**(3): 175–176.

A note on the considerable quantity of *Lepidosaphes beckii* consumed by this millipede.

1917 *d*. Las queresas y cómo combatirlos. Est. Exp. Asoc. Prod. Azúcar P. R. Circ. **9**: 1–7. Also in English as Circ. 9, Bd. Comm. Agr. P. R. Exp. Sta., 7 pp.

A popular article on the control of the more important scale insects.

1917 *e*. Report of the Assistant Entomologist. Ann. Rept. Ins. Exp. Sta. P. R. from 1st July to 30th June, 1917, pp. 106–122, 1 pl. 1 fig.

Notes on insects affecting tobacco, citrus and vegetables, and directions for making oil emulsion for citrus.

1918 *a*. Insectos que atacan las hortalizas en Puerto Rico. Rev. Agr. P. R. **1**(3): 119–131, 150–165, 198–212, 253–268.

This is a Spanish translation of Cotton 1918 c.

1918 *b*. Experimental work on the control of the white grubs of Porto Rico. Jour. Dept. Agr. P. R. **2**(1): 1–18.

1918 *c*. Insects attacking vegetables in Porto Rico. **Jour.** Dept. Agr. P. R. **2**(4) : 265–317.

The most complete account to date.

1918 *d*. Medios para combatir los gusanos blancos. Est. **Exp.** Asoc. Prod. Azúcar P. R. Circ. **12** : 1–7.

Control measures for white grubs in Puerto Rico.

1922. Broad-nosed grain weevil. U. S. Dept. Agr. Bul. **1085** : 1–10, 1 pl.

Caulophilus latinasus Say mentioned as known to occur in **Puerto** Rico.

* **Cox, O. H., Carrión, A. L., & Fox, C.** 1928. Rat-flea **survey** of the port of San Juan, Porto Rico—a preliminary **report.** Pub. Health Rept. **43**(11) : 611-616, 2 charts. (Abs. in Rev. Appl. Ent. B **16** : 163–164.)

Results of the survey made 1926–1927 and the species of fleas **found** and their comparative abundance.

Crawford, J. C. 1913. Descriptions of new **Hymenoptera.** Proc. U. S. Nat. Mus. Vol. **45**(6) : 244.

Ganaspis hookeri as a new species parasitic on *Anastrepha fraterculus* in Puerto Rico.

Crawley, J. T., Johnson, J. R., and **Van Dine, D. L.** 1911. **Organización** de la estación y cultivo de la caña de azúcar **en** Puerto Rico. Insectos de la caña y enfermedades de **la caña.** Est. Exp. de Cañas de la Asoc. Prod. Azúcar P. R., **49 pp.** Progress Pub. Co., San Juan.

Crespo, M. A. 1919. El comején (Termes sp.). Rev. **Agr. P.** R. **3**(6) : 35–38, 2 figs.

Brief general account with control measures.

1920. Un insecto muy dañino a las palmitas del coco. **El** escarabajo rinocerante (*Strategus quadrifoveatus*). Rev. Agr. P. R. **4**(3) : 47–48. (Abstracted in L'Agric. Colon., **Florence,** **14**(7) : 314–315, July 1920 under the title "Un insetto **molto** dannoso al cocco in Portorico," according to Rev. Appl. **Ent.** **8** : 451.)

Brief general account with control.

Crespo, M. A. and **Catoni, L. A.** 1920. **Restricciones legales al** comercio de plantas en Puerto Rico. Est. Exp. Ins. **Circ. 27** : 1–18.

Cresson, E. T. 1878. Descriptions of North American bees. Proc. Acad. Nat. Sci. Phila., 1875, pp. 188 and 208.

Anthophora krugii and *Melissodes trifasciata* as new species from Puerto Rico.

Cresson Jr., E. T. 1930. Notes and descriptions of some neotropical Neriidae and Micropezidae. Trans. Am. Ent. Soc. **56** : 350.

Taeniaptera (=*Calobata*) *lasciva* Fab. recorded from several localities in Puerto Rico.

Crossman, S. S. and **Wolcott, G. N.** 1915. Cómo dominar la changa. Est. Exp. Asoc. Prod. Azúcar P. R. Circ. **6** : 1–5. Also an English Edition.

Control measures for the changa or West Indian mole cricket.

Cuevas Zequeira, L. 1925. Apicultura. Rev. Agr. P. R. **15**(5) : 229–230. Notes on beekeeping in Puerto Rico.

Curran, C. H. 1926. New Diptera from the West Indes. Am. Mus. Novitates No. 220, 14 pp., June 19.

25 new species in 4 families described from Puerto Rico.

1927 *a*. New neotropical and oriental Diptera in the American Museum of Natural History. Am. Mus. Novitates No. 245, 9 pp.

5 new species in 3 families described from Puerto Rico.

1927 *b*. New West Indian Tachinidae. Am. Mus. Novitates No. 260, 15 pp., March 19.

4 new genera and 13 new species described from Puerto Rico.

1928. Insects of Porto Rico and the Virgin Islands. Diptera or two-winged flies. N. Y. Acad. Sci. Surv. P. R. and Virgin Ids. **11**(1) : 1–118, 39 figs.

Records about 275 species from Puerto Rico, of which 16 are described as new; 1 new genus; a list is appended of species previously listed from Puerto Rico but not seen by the author.

1930. New species of Diptera belonging to the genus *Baccha* Fabricius (Syrphidae). Am. Mus. Novitates No. 403, 14 pp., February 28.

Baccha deceptor as a new species from Puerto Rico, St. Thomas and St. Croix.

1931 *a*. First supplement to the Diptera of Puerto Rico and

the Virgin Islands. Am. Mus. Novitates No. 456, 23 pp., 4 figs.

1 new genus and 9 new species included in a number of additions to the list for the Island.

1931 *b*. New species of *Chrysopilus* from the neotropical region (Rhagionidae, Diptera). Am. Mus. Novitates No. 462, pp. 4 and 7, March 17.

Chrysopilus macularis and *C. leonardi* as new species from Puerto Rico.

Danforth, R. E. 1924. Notes on the life history of *Disonycha laevigata* Jacoby in Porto Rico. Jour. Econ. Ent. **17**(3) : 415–416.

The duration and description of the stages are given for the first time.

Danforth, S. T. 1926. Birds of the Cartagena Lagoon, Porto Rico. Jour. Dept. Agr. P. R. **10**(1) : 1–136, 45 figs.

Contains many observations on insects eaten.

1928. El departamento de zoología y entomología [del Colegio de Agricultura e Ingeniería de la Universidad de Puerto Rico]. Rev Agr. P. R. **20**(5) : 230 and 245, 1 fig.

Brief account of the plan of instruction in zoology and entomology.

1929. Entomology. Agr. Ext. Leaflet 4, Col. Agr. and Eng. Univ. P. R., 11 pp.

Brief general statement of the subject, with special reference to Puerto Rico.

Davis, Wm. T. 1928. The Cicadas of Puerto Rico with a description of a new genus and species. Jour. N. Y. Ent. Soc. **36** : 29–33, 2 figs. and 1 pl.

Proarna hilaris Germar discussed and *Borencona aguadilla* described as a new genus and species.

Dewitz, H. 1877 *a*. Tagschmetterlinge von Portorico, gesammelt von Herrn Consul Krug. Stett. Ent. Zeit. **38** : 233–245, 1 pl.

The earliest paper on Puerto Rican butterflies, with descriptions of new species and varieties.

1877 *b*. Dämmerungs—und Natchtfalter von Portorico, gesammelt von Herrn Consul Krug. Mitteilungen des Münchner Ent. Vereins 1 : 91–96, pl. 1.

3 new species described from Puerto Rico (Lepidoptera).

1881. Hymenopteren von Portorico. Berl. Ent. Zeit. **25** (pt. 2) : 197–208, 1 pl., 12 figs.

11 new species.

Dexter, Raquel R. 1932. The food habits of the imported toad, *Bufo marinus*, in the sugar cane sections of Porto Rico. Proc. Fourth Congress Int. Soc. Sugar Cane Technologists, (Preprint Bul. 74 : 1–5), San Juan.

A detailed study of the stomach contents of 301 specimens including identifications of most of the insects found.

Díaz, M. A. 1925. Resultados de la demonstración número 33. Exterminio de hormigas. Rev. Agr. P. R. **14**(1) : 38–39.

A brief record of the results obtained in a demonstration in the control of ants in a tobacco seed-bed.

Dikmans, G. 1927 *a*. Report of the parasitologist. P. R. (Mayagüez) Agr. Exp. Sta. for 1925, 22–24.

The horn fly taken on animals from the dry section and larvae of *Hypoderma* found in imported cattle.

1927 *b*. Report of the parasitologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1926, pp. 30–31.

Note on baby chicks infested with the sticktight flea, *Echidnophaga gallinacea*, and notes on lice on cattle and goats.

1929. Report of the parasitologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1927, pp. 27–28.

Several external parasites of domestic animals and poultry recorded.

Dodd, A. P. 1914. A new Proctotrypoid egg parasite from the West Indes. (Hym.). Ent. News **25** : 350.

Phanurus flavus from the eggs of *Ormenis pygmaea* Fab. from Puerto Rico.

Dohrn, Anton. 1860. Beiträge zu einer monographischen Bearbeitung der Familie der Emesina (part 2). Linn. Ent. **4** : 226–227.

Emesa varicornis and *Westermannia tenerrima* as new from Puerto Rico.

1863. Same title as above (part 2). Linn. Ent. **5** : 226–227.

Westermannia tenerrima Dohrn redescribed at greater length from Puerto Rico.

Dozier, H. L. 1925. An outbreak of the red-striped sugar-cane scale. Jour. Dept. Agr. P. R. **9**(4) : 357–367, 4 figs.

Description of the various stages and notes on the parasites; *Cheiloneurus pulvinariae* is described as a new species, hyperparasite on *Aphycus flavus* How.

1926 *a*. Some new Porto Rican scale parasites (Hymenoptera, Encyrtidae). Proc. Wash. Ent. Soc. **28**(5) : 97–102, 4 figs.

Merceticlla reticulata as a new genus and species and *Euaphycus portoricensis*, new species from *Asterolecanium pustulans* and *Acerophagas nubilipennis*, new species, from *Pseudococcus adonidum* and *P. citri*.

1926 *b*. Some new and interesting Porto Rican leafhoppers. Jour. Dept. Agr. P. R. **10**(3 and 4) : 259–265 (Date of publication, Sept. 1927).

Seven species described of which 3 are new.

1926 *c*. Notes on Porto Rican scale parasites. Jour. Dept. Agr. P. R. **10**(3 and 4) : 267–277.

Thirteen species treated of which 2 are new, the remainder mostly redescribed.

1926 *d*. Notes on Porto Rican Thysanoptera. Jour. Dept. Agr. P. R. **10**(3 and 4) : 279–281.

Locality and food-plant notes on 9 species, of which apparently 5 had not before been recorded from Puerto Rico—*Franklinothrips vespiformis* Cwfd., *Aleurodothrips fascipennis* Fkln., *F. tritici* Fitch, *Haplothrips merrilli* Watson and *Hoplandrothrips reynei* Priesner.

1926 *e*. Annual report of the division of entomology. Ann. Rept. Ins. Exp. Sta. P. R. for 1924–1925, pp. 115–124.

Notes on the status of various injurious insects.

1927 *a*. An undescribed white fly attacking citrus in Puerto Rico. Jour. Agr. Res. **34**(9) : 853–855, 3 figs.

Describes all stages of *Paraleurodes naranje* and records 61.2% of the pupae as parasitized by *Encarsia variegata* How.

1927 *b*. A new Fulgorid from Puerto Rico. Jour. N. Y. Ent. Soc. **35**(1) : 53–54, 2 figs.

Rhynchopterx salina from Guánica, Feb., 1925, on *Batis maritima*, "Lirio de mar."

1931. New and interesting West Indian Homoptera. Am. Mus. Novitates No. 510, 24 pp., 18 figs.

New species from Puerto Rico: *Nessorhinus graciloides* (Membracidae); *Thionia borinquensis, Colpoptera maculata, Neocolpoptera* (new genus) *portoricensis* and *N. monticolens* (Fulgoridae).

1932 *a*. Descriptions of new Trichogrammatid (Hymenoptera) egg-parasites from the West Indes. Proc. Ent. Soc. Wash. **34**(3) : 36–37.

Ufens osborni from the eggs of *Diaprepes spengleri abbreviatus* L. from Aguirre, P. R.

1932 *b*. The identity of certain whitefly parasites of the genus Eretmocerus Hald., with descriptions of new species (Hymenoptera: Aphelininae). Proc. Ent. Soc. Wash. **34**(7) : 112–118, 1 fig.

E. portoricensis as a n. sp. from *Aleurothrixus flocossus* Maskell at Bayamón and Central Aguirre, P. R. in 1925. Stated that this is the species erroneously determined for the writer as *E. californicus* and recorded as an efficient parasite of the woolly whitefly in Ins. Exp. Sta. Circ. P. R. 88:14, 1925.

1932 *c*. Two undescribed chalcid parasites of the woolly whitefly, Aleurothrixus floccosus (Maskell), from Haiti. Proc. Ent. Soc. Wash. **34**(7) : 118–122.

Euderomphale aleurothrixi n. sp. from many males and females from Haiti; a single female from the same host at Central Aguirre, P. R., is thot to be undoubtedly the same species altho the general color is a shade deeper.

Drake, C. J. 1918. Two new Tingids from the West Indies (Hem.—Heter.). Ohio Jour Sci. **18**(5) : 174–175.

Leptodictya bambusae from Puerto Rico.

Dyar, H. G. 1907. Descriptions of some American mosquitoes. Jour. N. Y. Ent. Soc. **15** : 13.

Culex toweri Dyar & Knab is described as new from P. R. (=*Culex secutor* Theobald).

1922. New American moths and notes (Lepidoptera). Ins. Insc. Men. **10**(1–3) : 10–11.

Agripodes jucundella (Noctuidae) from Puerto Rico.

1924. The male of Anopheles vestipennis Dyar & Knab (Diptera, Culicidae). Ins. Insc. Men. **12**(10) : 171.

Described from Puerto Rico.

1928. The mosquitoes of the Americas. Carnegie Institute Pub. No. 387, 616 pp., 418 figs.

All species known to occur in Puerto Rico to date are redescribed.

Earle, F. S. 1920. The cultivation of citrus fruits in Porto Rico. Ins. Exp. Sta. Circ. **26**: 16–17.

Brief discussion of insect pests.

1928. Sugar-Cane and Its Culture (Chapt. 6 "Insect and Other Pests of Sugar-Cane" pp. 162–188, refs. 22.) pp. 355, fig. 24, John Wiley and Sons, New York.

Earle, W. C. 1925 *a*. Malaria surveys in Porto Rico. **P. R.** Health Rev. 1(4) : 12–18, October.

In part this is a brief report on the malaria survey made 1919; it is stated that "*Anopheles albimanus* would easily appear to be the most important vector, altho at certain seasons *Anopheles grabhami* and *vestitipennis* are quite abundant.

1925 *b*. The relation of irrigation on cane fields to the malaria problem. Agr. Notes P. R. (Mayagüez) Agr. Exp. Sta., Office of Farm Management, No. 21, 3 pp., 1 diagram.

Incidence of malaria, breeding places for Anopheline mosquitoes and management of irrigation ditches discussed.

*1926. Cane field irrigation and malaria. Sugar (Review) **28**: 384, New York, August.

Listed in Pedreira's Bibliographia Puertorriqueña, p. 115, but I have been unable to consult a copy of this volume of Sugar to ascertain its exact contents.

1930. Malaria in Porto Rico. Am. Jour. Trop. Med. **10(3)**: 207–230, 8 refs.

A good account of the situation; the 3 species of *Plasmodium* and the 3 species of *Anopheles—albimanus, grabhami, vestitipennis* discussed in relation to the disease.

1932. Notes on the life-history of *Anopheles albimanus* and *grabhami*. P. R. Jour. Pub. Health and Trop. Med. **7**: 381–384.

1933. Some observations of antimosquito screening and screening materials. To be published in the March number of the P. R. Jour. Publ. Health & Trop. Med., Vol. 8

Earle, W. C. and **Arbona, Antonio.** 1930. La malaria en Puerto Rico. Oportunidad que se ofrece a los cañeros como de las mayores entidades que pueden coadyudar a su restricción. Rev. Agr. P. R. **24**(12) : 235–239.

A general discussion of work both done and to be done in an effort to reduce malaria, especially in the South Coast sugar growing sections, by means of proper location of workers' colonies, drainage, etc., in order to reduce the possibilities of transmission by mosquitoes.

Erichson, G. F. 1839–1840. Genera et species Staphylinorum insectorum coleopterorum familae, pp. 79–910.

Included within the range of the above cited pages are 26 species distributed in 19 genera described as new from Puerto Rico.

Erichson, G. F. in Germar, E. F. 1843. Versuch einer systematischen Eintheilung der Nitidularien. Zeit. für die Ent. **14**: 245.

Colastus infimus Er. as a new species from N. Am., Puerto Rico and Brazil (=*Colopterus truncatus* Randall).

Fauvel, Albert. 1895. Notes synonymiques. Rev. d'Ent., **14**: 106.

Olibrus parki var. *erithacus* Chevr. mentioned as occurring in Puerto Rico (as *Euxestus erithacus*).

Faxon, Richard and **Trotter, C. P.** 1932. Plant quarantine service in Porto Rico. Jour. Econ. Ent. **25**(3) : 435–447.

A detailed historical account with notes on the principal insects quarantined against and on the more important species injurious to several of the leading crops.

Felt, E. P. 1913. Three new gall midges (Diptera). Can. Ent. **45**(9) : 304–305.

Karschomyia cocci and *Mycodiplosis insularis* described from Puerto Rico.

1914. Arthrocnodax constricta n. sp. Jour. Econ. Ent. **7** (6) : 481.

Reared from garden beans & probably predaceous on *Tetranychus bimaculatus*, T. H. Jones Coll., Río Piedras.

1932. A new cambium miner of citrus in Puerto Rico. Jour. Dept. Agr. P. R. **16**(2) : 117–118.

Asynapta citrinae reared by G. N. Wolcott at Isabela, 1931.

Fernald, Mrs. M. E. 1903. A catalogue of the Coccidae of the world, Amherst, Mass., pp. 259–260.

Aspidiotus forbesi listed as occurring in Puerto Rico.

Fernández de Oviedo, Gonzalo. 1535. Historia general y natural de las Indias.

Fifty volumes published of which Book 16 and some chapters of others relate to Puerto Rico; included in the Biblioteca Histórica de Puerto Rico by Tapia, which see.

Ferris, G. F. 1922. Notes on Coccidae IX. Can. Ent. **54**(7): 160–161, fig. 4.

Cryptostigma (*Pseudophillipia*) *inquilina* on *Inga laurina* described from Puerto Rico as *C. ingae* new species.

[de la Ferté-Senectere, M. F. 1848. Monographie des Anthicus et genres voisins. coléopteres hetéromeres de la tribu des Trachélides. p. 157. Paris.

Wolcott on p. 85 of his "List" states that the type of *Anthicus vicinus* is given as " 'America borealis' from Puerto Rico" but an examination of the original description does not show any mention of Puerto Rico or any such definite locality.]

Figueroa, C. A. 1924. Demonstraciones Agrícolas. P. R. Dept. Agr. y Trab., Div. Fomento Circ. 3, pp. 1–65, several figs.

Notes on demonstrations in the control of the sweet potato weevil, *Cylas formicarius*, pp. 20–25, on tobacco insects, pp. 26–28, 30 on the changa, *Scapteriscus vicinus*, p. 29, on onions and on tobacco, p. 31, and on insects affecting stored seeds, pp. 32–36.

1926 *a*. Demostraciones agrícolas, 1924–25. Represión de enfermedades y plagas. Dept. Agr. y Trab. P. R. Circ. de Fomento No. 7: 107–138.

This chapter outlines methods and results of a number of demonstrations in the practical control by the official Agricultural Agents of a number of the more important crop pests in the Island.

1926 *b*. Algunos problemas agrícolas de Puerto Rico y sus soluciones. P. R. Dept. Agr. y Trab., Div. Fomento, Circ. 8, pp. 1–32, several plates.

Notes on demonstrations on the control of the sweet potato weevil, *Cylas formicarius*, the banana root-weevil. *Cosmopolites sordidus*, and the cattle tick.

Fischer, von W. G. 1888. Drei neue Anthonomus. Berl. Ent. Zeitschr. **32**(2): 487–489.

Anthonomus krugii, *A. nigrovariegatus* and *A. annulipes* described from Puerto Rico.

Fisher, W. S. 1918. Chrysobothris tranquibaricus Gmel. versus impressa Fabr. (Coleoptera, Buprestidae). Proc. Ent. Soc. Wash. **20**(8): 174 and 176.

Chrysobothris fraterna Mann described from Puerto Rico in Bul. Soc. Imp. Moscou 10(8): 75–76, 1837 is listed as a synonym.

1925 *a*. A revision of the West Indian Coleoptera of the family Buprestidae. Proc. U. S. Nat. Mus. Vol. **65**, Art. 9(2522): 1–207.

Acmaeodera gundlachi, p. 45, *Chrysobothris wolcotti*, p. 119, and *Taphrocerus elegans*, p. 187 described as new species from Puerto Rico.

1925 *b*. New West Indian Cerambycidae (Coleoptera). Subfamily Lamiinae. Am. Mus. Novitates No. **174**, 16 pp., May 28.

Leptostylus gundlachi and *L. antillarum* as new species from Puerto Rico.

1926. Descriptions of new West Indian longicorn beetles of the subfamily Lamiinae. Proc. U. S. Nat. Mus. Vol. 68, Art. 22(2623): 15–16.

Leptostylus longicornis as a new species from the Ins. Exp. Sta., Río Piedras, P. R.

1930 *a*. Notes on the rhinotraginae beetles of the family Cerambycidae, with descriptions of new species. Proc. U. S. Nat. Mus. Vol. 77, Art. 19(2842): 1–20.

Acyphoderes aurulenta Kirby recorded from Puerto Rico is probably the species recorded as *abdominalis* by Gahan and by Leng & Mutchler and mentioned in Wolcott's "List".

1930 *b*. New West Indian Buprestidae (Coleoptera). Proc. Wash. Ent. Soc. 32(7): 128–129.

Neotrackys hoffmani described from Puerto Rico.

1932. New West Indian Cerambycid beetles. Proc. U. S. Nat. Mus. 80 (Art. 22): 1–93.

Brittonella (new genus) *chardoni*, *Eburia portoricensis*, *Elaphidion portoricensis*, *Stizocera vanzwaluwenburgi*, *Tilloclytus minutus*, *Lamproclytus elegans* (new genus), and *Ecyrus nanus* and *E. flavus* described as new from Puerto Rico.

Fletiaux, Ed. 1897. Liste des Eucnemidae du musée de Berlin et description des espéces nouvelles. Ann. Soc. Ent. Belgique **41**: 256.

Arrhipis lanieri Guer. listed from Puerto Rico.

Folsom, J. W. 1923. A new Lepismid from Puerto Rico. Proc. Ent. Soc. Wash. **25**(7–8) : 169–170, pl. 14, figs. 1–8.

Ctenolepisma reducta.

1927. Insects of the Subclass Apterygota from Central America and the West Indies No. 2702. Proc. U. S. Nat. Mus. Vol. 72, art. 6, pp. 1–16 pl. 8.

Salina wolcotti and *Lepidocyrtus nigrosetosus* described.

Forbes, W. T. M. 1917. Notes on West Indian Syntomidae and Arctiidae (Lepidoptera). Bul. Am. Mus. Nat. Hist., Art. 14, **37** : 339–345.

Lymire senescens as a new species (= *L. flavicollis* DeW.) from Puerto Rico; *Eunomia columbina* (F.) recorded from Puerto Rico; variation in *Utetheisa ornatrix* L. is discussed.

1930. Insects of Porto Rico and the Virgin Islands. Heterocera or moths (excepting the Noctuidae, Geometridae and Pyralidae). N. Y. Acad. Sci. Surv. P. R. and the Virgin Ids. **12**(1) : 1–171, 2 pls.

One hundred seventy-four species are treated, mostly Puerto Rican, of which 6 new species and 1 new race are described from Puerto Rico; keys to the families, genera and species are given.

1931. Supplementary report on the Heterocera or moths of Puerto Rico. Jour. Dept. Agr. P. R. **15**(4) : 339–394, 6 pls.

Four new genera and 37 new species included. Also reprinted without change of title or pagination as a supplement to the preceding title.

1932. The rubidella group of Aristotelia. Jour. N. Y. Ent. Soc. **40**(4) : 423–433.

Aristotelia diolcella and *A. vagabundella* mentioned as having been described from Puerto Rico.

Forbes, W. T. M. and **Leonard, M. D.** 1930. A new leaf-miner of cotton in Porto Rico. Nepticula gossypii new species. Jour. Dept. Agr. P. R. **14**(3) : 151–157, 2 pls.

Distribution, life-history, description of stages, nature of injury and suggestions for control.

Frost, S. W. 1931. New species of West Indian Agromyzidae (Diptera). Ent. News **42** : 74–75.

Agromyza ipomeae described as a leaf-miner of sweet potato in Puerto Rico.

Funkhouser, W. D. 1930. New genera and species of neotropical Membracidae. Jour. N. Y. Ent. Soc. **38** : 413–414, pl. 23, fig. 12.

Spinodarnoides typus described as a new genus and species from Puerto Rico.

Gahan, A. B. 1915. Descriptions of new genera and species, with notes on parasitic Hymenoptera. Proc. U. S. Nat. Mus. **48** : 1–165.

Diaulinus insularis (Eulophidae) described from Puerto Rico as parasitic on *Agromyza inaequalis* Malloch.

1927. Miscellaneous descriptions of new parasitic Hymenoptera with some synonymical notes. Proc. U. S. Nat. Mus. **21** (Art. 4, No. 2676) : 1–39, 1 pl., 3 figs., 8 refs.

Prospaltella ciliata described as a new species from *Aleurodicus* sp. in Puerto Rico.

1930. Synonymical and descriptive notes on parasitic Hymenoptera. Proc. U. S. Nat. Mus. Vol. **77**(Art. 8, No. 2831) : 1–11.

Telenomus sphingis Ashm. reared from the eggs of *Phlegethontius sexta* Joh. by W. V. Tower at Gurabo, P. R., (previously determined by J. C. Crawford as *T. monilicornis*).

1932. Miscellaneous descriptions and notes on parasitic Hymenoptera. Ann. Ent. Soc. Am. **25**(4) : 736–757.

Apanteles laevigatus Asm. mentioned as occurring in Puerto Rico, p. 737 and *Grotiusomyia nigricans* How, recorded as received thru the P. Q. & C. A. bred from (*Lamprosema*) *Hedylepta indicata*, the bean leaf-webber, from Puerto Rico.

Gahan, C. J. 1895. On the longicorn Coleoptera of the West India Islands. Trans. Ent. Soc. London. pp. 79–140, 2 pls.

A number of Puerto Rican records including *Eburia bindosa* as a new species from Puerto Rico. This is possibly a synonym of *E. quadrimaculata* L.

Gerstaecher, Carl E. A. 1860. Die Arten der Gattung Lissomus Dalm. Linn. Ent. **14** : 169.

Drapetes chalybaeus described as a new species from Puerto Rico (as *Lissomus*).

Gibson, E. H. 1917. Two new species of Dicyphus from Porto Rico. Can. Ent. **49**(6) : 218–219.

D. prasinus and *D. luridus.*

Girault, A. A. 1916. Descriptions of miscellaneous chalcid-flies. Insec. Inscit. Men. **4**(11–12) : 111–113.

Eurytoma ctenodactylomyii and *Neocatolaccus livii* as new species from Puerto Rico.

Gómez, J. C. 1928. La vaquita de la caña. Rev. Agr. P. R. **20**(5) : 238 and 256.

Brief popular account of *Diaprepes spengleri* in Puerto Rico.

González, Manuel. 1924. Resultados obtenidos en una demonstración cuyo propósito fué controlar la changa y el gusano prieto del tabaco en una plantación. Rev. Agr. P. R. **13**(6) : 403.

González Ríos, Policarpo. 1920. Cultivo del banano en Puerto Rico. Est. Exp. Ins. P. R. Bol. **25**, 27.

Brief note on injury of *Phyllophaga* and *Diaprepes* injury to the banana in Puerto Rico; stated that insects are not very injurious.

1921. El cultivo del cocotero en Puerto Rico. Ins. Exp. Sta. P. R. Circ. **35** : 1–20. 4 figs.

The insect enemies of the coconut in Puerto Rico include the scales *Aspidiotus destructor* and *Vinsonia stellifera* and the rhinoceros beetle, *Strataegus quadrifoveatus;* brief account with control.

1922. El gorgojo de banano. Rev. Agr. P. R. **9**(6) : 39–42.

Brief popular account of the banana root-weevil, *Cosmopolites sordidus*, in Puerto Rico.

1923. El gusano del cogollo de la yuca. Rev. Agr. P. R. **10**(4) : 45–46.

Brief popular account of the cassava or yuca shoot-borer, *Lonchaea chalybea* Wied. in Puerto Rico.

1930. Cultivo del banano en Puerto Rico. Est. Exp. Ins. P. R. Bol. **36** : 47–51.

Brief discussion of the root-weevil and other insects attacking the banana in Puerto Rico with suggestions for control.

González Ríos, P. and **Mayoral Reinat, A.** 1931. El cultivo del aguacate en Puerto Rico. Est. Exp. Ins. P. R. Circ. **93** : 30–31.

Brief account of the more important insects affecting the avocado in Puerto Rico.

Gould, H. P. 1904. Indicaciones prácticas sobre el cultivo de frutas. Dept. Int. P. R., Neg. Agr. y Minas, Bol. Agr. **19**, pp. 5–22.

A Spanish translation of U. S. Farmers' Bul. 161 "Practical suggestions for fruit growers," 1902. This contains a discussion of spraying for the control of insects and diseases and descriptions of special uses of the various types of spray machines.

Gundlach, Juan. 1887, 1891 and 1894. Apuntes para la fauna Puerto-Riqueña. Ann. Soc. Espan. Hist. Nat. 16, 20 and 22. Part 8 of the whole deals with insects starting on p. 137 of Vol. **16** with the various orders as follows:
1887. Vol. **16** : 139–150, Orthoptera; 150–174; Hymenoptera; 174–199, Diptera.
1891. Vol. **20** : 323–384, Lepidoptera.
1894. Vol. **22** : 261–273, Neuroptera (incl. Odonata); 274–287, Hemiptera; 287–344, Coleoptera.

No new species are described but many scattered biological notes are included.

de Haan, Willem. 1842. Bijdragen tot de Kennis der Orthoptera. Verhand. de Natur. Gesch. der Nederl. Overzeesch. Bezitt. etc., Orthoptera, p. 102. Leiden.

According to Wolcott's "List" on p. 23 *Bacteria calamus* (Phasmidae) is described from Puerto Rico as a new species. I fail to find any mention of this species in this work. *B. spinosus* Burm. is, however, listed from Puerto Rico.

Hall, Maurice. 1929. Parásitos del ganado en América Latina. Rev. Agr. P. R. **22**(8) : 56 and (9) : 117.

A general account of the principal external and internal parasites of animals in Latin America, including control measures; several of of the more important insect pests such as cattle ticks, and the horn fly of cattle are briefly mentioned on p. 60 specifically as being troublesome in Puerto Rico.

Hampson, Geo. F. 1898–1920. Catalogue of the Lepidoptera Phalaenae in the British Museum. 13 Vols. and 2 Suppls.

The above are all that have been published to date and include the Syntomidae, Aretiidae, Agaristidae (only 1 species in Puerto Rico), and Noctuidae, (in part, about two-thirds). There are descriptions of many species specifically stated as ocurring in Puerto Rico.

Harris, H. M. 1928. A monographic study of the hemipterous family Nabidae as it occurs in North America. Ent. Am. **9** (N.S.) (1 and 2) : 77–78.

Carthasis gracilis Harris listed from Puerto Rico.

Hebard, Morgan. 1916. Studies in the group Ischnopterites.

(Orthoptera, Blattidae, Pseudomopinae). Trans. Am. Ent. Soc. **42**(4) : 367, pl. XVIII, figs. 14–17.

Symploce flagellata as a new species from Puerto Rico (Blattidae).

Henricksen, H. C. 1906 *a*. Vegetable growing in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Bul. **7**: 18–20, 2 figs.

A brief general account of insect pests: two classes of insects-biting and sucking affecting vegetables; the formulae for several of the standard insecticides are given and two types of small sprayers are suggested.

1906 *b*. Report of the horticulturalist. Insect pests. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1905, pp. 27–28.

Brief notes on several scales, June beetles, and ants with suggestions for control.

1930. Citrus culture in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Bull. **33**: 27–30.

A brief general account of the more important citrus insects and their control.

Henricksen, H. C. and **Iorns, M. J.** 1909. Pineapple growing in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Bul. **8**, p. 38.

The mealybug, *Pseudococcus brevipes* Ckll., and its attendant ant are mentioned; tobacco dust is recommended.

Hernández, Elías 1925. Represión del pulgón amarillo de la caña. Resultado de las demostraciones Nos. 12 y 13. (Contribución de la División de Fomento Agrícola). Rev. Agr. P. R. **14**(6) : 358–360.

Notes on a demonstration for the control of the yellow cane aphis, *Sipha flava*, with nicotine dust at San Germán.

Hernández, Elías and **Ramírez López, Carlos.** 1925. Represión de la oruga de la hoja del algodón. Demostración No. 3. (Contribución de la División de Fomento.) Rev. Agr. P. R. **14**(1) : 43–44.

Better results obtained in the control of the cotton leafworm by arsenate of lead dust than by spray.

Herrera, Antonio de. (1565–1625). Historia general de las Indias.

This work comprises 8 "decadas" the first to the fifth referring to Puerto Rico. Decada 2, libro 3, chapter 14, pp. 110–112, year 1518 refers to the ant plague in Hispaniola (Santo Domingo) and in San Juan, Puerto Rico, and the remedy therefore.

Hinds, W. E. 1903. El bisulfuro de carbono como insecticida. Dept. Interior. P. R. Neg. Agr. y Minas, Bol. Agr. **17**: 19–40. San Juan, November.

A translation of U. S. Farmers' Bul. 145, 1902 on "Carbon bisulfid as an insecticide.

Hoffman, Wm. A. 1925. A review of the species of Culicoides of North and Central America and the West Indies. Am. Jour. Hygiene **5**(3) · 285–289.

C. phlebotomus Will. and *C. furens* Poey recorded from Puerto Rico.

1927. A container for field collection of mosquito larvae. Science 66 : 484, 1 fig.

Description and diagram of the container.

1932. *Icerya purchasi* in Puerto Rico. Jour. Econ. Ent. **25** (3) : 726.

Brief note of its occurrence on casuarina (Australian pine) in San Juan proper.

Hoffman, W. A., Marín, R. A. & Burke, A. M. B. 1928. Filariasis in Porto Rico. P. R. Rev. Pub. Health & Trop. Med. **4**(3) : 120–127, 1 map. (Abs. in Rev. Appl. Ent. B **17**: 115).

Preliminary results of surveys in 31 localities; *Culex fatigans* found in all localities examined but scarcer in higher altitudes.

Holloway, T. E. 1915. Fighting the sugar-cane borer with parasites and poisons. Reprint from the Louisiana Planter and Sugar Manufacturer, December 18.

Reference is made to Wolcott's observation that borer infestation in Puerto Rico is inversely proportional to the amount of rainfall.

Holloway, T. E., Haley, W. E. and **Loftin, U. C.** 1928. The sugar-cane moth borer in the United States. U. S. Dept. Agr. Tech. Bul. **41**, 76 pp., 1 pl. and 25 figs.

Several references are made to *Diatraea saccharalis* Fab. in Puerto Rico.

Holloway, T. E. and **Loftin, U. C.** 1919. The sugar-cane moth borer. U. S. Dept. Agr. Bul. **746**, 74 pp., 9 pls., 12 figs.

On pp. 35–36 Wolcott's observations in Puerto Rico on rainfall and borer abundance are again referred to.

* **Holmer, E.** and **Little, L. L.** 1921. Porto Rico, beehive and orchard. Travel **36**: 22, January, New York.

Hood, J. D. 1913 *a*. Two new Thysanoptera from Porto Rico. Insec. Inscit. Men. **1**(6) : 65–70, 1 pl.

Heterothrips sericatus as a new species and *Podothrips semiflavus* as a new genus and species from Puerto Rico.

1913 *b*. On a collection of Thysanoptera from Porto Rico. Insec. Inscit. Men. **1**(12) : 149–154, 1 pl.

Dinurothrips hookeri as a new genus and species from Puerto Rico.

1914. Two Porto Rican Thysanoptera from sugar cane. Insec. Inscit. Men. **2**(3) : 38–41.

Heliothrips (?) *tibialis* as a new species and notes on *H. femoralis* Reuter. These are both in Wolcott's "List" on p. 239 under *Haplothrips*.

Hooker, C. W. 1912. The Ichneumon flies of America belonging to the tribe Aphioninae. Trans. Am. Ent. Soc. **38** : **144**, pl. II, fig. 13.

Eremotylus angulatus as a new species from Puerto Rico.

1913 *a*. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1912, pp. 34–38.

Notes on insect pests of coffee, mango, citrus and sugar cane and on apiculture; distribution of two Coccinellid beetles—*Cryptolaemus montrouzeri* from Río Piedras to Mayagüez and *Hippodamia convergens* introduced from California; also of the occurrence of the papya fruit fly, *Toxotrypana curvicauda* at Mayagüez.

1913 b. Entomological conferences in Porto Rico. Jour. Econ. Ent. **6** : 148–150.

A brief report on two conferences of the workers in entomology in Puerto Rico; an annotated list is given of the 9 papers read at the second conference, presented by as many individuals, which summarize the progress on several of the major projects under investigation.

Hottes, F. C. and **Frison, T. H.** 1931. The plant lice, or Aphiidae, of Illinois. Bol. Div. Nat. Hist. Surv. Ill. **19**, Art. 3, p. 174.

Sipha flava Fbs. stated as being frequently a serious pest of young sugar cane in Puerto Rico.

Howard, L. O. 1930. A history of applied entomology. (Somewhat Anecdotal). Smithsonian Misc. Coll. **84** (Whole Volume), Publ. 3065, pp. 457–460 and 523.

A brief resumé of applied entomology in Puerto Rico on pp. 457–460; on p. 523 are brief notes on parasite introductions.

Howard, L. O., Dyar, H. G. and **Knab, Fred.** 1912–1917. Mosquitoes of North and Central America and the West Indies. Carnegie Institute of Washington Publ. No. 159; **1** : 1–520, 1912; **2**, 150 pls. of 711 figs.; 1912; **3** : 1–523, 1915; **4** : 524–1064, 1917.

All the species, old and new, known to occur in the territory covered, including Puerto Rico, are herein described.

Hutson, J. C. 1917 *a*. Some weevils of the genus Diaprepes in the West Indies. Agr. News. Barbados, B. W. I. **61**(398) : 186.

Diaprepes doubleri, spengleri and *abbreviatus* listed as occurring in Puerto Rico.

1917 *b*. White grubs injuring sugar cane in Porto Rico. Agr. News, Barbados, B. W. I. **16**(397) : 218–219; (398) : 234; (399) : 250–251.

The paper by E. G. Smyth on white grubs injurious to cane in Puerto Rico in Jour. Dept. Agr. P. R. 1(2), 1917 is abstracted at some length.

1917 *c*. Sugar cane white grubs in Porto Rico. Agr. News, Barbados, B. W. I. **16**(404) : 330–331.

Abstract of the continuation of the above paper by Smyth in Jour. Dept. Agri. P. R. 1(3), 1917.

* **Iches, M. Lucien.** Date? La abeja doméstica. p. 368.

Colón, E. D. 1930, in foot-note No. 6 on page 158 says that it is here stated that the first bees imported into Puerto Rico and Cuba were *Apis mellifica* but that later there were imported into North America the Italian and Egyptian races.

* **Illiger, J. C. W.** 1807. Monographie der Elateren mit leuchtenden Flecken auf dem Halsschilde. Mag. Gesellschaft. Nat. Freund. Berlin 1, p. 149.

Pyrophorus luminosus described as a new species from Puerto Rico.

Jacoby, Martin. 1888. Biol. Centr. Am. Coleoptera, **6**, Pt. **1**, pp. 616–617.

Cerotoma ruficornis Oliv. listed from Puerto Rico.

Javiere, Clemente. 1932. Enfermedades y plagas que atacan al plátano. Bol. Agr. (P. R.) No. **30**, p. 3, March 5.

Brief note on injury and control of the banana root weevil, *Cosmopolites sordidus*.

Johnson, H. A. 1926. Occurrence of *Anopheles vestipennis* in Porto Rico. Am. Jour. Trop. Med. **6**(2) : 153–155.

First record of larva and adult male obtained during investigations in 1924–1925 with notes on seasonal abundance of the species.

Johnston, J. R. 1915. The entomogenous fungi of Porto Rico. Bd. Comm. Agr. P. R. Bul. **10**, 33 pp., 9 pls.

Descriptions of the species known to be present with notes on them and on the insects which they are known to parasitize in Puerto Rico.

Jones, T. H. 1913. Some notes on Laphygma frugiperda S. & A. in Puerto Rico. Jour. Econ. Ent. **6**(2) : 230–236.

1914. Additional notes on Porto Rican sugar-cane insects. Jour. Econ. Ent. **7**:(6)461–463.

Brief notes on determinations of specimens by various specialists and on synonomy of several species.

1915 *a*. Aphides or plant-lice attacking sugar-cane in Puerto Rico. Bd. Comm. Agr. P. R. Bul. **11**, 19 pp., 2 figs.

1915 *b*. La mariposa-barreno del tallo de la caña de azúcar (Diatraea saccharalis Fabr.). Junta de Com. Agr. P. R. Bol. **12**, 31 pp., 6 figs.

1915 *c*. The sugar-cane weevil root-borer (*Diaprepes spengleri* L.). Bd. Comm. Agr. P. R. Bul. **14**: 1–19, 11 figs.

1915 *d*. Insects affecting vegetable crops in Porto Rico. U. S. Dept. Agr. Bul. **192** (professional paper), 11 pp., 4 pls.

General account of more important species concerned with control measures.

1917 *a*. A list of the Coccidae of Porto Rico. Jour. Dept. Agr. P. R. **1**(1) : 1–16, 26 references.

Notes on the food-plants and distribution of 50 species are given.

1917 *b*. The sweet-potato leaf-folder. U. S. Dept. Agr. Bul. **609**: 1–12, 4 figs.

Pilocrocis tripunctata F. mentioned on p. 2 as injurious in Puerto Rico.

Jones, T. H. and **Wolcott, G. N.** 1922. The caterpillars which eat the leaves of sugar cane in Porto Rico. Jour. Dept. Agr. P. R. **6**(1) : 38–50, 10 figs.

Seven species of caterpillars do minor leaf-injury to sugar cane leaves, of which notes and original observations are given for six of these.

J. R. 1923. Destrucción de los insectos por medio del petróleo. Rev. Agr. P. R. **11**(4) : 19–21.

Brief general directions for the use of petroleum emulsions for the control of various groups of injurious insects.

Kellogg, Vernon L. 1905. American Insects, p. 161, fig. 230.

Mention made of the losses caused by the "changa" or Porto Rican mole cricket in Puerto Rico.

* **King, W. W.** 1917. The epidemic of dengue in Porto Rico, 1915. New Orleans Med. Surg. Jour. **49**(8) : 564–71. (Abs. in Rev. Appl. Ent. Ser. B. **65**: 61.)

Culex and Aedes, the common mosquitoes in San Juan, were especially numerous at the time of the epidemic.

* **Kinman, C. F.** 1918. The mango in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Bul. **24**: 1–30, 11 pls.

A thrips and the fruit-fly, *Anastrepha fraterculus*, stated to be the only insects of importance; recommends enclosing fruits in paper bags for the control of the latter. (Abs. in Rev. Appl. Ent. 6: 392).

Klots, A. B. 1929. A revision of the genus Eurema Hübner. Ent. Amer. **9**(3), n. ser., p. 132, fig.

E. portoricensis Dewitz mentioned as occurring only in Puerto Rico.

Klots, Elsie Broughton. 1932. Insects of Porto Rico and the Virgin Islands. Odonata or dragon flies. N. Y. Acad. Sci. Surv. P. R. and the Virgin Ids. **14**(1) : 1–107, 7 pls.

Thirty-eight species treated as occurring in Puerto Rico; none new.

Knab, Fred. 1915. Some West Indian Diptera. Insc. Inscit. Men. **3**(4) : 48–49.

Tabanus hookeri as a new species from Mayagüez, 1 male and 1 female, collected by Van Zwaluwenburg.

Koch, C. 1842. Die Arachniden, **9**: 66–67, pl. cccx, fig. 732, 83–84, pl. CCCXVII, fig. 744.

Mygale laeta, p. 66 and *Avicularia* (as *Mygale*) *caesia* as new species from Puerto Rico.

Kolbe, H. J. 1888. Die geographische verbreitung der Neuroptera und Pseudoneuroptera der Antillen nebst einer Übersicht über die von Herrn Consul Krug auf Portorrico gesammelten

Arten. Neuroptera v. d. Sammlung von Herr Krug. Archiv. für Naturgeschichte, 46th year, **1**(2) : 153–178, pl. 13, 11 figs.

An important paper on Puerto Rican Neuroptera.

1907. Ueber die Arten der Amerikanischen Dynastidengattung Strataegus. Berl. Ent. Zeit. **51**(1906) : 1–32, 1 pl., 8 figs.

S. quadrifoveatus on p. 21 and 32 and *S. titanus* on p. 31 listed from Puerto Rico..

1910. Ueber die Phileurinen Amerikas. An. Soc. Ent. Belgique **54** : 341.

Homophileurus quadrituberculatus P. de B. listed from Puerto Rico.

Kruger, Wilh. 1899. Das Zuckerrohr und seine Kultur mit besonderer Berücksichtigung der Verhaltnisse und Untersuchungen auf Java, p. 312.

In a foot-note *Delphax saccharivora* Westw. is listed from Puerto Rico.

* **Kudo, R.** 1930. Studies on Micosporidia parasitic in mosquitoes. viii. On a Miscosporidian, *Nosema aedis* nov. spec., parasitic in a larva of *Aedes argenteus* (*aegypti*) of Puerto Rico. Archiv. Protistenk. **49**(1) : 23–38, 2 pls., 47 refs. Jena, Jan. 15. (Notice by title in Rev. Appl. Ent. B 18 : 87).

Lacordaire, J. T. 1845. Monographie des coléopteres subpentameres de la famille des Phytophages, Vol. I. Mem. Soc. Roy. Sci. Liege **3** : 355–356.

Lema polita described as a new species from Puerto Rico.

Langston, J. M. 1923. The tobacco leaf-folder of Porto Rico attacks tomatoes in Mississippi. Qtly. Bul. State Plant Bd. Miss. **2**(4) : 7–9.

Notes on the discovery of *Pachyzancla periusalis* Wlk. in Miss. in Oct., 1922 and on its activities in Puerto Rico.

Lathy, P. I. 1899. Monograph of the genus *Calisto* Hübner. Trans. Ent. Soc. London, Part 2, pp. 221–228, pl. IV.

Calisto nubila described as a new species from Puerto Rico.

Ledru, Andrés Pedro. 1810. Viaje a la Isla de Puerto Rico en el año 1797. Paris. 2 Vols.

Forty-six species of insects listed from the Island. This is the earliest recorded collection of insects from Puerto Rico. Of those listed Wolcott indentifies 10 species in his "List" and states that the probable identity of many of the rest can be guessed.

* **Leefmans, S.** 1915. De cassave-oerets. [The cassava grubs]. Dept. Nijverheid, Landbow en Handel.—Med. van het Laboratorium voor Plantenzeikten, No. 13, 118 pp., 7 pls., 4 tables of curves. (Abstract in Rev. Appl. Ent. **4** : 82–84).

In the discussion of natural enemies reference is made to attempts which had been made to obtain beneficial parasites from Puerto Rico but which were unsuccessful.

Legrand, J. F. 1921. El gusano rosado del algodón (*Pectinophora gossypiella*). Rev. Agr. P. R. **7**(3) : 9–13.

Brief general account of the pink bollworm.

1923. Notas de interés. Entomología. Rev. Agr. P. R. **10**(4) : 49–50.

Notes on the sweet potato weevil and the cotton pink bollworm.

Leng, C. W. and **Mutchler, A. J.** 1914. A preliminary list of the Coleoptera of the West Indies as recorded to January **1**, 1914. Bul. Am. Mus. Nat. Hist. **33** (Art. 30) : 391–493.

Many species listed from Puerto Rico.

1916. Descriptive catalogue of West Indian Cicindelinae. Bul. Am. Mus. Nat. Hist. 35 (Art. 36) : 681–699, pl. 1, 5 figs.

Five species occurring in Puerto Rico treated; none new.

1917. Supplement to preliminary list of the Coleoptera of the West Indies. Bul. Am. Mus. Nat. Hist. **37** (Art. 5) : 191–220.

1922. The Lycidae, Lampyridae and Cantharidae (Telephoridae) of the West Indies. Bul. Am. Mus. Nat. Hist. **46** (Art. 8) : 413–499, 65 figs.

Seven species described as new from Puerto Rico.

Leonard, M. D. (See also under Forbes 1930, Mills 1931, and Pemberton 1932).

1930 *a*. An unrecorded food-habit of the large tobacco suck-fly in Porto Rico. Jour. Econ. Ent. **23**(3) : 640–641.

Brief note on injury to tobacco blossoms by *Dycphus luridus* Gibson.

1930 *b*. A little-known root-weevil of cassava (*Coelosternus sulcatulus* Boehman). Jour, Dept. Agr. P. R. **14**(3) : 159–165, 1 fig. and 3 pls.

Notes on injury and description of stages with a redescription of the adult of this rare weevil.

1930 *c*. Plagas de insectos de la cual está libre la caña en Puerto Rico. Rev. Agr. P. R. **25**(2) : 62–63, 93–94.

A summary of the distribution, life history, injury and control of several important sugar cane insects not as yet occurring in Puerto Rico.

1930 *d*. Recomendaciones para combatir las plagas que afectan en Puerto Rico al cultivo del algodón. El Mundo (San Juan), Oct. 14, pp. 3, 9, 11. Reprinted under the same title in Rev. Agr. P. R. **25**(4) : 135–136, 163–164. Also issued in mimeographed form by the Ins. Exp. Sta. as "Notas".

Suggestions for the control of the more important cotton insects in Puerto Rico.

1931 *a*. Entomology in Puerto Rico during the past decade. Jour. Econ. Ent. **24**(1) : 141–151.

1931 *b*. *Leptoglossus gonagra* Fab. injuring citrus in Porto Rico. Jour. Econ. Ent. **24**(3) : 765–767.

1931 *c*. A bibliography of the banana root weevil. Jour. Dept. Agr. P. R. **15**(2) : 147–176.

Two hundred fifteen titles, annotated, on the world literature of *Cosmopolites sordidus*.

1931 *d*. Report of the division of entomology for the fiscal year 1929–30. Ann. Rept. Ins. Exp. Sta. P. R. for 1929–30, pp. 110–123.

Notes on insects of sugar cane, the banana root weevil, a citrus insect survey proposed, on cotton insects and silk worm culture; a brief insect pest survey for the year is included and cooperation with the Scientific Survey of P. R. & the Virgin Ids. as well as other projects referred to.

1931 *e*. Insect conditions in Porto Rico during the fiscal year ended June 30, 1930. Insect Pest Surv. Bul. **11**(1) : 33–37.

1931 *f*. Insect conditions in Porto Rico during January and February, 1931. Ins. Pest Surv. Bul. **11**(2) : 76–78.]

1931 *g*. Insect conditions in Porto Rico during April 1931. Ins. Pest Sur. Bul. **11**(4) : 235–238, June 1.

1931 *h*. Insect conditions in Porto Rico during May, 1931. Ins. Pest Surv. Bul. **11**(5) : 317–319, July 1.

1931 *i*. Insect conditions in Porto Rico during June, 1931. Ins. Pest Surv. Bul. **11**(6) : 409–412, August 1.

1931 *j*. Insect conditions in Porto Rico during July, 1931. Ins. Pest Surv. Bul. **11**(7) : 492–494, September 1.

1931 *k*. Insect conditions in Porto Rico during August, 1931. Ins. Pest Surv. Bul. **11**(8) : 574–577, October 1.

1931 *l*. Insect conditions in Porto Rico during September, 1931. Ins. Pest Surv. Bul. **11**(9) : 642–645.

1932 *a*. The initiation of an insect pest survey in Porto Rico. Jour. Dept. Agr. P. R. **16**(1) : 59–64.

1932 *b*. The pink bollworm of cotton in Porto Rico. Jour. Dept. Agr. P. R. **16**(1) : 65–73.

A rather detailed account of the present status of the insect.

1932 *c*. Additional references to the bean lacebug. Jour. Dept. Agr. P. R. **16**(1) : 75–76.

Additions to the bibliography in the paper in this Journal by Leonard and Mills, 1931.

1932 *d*. Insect conditions in Puerto Rico during the fiscal year July, 1931 thru June, 1932. Jour. Dept. Agr. P. R. **16**(2).

A number of species added to the list for the Island in various groups.

1932 *e*. Thrips injury to citrus and roses in Puerto Rico. Jour. Econ. Ent. **25**(4) : 934–935.

The first identification of the blossom thrips of citrus—*Frankliniella insularis* Frank., *F. cubensis* Hood and *F. difficilis* Hood are the species involved; the one attacking roses is *F. insularis*.

1932 *f*. An early quarantine in Puerto Rico. Jour. Econ. Ent. **25**(4) : 930–931.

Translation of a royal decree from Spain of August 10, 1815 against the entry of ants supposedly the bibijagua, *Atta insularis* Guer. into the Island.

1932 *g*. Notes from annual report on insect conditions in Porto Rico, July 1, 1930 thru June 30, 1931. Ins. Pest Surv. Bul. **11**(10) : 682–685, February 1.

1932 *h*. Insect conditions in Porto Rico, October 1, 1931 to January 31, 1932. Ins. Pest Surv. Bul. **12**(1) : 36–38, March 1.

1932 *i*. Insect conditions in Porto Rico during February and March, 1932. Ins. Pest Surv. Bul. **12**(3) : 121–123, May 1.

1932 *j*. Insect conditions in Puerto Rico during April and May, 1932. Ins. Pest Surv. Bul. **12**(4) : 185–186, June 1.

The title is in error since records for April only are included.

1932 *k*. Insect conditions in Puerto Rico from January 1 to June 30, 1932. Ins. Pest Surv. Bul. **12**(9) : 405–408.

Brief notes on the status of a number of more or less injurous species.

1932 *l*. The cottony cushion scale in Puerto Rico. Jour Econ. Ent. **25**(5) : 1103–1107.

A brief account of the discovery, spread, foodplants and control of *Icerya purchasi* Mask. in Puerto Rico. Natural enemies in the Island are also discussed, most important of which is the Phorid fly, *Syneura cocciphila* Coq.; the introduction of the Australian lady beetle, *Rodolia cardinalis* Muls., is especially noted.

1933 *a*. Notes on the giant toad, *Bufo marinus* L., in Puerto Rico. Jour. Econ. Ent. **26**(1) : 67–72.

General distribution, life-history and food-habits with special reference to Puerto Rico, and successful shipments of live toads to Honolulu from Puerto Rico are discussed.

1933 *b*. A Braconid parasite of a Coccinellid new to Puerto Rico. Jour. Econ. Ent. **26**(1) : 294.

Brief note on the occurrence of *Homotylus terminalis*, Say, heavily parasitizing pupae of *Cycloneda sanguinea* L. predaceous on the yellow cane aphis, *Sipha flava* Fbs.

1933 *c*. Notes on insect conditions in Puerto Rico for the fiscal year, July 1931 thru June 1932. In press for the April number Jour. Dept. Agr. P .R. 17(2).

Leonard, M. D. and **Mills, A. S.** 1931 *a*. A preliminary report on the lima bean pod-borer and other legume pod-borers in Porto Rico. Jour. Econ. Ent. **24**(2) : 466–473.

Notes on the distribution & food-plants of *Maruca testulalis* Geyer, *Etiella zinckenella* Treit., *Fundella cistipennis* Dyar and *Brachyacma palpigera* Wlsm. and on parasites of two of these; among 5 other borers noted *Ancylostomia stercorea* Zell, was new to the Island.

1931 *b*. Observations on the bean lace-bug in Porto Rico. Jour. Dept. Agr. P. R. **15**(3) : 309–323, 1 fig. 2 pls., July (September actual date of issue).

Distribution, economic importance, food-plants, description of stages and control of *Corythucha gossypii* Fab. with an annotated bibliography of 44 titles.

Leonard, M. D. and **Seín, Jr., F.** 1931. The papaya fruit fly in Puerto Rico. Jour. Econ. Ent. **24**: 331–332.

Results of a survey to determine the distribution of *Toxotrypana curvicauda* Gerst. in the Island.

1932. Observations on some factors which may affect the abundance of *Diatraea saccharalis* in Porto Rico. Proc. 4th Congress Int. Soc. Sugar Cane Techs., (Preprint Bul. No. **92**: 1–2), San Juan, P. R.

Léveillé, A. 1907. Études sur la famille des Temnochilides. Ann. Soc. Ent. France **76**: 401–402.

Temnochila portoricensis described as a new species from Puerto Rico.

Lewis, G. 1888. Biol. Cent. Am. Coleoptera. Histeridae. **2**(7) : 208.

Epierus antillarum Marseul listed as occurring in Puerto Rico.

Linnaeus, Carolus. 1767. Systema Naturae, Ed. 12, **1**: 807.

The original description of *Empyreuma pugione* (as *Sphinx*) from St. Thomas. Dr. W. T. M. Forbes believes that since this has not been recorded from St. Thomas for 150 years the type specimen probably really came from Puerto Rico as the species is well known there.

Loew, H. 1851. Beschreibung einiger neuen Tipularia terricola. Linnea, **5**: 396–397 and 401–402, pl. 2, figs. 9–12.

Geranomyia rufescens (as *Aporosa*) and *Toxorhina fragilis* as new species from Puerto Rico.

López Domínguez, F. A. 1920. La preparación de la disolución arsenical para el exterminio de la garrapata. Est. Exp. Ins. P. R. Circ. **24**, 12 pp.

Directions for the preparation of the arsenical dip for the eradication of the cattle tick.

1927. Informe anual del director de la estación experimental insular, Río Piedras, 1925–26, 62 pp.

Notes on cane grubs, including suggested parasite introduction and the importation of the toad, *Bufo marinus* L., from Jamaica for their control; the sugar cane root-caterpillar (incorrectly called *Sufetula grumalis* Schaus); the banana root-weevil and several citrus insects, including notes on *Anastrepha fraterculus* which it is stated does not infest citrus in Puerto Rico.

1932. La Estación Experimental Insular, sus labores y resul-

tados alcanzados. El Agricultor Puertorriqueño **12**(5) : 25–27 and 41–43, San Juan, March 15.

Brief account on p. 27 of the chief entomological accomplishments during the life of the Station.

López Tuero, Fernando. 1895. La caña de azúcar en Puerto Rico, su cultivo y enfermedad, Capítulo 4, enemigos de la caña y modo de combatirlos, pp. 63–74. Enfermedad de la caña de azúcar, pp. 105–123. Río Piedras, P. R.

Brief account of the injury and control of the more important sugar cane pests.

1896. Tratado de cultivos tropicales, pp. 1–272, 2nd ed., printed by the Boletín Mercantile in Puerto Rico.

A general treatise on various tropical crops in the discussion of several of which is included a section on diseases and insects as follows: p. 16, enemies of cotton, but no specific reference is made to Puerto Rico; pp. 87–88, coffee insects in Puerto Rico, including ants, June beetles and white grubs, the beetle known as the "encelado" or "cucarachón" and the Cossonus weevil which is undoubtedly *Lachnopus coffeae* Marshal, the changa, the "piojillo" and the "cochinilla blanca" and the "cochinilla oscura;" pp. 141–149, various sugar cane insects are discussed and control measures given for the most of them; p. 197, the grain weevil is mentioned as attacking corn, the kernels of which the larva eats out; pp. 205–206, the rhinoceros beetle is discussed as an enemy of coconuts; p. 232, white grub injury to bananas; pp. 251–252, discussion of several of the more important Antillean tobacco insects.

Luciano, José. 1922 *a*. Plagas de insectos dañinos al hogar y medios para combatirlos. Rev. Agr. P. R. **8**(1) : 27–36.

Notes on cockroaches, ants, houseflies, crickets, silver fish and cloth moths and their control.

1922 *b*. Datos sobre la campaña del gusano rosado de la cápsula del algodón. Rev. Agr. P. R. **8**(3) : 63–64.

Notes on the campaign against the cotton pink bollworm.

1927. La mosca mediterránea. El porqué debemos evitar la introducción de este insecto a nuestra isla. Rev. Agr. P. R. **18**(3) : 143–144.

Brief general account as a basis of pointing out the necessity for the protective quarantine of the U. S. and Puerto Rico.

Ludlow, C. S. 1905. Mosquito notes—No. 4. Can. Ent. **39**: 385–388.

Aedes (*Taeniorhynchus*) *portoricensis* described as a *Culex* on page 386 from San Juan, P. R.

Lutz, A. and **da Costa Lima, A.** 1918. Contribuição para estudo das Tripaneidas (Moscas de frutas) brazileiras. Mem. Inst. Oswaldo Cruz **10**(1) : 4–16, 2 pls.

In a general discussion of the Brazilian fruitflies or Trypetids is it stated that the most important species, *Anastrepha fraterculus* Weid., also occurs in Puerto Rico.

Lutz, F. E. 1915. List of Greater Antillean Spiders with notes on their distribution. Ann. N. Y. Acad. Sci. **26**: 71–148.

On pages 113–115 is a general account of the Puerto Rican spider fauna with a table showing the American distribution of Puerto Rican genera; P. R. records are scattered thru the paper.

Macquart, J. 1834. Histoire naturelle des insectes dipteres, 1, pp. 229 and 450.

Hermetia albitarsus Fab. described as a new species from Puerto Rico under the name *H. sexmaculata;* also *Psilopus portoricensis* as a new species from Puerto Rico.

1840. Dipteres exotiques nouveaux ou peu connus, 3, p. 121.

Brief description of *Psilopus portoricensis* Macq. In the "Supplement" to this work (1846) the male is recorded on p. 120.

Maklin, F. W. 1867. Monographie der Gattung Strongylium Kirby, Lacordaire und der damit zunachst verwandten Formen. Acta Soc. Sci. Fennicae **8**(1) : 265.

S. pulvinatum described as a new species from Puerto Rico.

Malloch, J. R. 1913 *a*. A revision of the species of Agromyza Fallen and Cerodontha Rondani, (Diptera). Ann. Ent. Soc. Am. **6**(3) : 324, 328.

Agromyza plumisita and *A. minima* described as new species from Puerto Rico.

1913 *b*. Descriptions of new species of American flies of the family Borboridae. Proc. U. S. Nat. Mus. **44**(1958) : 361–372.

Limosina lugubrina, L. rotundipennis and *L. niveipennis* as new species from Puerto Rico.

1913 *c*. The genera of flies of the subfamily Botanobiinae with hind tibial spur. Proc. U. S. Nat. Mus. **46**(2024) : 248–249.

Hippelates spicata as a new species from Puerto Rico.

1914. Description of a new species of Agromyza from Porto Rico. Proc. Wash. Ent. Soc. **16**(2) : 89–90, fig. 1.

Agromyza inaequalis as a new species from leaves of *Vigna repens* in Puerto Rico.

M. A. M. 1932. Sobre la mosca de las frutas. Bol. Agr. (Puerto Rico) **1**(29) : 3, February 27.

A brief note regarding *Anastrepha* in citrus.

Mann, Wm. M. 1920. Additions to the ant fauna of the West Indies and Central America. Bul. Am. Mus. Nat. Hist. 42, (Art. 8) : 428.

Solenopsis globularia F. Smith *desechoensis* described as a new variety from Desecheo Island, P. R.

1931. Entomology.—A new ant from Porto Rico. Jour. Wash. Acad. Sci. 21(17) : 440–441, 1 fig.

Cerapachys (*Syscia*) *seini* described as a new species from soil about roots of sugar cane.

Mari, Mariano. 1931. Cómo combatir las queresas. Rev. Agr. (P. R. Dept. Agr.) **1**(7) : 3–4.

Brief directions for the control of scale insects.

Marlatt, C. L. 1903. Insecticidas importantes. Instrucciones para su preparación y uso. Dept. Interior P. R. Neg. Agr. y Minas Bol. Agr. 18, pp. 5–39. San Juan, December.

A translation of U. S. Farmers' Bul. 127, pp. 1–45, 1903 on Important Insecticides, directions for their preparation and use.

1908. New species of Diaspine scale insects. U. S. Bur. Ent. Tech. Bul. **16**(pt. 2) : 26–27, pl. 7, fig. 2.

Leucaspis indica as a new species from Florida and Puerto Rico.

1920. Report of the federal horticultural board [1919–20]. U. S. Dept. Agr., 29 pp.

Reference is made to a quarantine issued against cotton and cotton seed from Puerto Rico on account of the existance of *Eriophyes gossypii* Bks. there.

1928. Report [1927–28] of the federal horticultural board. U. S. Dept. Agr. 42 pp.

Euscepes batatae Waterh. is listed as having been intercepted in sweet potatoes from Puerto Rico.

Márquez, Nelson & Lizardi, Oscar. 1926. Resultados obtenidos en la demostración número 90 sobre "represión del piche de la batata". Rev. Agr. P. R. **17**(5) : 17, November.

Result of a demonstration in the control of the sweet potato weevil, *Cylas formicarius* Fab.

Marseul, S. A. de 1854. Essai momographique sur la famille des Histérides. Ann. Soc. Ent. France, Ser. 3. **2** : 671–707.

Epierus antillarum as a new species from Cuba, Puerto Rico and Santo Domingo.

Marshall, Guy A. K. 1922. Some injurious neotropical weevils (Curculionidae). Bul. Ent. Res. **13**(1) : 59–78, pl. 2, fig. 4.

Five species and 1 new variety described from Puerto Rico.

Maskew, F. and **Strong, L. A.** 1920. Quarantine division. Reports September–December, 1920. Monthly Bul. Cal. Dept. Agr. **9**(12) : 721–725.

On p. 726 *Lepidosaphes beckii* is listed as intercepted from Puerto Rico on grapefruit in October and on p. 734 on orange in December.

1925. Root knot on sugar cane in Porto Rico. Phytopathology 15(9) : 559–563, 2 figs.

Symptoms and extent of injury are given and a suggestion for control.

Matz, Julius. 1920. Citrus and pineapple rots. Ins. Exp. Sta. P. R. Bul **24** : 12, 3 figs.

In discussing various rots it is stated that the puncturing of pineapples by mealybugs, *Pseudococcus bromeliae* (now identified as *P. brevipes*) is often responsible for the spread of disease.

May, D. W. 1906. Report on agricultural investigations in Porto Rico, 1905, pp. 1–21.

pp. 11–12, a note on control of cotton insects (*Alabama argillacea* bad during the year); p. 13, a note on *Heliothis obsoleta* on corn; pp. 21, a note on soaking cane seed in limewater for the control of Diatraea.

1910. Sugar cane in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Bul. **9** : 39. (Also a Spanish edition.)

The mole cricket and white grub are mentioned as injurious.

1926. Agricultural notes. P. R. (Mayagüez) Agr. Exp. Sta. Ext. Leaflet No. 26, 2 pp.

Includes a note regarding the introduction of the giant toad, *Bufo marinus* L., by the P. R. Agr. Exp. Sta. from Barbados in 1920; 60,

specimens brought in for the purpose of controlling such injurious insects as Lachnosterna spp., *Scapteriscus vicinus* and cockroaches.

1927. Germinating sugar cane. P. R. (Mayagüez) Agr. Exp. Sta. Notes No. 38, 2 pp., April 27.

Report on experiments in soaking sugar cane sets in various solutions for the control of insect pests, especially *Diatraea saccharalis* F.

1930. Report of the Director. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1929, p. 4, 1 fig.

Brief note on the effective establishment and wide distribution of the imported toad, *Bufo marinus* L., and its benefits in reducing the numbers of certain injurious insects. The introduction of the frog, *Leptodactylus pentadactylus* from Dominica, B.W.I., for the same purpose and also possibly for food is also mentioned.

McAtee, W. L. 1932. A new neotropical genus of Eupteryginae (Homoptera) from Puerto Rico. Jour. Dept. Agr. P. R. **16**(2): 119–120, 1 fig.

Hybla maculata described from mamey from Barceloneta and Pt. Cangrejos.

McClelland, T. B. 1931. The relation of the Porto Rico Agricultural Experiment Station (Mayagüez), P. R., to the agriculture of Porto Rico.—1904–1930. Agr. Notes of the P. R. Agr. Exp. Sta. No. 54, 3 pp. (Also published in the Porto Rico Progress, San Juan, P. R., shortly after.)

On p. 3 is a note regarding the introduction of the giant toad, *Bufo marinus* L., and its subsequent beneficial effect by its reduction of such insects as mole crickets, white grubs, ants and cockroaches.

McClelland, T. B. and **Tucker, C. M.** 1929. The green scale, *Coccus viridis*, a new pest in coffee and citrus. Agr. Notes of the P. R. (Mayagüez) Agr. Exp. Sta. No. 48, 2 pp. Also a Spanish edition.

Brief account of the very recent discovery of this scale in Puerto Rico, with general and local distribution and food-plants and control.

McKinley, Earl B. 1929. The salivary gland poison of *Aedes aegypti*. Proc. Soc. Exp. Biol. and Med. **26**: 806–809.

Results of attempts to immunize susceptible individuals to mosquito bites conducted in Puerto Rico.

Medina, Vicente. 1931. El control de enfermedades y plagas en los semilleros y viveros de café. Bol. Agr. (P. R. Dept. Agr.) **1**(7): 2–3.

Brief account, with control, of the coffee leaf-miner, *Leucoptera coffeella* Stainton.

Melander, A. L. 1927. Diptera. Empididae. Genera Insectorum, Fasc. 185, p. 32.

Euhybos spiniger as a new species from Utuado, P. R., Jan. 1899 (Aug. Busck) in U.S.N.M. Curran thinks this may be the same as his *E. spinosus*.

Menéndez Ramos, R. 1923. El pulgón amarillo de la caña. Rev. Agr. P. R. **11**(4): 23–27, 1 fig.

Brief general account of the damage and control of the yellow cane aphis, *Sipha flava* Fbs.

1924. El "*Melinitis minutiflora*" y la garrapata. Rev. Agr. P. R. **12**(4): 219–223, 2 figs.

Trials show that molasses grass does not destroy cattle ticks, *Boophilus* (*Margaropus*) *annulatus australis* Fuller, but repels them.

1926. Cómo hemos combatido el gusano agrimensor de la caña en Humacao. Rev. Agr. P. R. **16**(1): 9–11.

Merrill, Geo. B. 1915. Progress report on investigations relative to the horn-fly. Third Rept. Bd. Comm. Agr. P. R., 1913–1914, pp. 53–55.

A brief note on the introduction of predaceous beetles from Texas, Santo Domingo and Illinois.

1916. Report of the tobacco insect investigations. Fourth Rept. Bd. Comm. Agr. P. R., 1914–1915, pp. 50–52.

1923. Scale insects of Florida. Fla. State Plant Bd. Quart. Bul. 7(4): 177–298, figs. 16–116.

A number of the many species described and figured are mentioned as also occurring in Puerto Rico.

Mills, A. S. and **Leonard, M. D.** 1931. The eggs of the lima bean pod-borer in Porto Rico—Maruca testulalis Geyer (Lepid., Pyralidae). Jour. Econ. Ent. **24**(3): 763.

First note on the location and description of the eggs of this widely distributed species.

Molinary Sales, E. 1924. Demostración No. 8. Extirpación del gusano agrimensor (*Mocis remigia repanda*) que ataca las hojas de la caña. Rev. Agr. P. R. **13**(6): 385–387.

In the case of an infestation of sugar cane by this caterpillar dusting with arsenate of lead and lime is recommended.

Montgomery, J. H. and **Bragdon, K. E.** 1919. Quarantine Department. Qtrly. Bul. Fla. State Plant Bd. **3**(2) : 110–112.

Euscepes batatae is reported as having been intercepted in sweet potatoes received from Puerto Rico into Florida during the quarter ending December 31st, 1918.

* **Moore, E. L.** 1910. Insect pests and their extermination. The P. R. Hort. News, pp. 134, 143, 144, September. (Ref. from Pedreira.)

Discusses the changa or West Indian mole cricket.

More, J. D. 1921 *a*. La vaquita o piche de la batata. Est. Exp. Ins. P. R. Circ. **34**, 7 pp. 1 pl. colored.

Brief general account of the sweet potato weevil and its control in Puerto Rico.

1921 *b*. Las pulgas del tabaco. Est. Exp. Ins. Circ. **50**, 8 pp.

Brief general account of the tobacco flea-beetles in Puerto Rico and their control.

1921 *c*. Insectos predominantes durante el mes. Rev. Agr. P. R. **5**(7) : 33–36.

Notes on damage by and suggestions for control of the changa and the sweet potato weevil.

1921 *d*. Instrucciones concernientes al gusano rosado del algodón. Rev. Agr. P. R. **6**(5) : 21–26.

Notes concerning the life-history and habits of the cotton pink bollworm in Puerto Rico, for the information of cotton growers.

1923. Insects, fish and other fauna of Porto Rico. The Book of Porto Rico, pp. 54–64, several figs. San Juan.

A very brief account of the more important injurious insects of the Island in both Spanish and English.

Morgan, A. C. 1925. A new genus, a new subgenus and seven new species of Thysanoptera from Puerto Rico. Florida Entomologist **9**(1) : 1–9.

Cercyothrips striatus n. gen. and sp.; *Sericothrips portoricensis* and *Anaphothrips bicolor* n. spp.; *Lissothrips* (*Prolissothrips*) *stratulus* n. subgen and sp.; *Gastrothrips fuscicauda*, G. *anolis* and *Diceratothrips wolcotti* n. spp.

Morrison, Harold. 1932. On some trophobiotic Coccidae from British Guiana. Psyche **29**(4) : 145–148, pl. 6, figs. 20–31.

Akermes secretus new species from Puerto Rico [=*Cryptostigma* (*Pseudophillipia*) *inquilina* (Newstead) Ferris].

Möschler, H. B. 1890. Die Lepidopteren-Fauna der Insel Portorico. Abhandlungen Senkenbergischen Naturforschenden Gesellschaft **16**, Heft 1, pp. 69–360, 1 pl.

Catalog of the Lepidoptera of the Island based on the same material as Gundlach's paper; many new species are described.

Moser, J. 1918. Neue Arten der Gattungen *Lachnosterna* Hope und *Phytalus* Er. (Col.). Stett. Ent. Zeitg. **79** : 19–74.

Phyllophaga (*Lachnosterna*) *insulicola*, p. 61 and *P. portoricensis* (Chevrolat in lit.), p. 62 described as new species from Puerto Rico.

Muesebeck, C. F. W. 1921. A revision of the North American species of ichneumon-flies belonging to the genus Apanteles. Proc. U. S. Nat. Mus. **58**:(2349) : 558–559.

Apanteles prenidis new species from Pureto Rico reared from *Prenes ares* Felder.

Muir, F. 1918. Homoptera notes II. Proc. Hawaiian Ent. Soc. **3**(5) : 414–429.

Cyclokara sordidulum as a new species p. 416, and *Otiocerus schonherri* Stal p. 420, recorded from Puerto Rico (Derbidae); *Ugyops occidentalis* and *Punana puertoricensis*, p. 425 as new species and *Neomalaxa flava* as a new genus and species, p. 426 (*Delphacidae*) from Puerto Rico.

* 1922. Direct and indirect injury to plants by insects. Hawaiian Planters' record **2** : 65–66. (Abs. in Rev. Appl. Ent. **10** : 347.)

Sugar cane mosaic not so serious in Hawaii as in Puerto Rico due possibly to the presence in the latter place of insect vectors which carry the disease directly from unhealthy to healthy cane whereas in Hawaii it is carried by occasional visitors to the plants.

1924. New and little known Fulgorids from the West Indes (Homoptera). Proc. Hawaiian Ent. Soc. for 1923 **5**(3) : 461–472, pl. XII.

Ormenis pseudomarginata (Flattidae), p. 469–470; *Acanalonic brevifrons* (Acanaloniidae), p. 467; *Cubana tortriciformis* (Cixiidae), p. 461; *Cedusa wolcottii* (Derbidae), p. 462; *Dysimia* (new genus) *maculata* (Derbidae), pp. 462–464; *Parahydriena* (new genus) *hyalina* (Derbidae), pp. 464–465; *Colpoptera brunneus* (Issidae), pp. 465–466 and *C. maculifrons* (Issidae), p. 466, all as new species from Puerto Rico.

Muir, F. and **Gifford, W. M.** 1924. Studies in North American

Delphacidae. Hawaiian Sugar Planters' Exp. Sta. Bul. **15** (Ent. Ser., pp. 9, 17).

Neomalaxa flava Muir recorded as occurring in Puerto Rico and *Nilaparvata wolcotti* described by Muir as new species from Puerto Rico.

Mutchler, A. J. 1923 *a*. Notes on West Indian Lycidae and Lampyridae (Coleoptera) with descriptions of new forms. Am. Mus. Novitates No. 60, 13 pp., 1 fig. March 15.

Callopisma borencona as a new species from several localities (Lycidae) on p. 9 and *Pyractomena galeata* E. Oliver listed from Puerto Rico.

1932 *b*. Notes on West Indian Lampyridae and Cantharidae (Coleoptera) with descriptions of new forms. Am. Mus. Novitates No. 63, 9 pp., 1 fig., March 29.

Photinus heterodoxus L. & M., *P. dubiosus* L. & M., *P. vittatus* G. A. Oliv., and *Tytthonyx discolor* L. & M. listed from Puerto Rico with notes.

Myers, J. G. 1931 *a*. A preliminary report on an investigation into the biological control of West Indian insect pests. Empire Marketing Board 42: 53–54, 78, London.

Brief mention of the status of several of the more important insect pests of Puerto Rico.

1931 *b*. Descriptions and records of parasitic Hymenoptera from British Guiana and the West Indies. Bul. Ent. Res. **22**: 267–277, 3 figs.

Microdus stigmaterus Cress., p. 274, mentioned as having been artificially introduced into Puerto Rico by Box.

Nesbit, D. M. 1903. La batata. Dept. Int. P. R. Neg. Agr. y Minas Bol. Agr. 16, pp. 33–34.

Brief general account of the most important classes of insects injurious to the potato in this Spanish translation of U. S. Farmers' Bul. 129.

Nolla, J. A. B. 1924. Resultados de la demonstración No. 20 sobre el control de la changa en un semillero de cebollas. Rev. Agr. P. R. **12**(3).: 202.

1929 *a*. Acrostalagmus aphidum Oud. and aphid control. Jour. Dept. Agr. P. R. **13**(2) : 59–72.

Excellent results by spraying liquid cultures of this fungus in the

control of 7 determined species of commom aphids and 2 undetermined species in Puerto Rico.

1929 *b*. Un hongo parasitario de los áphidos. Rev. Agr. P. R. **23**(5) : 196–197.

Brief popular version of the above paper.

1929 *c*. El Acrostalagmus aphidum Oud. en la lucha contra los áfidos. Mem. Soc. Esp. Hist. Nat. **15**: 9–12, 1 fig., 1 pl.

Much the same information as in 1929 a.

Notman, Howard. 1929. New species of *Palaminus* from the West Indies, together with a synoptic review of the genus. Am. Mus. Novitates No. 386, 17 pp., November 27.

P. lengi, parvipennis, bifids, scitulus, pusillus, grandicollis, procerus as new species and *P. insularis* Cameron listed from Puerto Rico.

Ochs, Geo. 1924. On the West Indian Gyrinidae and a new species of Gyretes from Northern Brazil. Am. Mus. Novitates No. 125, 8 pp., July 24.

Dinutus carolinus LeConte, *D. mutchleri* as new species and *D. longimanus* (Oliv) *portoricensis* as new subspecies from Puerto Rico; *Gyrinus rugifer* Regimbart and *Dinutus metallicus* Aubé listed from Puerto Rico with notes.

[Olivier, A. G. 1790. Entomologie **2** No. 28. p. 23. pl. 3. fig. 20.

Photinus vittatus is described as a new species from Santo Domingo only. Wolcott in his "List" on p. 82 states that the types were from Puerto Rico also. The species is, however, widely distributed in Puerto Rico].

1807. Entomologie **5**, No. 83, p. 145.

Baris torquatus (as *Rhynchaenus*) and *R. militaris* (probably now in *Pseudonus*) as new species from Puerto Rico.

1808. Entomologie **6**, No. 93, pp. 635–636.

Galerucella obliterata as a new species from Puerto Rico.

Olivier, E. 1899. Revision des coléopteres Lampyrides des Antilles et description des espéces nouvelles. Bul. Soc. Ent. France **24**: 87–92.

Lecontea galeata (as *Pyractomena*) as a new species from Puerto Rico on p. 91.

1912. Contribution a la faune entomologique des Antilles.

Lampyrides. Rev. Sci. du Bourbonais et du centre de la France, **25**: 19 and 33.

Callopisma dimidiatipennis Oliv. p. 19 and *Photinus triangularis* Oliv. p. 33 listed from Puerto Rico.

1912 *b*. Lampyrides faisant partie des collections du musée de Washington. Ann. Soc. Ent. Belgique **56**: 25.

Photinus triangularis as a new species from Puerto Rico.

Osborn, Herbert. 1928. Neotropical Homoptera of the Carnegie Museum. Part 6. Report on the subfamily Typhlocybinae with descriptions of new species. Ann. Carnegie Mus. **18**(2): 253–298.

Protolebra bicincta, p. 259 and *P. pallida*, p. 260 as new species and *P. similis* Baker pp. 263–264 listed from Puerto Rico.

1929. Notes on Porto Rican Homoptera. Jour. Dept. Agr. P. R. **13**(3): 81–82.

Records a number of species mostly based upon a collecting trip to the Island during the winter of 1928–1929; 7 species of leafhoppers are described as new; general discussion of ecology and distribution.

Osten Sacken, C. R. 1887. Studies on Tipulidae, Part 2. Berl. Ent. Zeitschr. **31**: 184.

Rhamphidia albitarsus as a new species from Puerto Rico.

Osuna, Pedro. 1929. Medios para combatir los insectos en las hortalizas. Rev. Agr. P. R. **23**(2): 82 and 95.

Brief practical directions for the control of vegetable insects.

Pagenstecher, Arnold. 1907. Die Lepidopteren Fauna der Antillen. Jarb. Nassauische Ver. Naturbunde **60**: 91–92. Weisbaden.

On p. 97 is a brief geographical summary of Puerto Rican Lepidoptera with references to several of the more important papers on the subject.

Parker, R. R. 1914. Sarcophagidae of New England: males of the genera Ravinia and Boettcheria.

Sarcophaga quadrisetosa Coq. (as *Ravinia*) listed as occurring in Puerto Rico.

Pastor Rodríguez, Juan. 1929. El cultivo del algodón Sea Island. Rev. Agr. P. R. **22**(10): 157–158 and 172.

Notes on the injury and control of the more important insects of Sea Island cotton in Puerto Rico are included.

1931 *a*. Alarmante irrupción de la oruga rosada del algodón en el distrito sur. Rev. Agr. P. R. **26**(9): 174, 176.

Brief account of the outbreak of the pink bollworm of cotton during the previous season in the South coast of the Island.

1931 *b*. Alrededor de la oruga rosada (*P. gossypiella*). Bol. Agr. (P. R. Dept. Agr.) **1**(6): 2–3.

Brief account of the increased infestation of the pink bollworm in the south coast during the past season with a sketch of the life-history and outline of control measures.

1932. Porto Rico moves forward in cotton. Cotton Trade Journal, International Edition, 1932, pp. 91–93, 1 map, 3 figs., 2 tables. New Orleans, La.

On p. 93 is a brief discussion of the status of the more important insect pests in Puerto Rico—the pink bollworm and the cotton leafworm; the absence of the boll weevil is noted.

Altho this article bears no authorship it was written by Mr. Pastor Rodríguez.

Pedreira, Antonio S. 1932. Bibliografía Puertorriqueña (1493–1930). Monografías de la Universidad de Puerto Rico. Serie A. Estudios Hispánicos. Núm. 1. Madrid, XXXII 707 pp.

Contains about 200 references to articles on Puerto Rican entomology, about 175 of which are under the heading of "Entomología económica" and the remainder scattered thru several other sections.

Pemberton, C. E. and **Leonard, M. D.** 1932. Entomology at the Fourth Congress of the International Society of Sugar Cane Technologists in Porto Rico. Jour. Econ. Ent. **25**(3): 732–733. Also under same title in Ent. News **43**(7): 195–196.

Brief note giving names of entomologists in attendance and general subjects of papers presented at the Congress.

Pérez Torres, Manuel. 1922. Fiebre tejana. Rev. Agr. P. R. **22**(5): 220–221, 225, 1 fig.

A general discussion of Texas fever with brief directions for its control by ridding the cattle of ticks.

Pergande, T. and **Cockerell, T. D. A.** 1900. List of the Coccidae collected by Mr. A. Busck in Porto Rico, 1899. U. S. Dept. Agr. Div. Ent. Bul. **22**, New Series, pp. 92–93.

Twenty-three listed, with dates of collection and food-plants.

Petrunkevitch, Alex. 1911. A synoptic index-catalogue of spiders of North Central and South America with all adjacent

islands, Greenland, Bermuda, West Indies, Tierra del Fuego, Galápagos, etc. Bul. Am. Mus. Nat. Hist. **29**: 1809.

All spiders recorded to date from Puerto Rico are listed.

1926. Tarantula versus tarantula-hawk: a study in instinct. Jour. Exp. Zool. **45**(2): 367–393, 2 pls.

A contribution from the University of Puerto Rico in which the attack of the tarantula-hawk, *Pepsis marginata* P. de B. upon *Cyrtophilus portoricae* Chamb, under observation cage conditions at Río Piedras, P. R., is described in detail.

1929. The spiders of Porto Rico. Part One. Trans. Conn. Acad. Arts and Sci. **30**: 1–158, 150 figs.

1930 *a*. The spiders of Porto Rico. Part Two. Trans. Conn. Acad. Arts and Sci. **30**: 159–355, 240 figs.

1930 *b*. The spiders of Porto Rico. Part Three. Trans. Conn. Acad. Arts and Sci. **31**: 1–191, 168 figs.

One hundred seventy-four species are described in detail in the above 3 parts, 72 of which are described as new.

Phillips, E. F. 1914. Porto Rican beekeeping. P. R. (Mayagüez) Agr. Exp. Sta. Bul. **15**, 24 pp., 2 pls. Also a Spanish edition, 28 pp., 1915.

Pierce, W. Dwight. 1914. Descriptions of two new species of Strepsiptera parasitic on sugar cane insects. Proc. Ent. Wash. **16**(3): 126–129.

Stenocranophilus quadratus as a new genus and species reared from *Saccharosydne saccharivora* Westw. in Puerto Rico.

1915. Some sugar-cane root-boring weevils of the West Indes. Jour. Agr. Res. **4**(3): 255–264, 4 pls.

Description of and notes on *Diaprepes famelicus* (not in P. R.) Oliver and *D. spengleri* & its varieties, of which *D. s. spengleri, comma* and *abbreviatus* are stated to occur in Puerto Rico.

1917. A Manual of dangerous insects likely to be introduced into the United States through importations. U. S. Dept. Agr. Office of Sec'y. Contrib. from Bur. Ent. and Fed. Hort. Bd., Aug. 15.

An occasional specific reference to Puerto Rico.

1918. Weevils which affect Irish potato, sweet potato and yam. Jour. Agr. Res. **12**(9): 608, pl. 32, figs. C, D.

Records having specimens of *Euscepes batatae* from Mayagüez, P. R., which were injuring sweet potatoes.

Quaintance, A. L. 1900. Contributions toward a monograph of the American Aleurodidae. U. S. Bur. Ent. Tech. Bul. **8**: 43–47, pl. 6, figs., 63–67.

Aleurodicus (Metaleurodicus) minimus as a new species from Puerto Rico.

Quaintance, A. L. and **Baker, A. C.** 1915. Classification of the Aleyrodidae, Parts 1 and 2. U. S. Bur. Ent. Tech. Bul **27**: 1–114 pp., many pls. & figs.

I fail to find *Dialeurodes buseki* as a new species from Puerto Rico but *Aleurodicus minimus* Quain. is redescribed in the new subgenus *Metaleurodicus* on p. 77 and *Leonardius lahillei* Leonardi is redescribed on p. 33, both from Puerto Rico.

Quedenfeldt, G. 1886. Neue und seltnere Käfer von Portorico. Berl. Ent. Zeits. **30**(1): 119–128.

Ten new species and 1 new variety, including 1 new genus described from Puerto Rico.

Quintanilla, Guillermo. 1896. Enfermedad de los cafetales en Adjuntas, la plaga de la vaquita. La Reforma Agrícola (Organo de la Asociación de Agricultores de Puerto Rico), year 3, No. 12, pp. 217–224. November.

Records an inspection trip to Adjuntas in April 1895 to investigate an outbreak of a weevil on coffee, which according to local growers had been doing more or less damage there for 14 years; it is stated that the adult injures the leaves, green shoots, buds, flowers and fruit of the coffee trees; a sketchy description of some length is given of the adult and the author judges that it belongs to the genus Cossonus (he spells it Cossonns) of the Curculionidae; larvae and pupae were not found; it is suggested that the soil be put in better condition for coffee production and after sufficient experimentation that control measures should be used directly against the adult weevils; it is reported that growers had tried spraying with petroleum, fenic acid, and with hypochlorite of lime with very contradictory results.

Altho Quintanilla's description of the adult weevil is very general, neither length nor color even being mentioned, there seems little doubt that the insect under discussion is *Lachnopus coffeae* Marshall, or possibly of course var. *montanus Marshall*, both of which were not described until 1922. If so Quintanilla's is the earliest published account of the insect.

Rehn, James A. G. 1903 *a*. Notes on West Indian Orthoptera,

with a list of the species known from the Island of Porto Rico. Trans. Am. Ent. Soc. **29**: 129–136.

Many species listed, including *Apterigida buscki* (Blattidae), p. 129 and *Lamponius portoricensis* (Phasdimae), p. 132 as new species from Puerto Rico. *Neoblatella adspersicollis* Stal.

1903 *b*. Studies in American Blattidae. Trans. Am. Ent. Soc. 29: 268–285.

Blatella azteca S. & Z., p. 268, *Periplaneta americana* L., p. 280 and *Panchlora hyalina* Sauss., p. 285 listed from the Island and *Pelmatosilpha coriacea*, pp. 278–279 as a new species from Puerto Rico.

1904. Studies in the orthopterous family Phasmidae. Proc. Acad. Nat. Sci. Phila. **56**: 68–69.

Aplopus achalus (Phasmidae) described from Puerto Rico as a new species.

1906. The orthoptera of the Bahamas. Bul. Am. Mus. Nat. Hist. **22**(Art. 5): 110, May 23.

A foot-note states "This is the species recorded by me as *B. punctulata* from Puerto Rico (Trans. Amer. Ent. Soc. xxix p. 130) and *B. azteca* from Puerto Rico and Jamaica (Ibid., xxix, p. 268)." The species referred to is *Neoblatella adspersicollis* Stal.

1910. On some Orthoptera from Porto Rico, Culebra and Vieques Islands. Bul. Am. Mus. Nat. Hist. **28**(Art. 7): 73–77.

Epilampra wheeleri (Blattidae) as a new species from Puerto Rico, pp. 73–74.

Rehn, J. A. G. and **Hebard, Morgan.** 1927. The Orthoptera of the West Indies. Number 1. Blattidae. Bul. Am. Mus. Nat. Hist. **54**(Art. 1): 1320, 25 pls.

Thirty species from Puerto Rico treated.

Reitter, Edm. 1875. Die Sud—und Mittel—Americanischen Arten der Gattung Tenebroides Pill. et Mitterp. Verh. Nat. Ver. Brünn (for 1874) **13**: 74.

Tenebroides punctulatus listed from Puerto Rico.

1878. Neue Colydiidae des Berliner Museums. Deutsche Ent. Zeitschr. **22**(1): 123.

Penthelispa aquicolle as a new species from Puerto Rico.

1883. Beitrag zur Kentniss der Clavigeriden, Pselaphiden und

Scydmaeniden von Westindien. Deutsche Ent. Zeitschr. **27** (1): 33–46.

Trimiopsis ventricosa on p. 39, *parmata* on p. 40 and *eggersi* on p. 38 as new species from St. Thomas and Puerto Rico.

Richardson Kuntz, Pedro. 1932. Censo de las variedades de caña de azúcar sembradas en Puerto Rico correspondiente a la cosecha de 1931–32. Est. Exp. Ins. Circ. **98**: 14–16.

It is stated that, in the author's opinion, *Diatraea saccharalis* Fab. causes at the present time five times as much damage in the South and East Coast districts as the three most important cane diseases combined, namely mosaic, gummosis and Pokka Boeng. *Phyllophaga* spp and *Scapteriscus vicinus* are also mentioned as being injurious to cane but of secondary importance to the moth borer.

Riley, C. V. 1894. The insects occurring in the foreign exhibits of the world's Columbian Exposition. Insect Life **6**(3): 218.

Cathartus advena Waltl. listed as occurring in Puerto Rico.

Riollano, Arturo. 1931. Rehabilitación agrícola de Vieques. Informe del trabajo realizado. Rev. Agr. P. R. **26**(9): 108–116, March.

Includes notes on several injurious insects including the cotton leafworm, pink bollworm and the cowpea stalk and pod borer, *Fundella cistipennis*.

Ritchie, A. H. *1917. Report of the government entomologist for the year 1916–1917. Suppl. to the Jamaica Gazette, Kingston, **40**(4): 92–97. (Abs. in Rev. Appl. Ent. **5**: 429.)

In discussing *Stenocranus saccharivorus* Westw. as a cane pest mention is made that parasites are an effective check in Puerto Rico, including a Mymarid, a Dryinid and a Strepsipteron.

*1918. Annual report of entomologist. Ann. Rept. Jamaica Dept. Agr. for year ended 31st March, 1918, pp. 34–40. (Abs. in Rev. Appl. Ent. **7**: 56.)

In discussing *Euscepes porcellus* Boh. mention is made that it also occurs in Puerto Rico.

Rivera, Alfonso. 1922. Enfermedades de la piel en el ganado. Ins. Exp. Sta. P. R. Circ. **58**: 1–9.

Notes on the various skin parasites found on cattle, pigs, sheep and goats, with symptoms and remedies; the tick, *Ixodes ricinus* and mange mites are included.

Rivera, Eugenio M. 1927. Informe sobre el trabajo de es-

tudios del gorgojo del ñame del banano por el personal de campo destacado en Utuado, Adjuntas y Jayuya. Rev. Agr. P. R. **19**(2) : 59–62.

Description of a survey to determine the presence of the banana root-weevil in three districts in the Island.

von Roeder, Víctor. 1885. Diptera von der Insel Porto Rico, erhalten durch Herrn Consul Krug in Berlin. Stett. Ent. Zeitung **46** : 337–349.

Several new species described; also other records.

Rohwer, S. A. 1915. Descriptions of new species of Hymenoptera. Proc. U. S. Nat. Mus. **49** : (2105) : 205–249.

The following are described as new from Puerto Rico: *Elis xanthonotus*, p. 234; *Nysson* (*Bathystegus*) *basirufus*, p. 247; *Campsomeris* (*Campsomeris*) *pyrura*, p. 235; *Batozonus hookeri*, p. 237; *Psen* (*Mimesa*) *modesta*, p. 244; *Cerceris margaretella*, p. 248.

1927. Some Scoliid wasps from Tropical America. Jour. Wash. Acad. Sci. **17**(6) : 150–155.

Includes a note on *Campsomeris hesterae* n. sp. which has been imported from Venezuela into Puerto Rico where it has oviposited on larvae of *Lachnosterna portoricensis* Smyth.

Root, F. M. 1922. Notes on mosquitoes and other blood-sucking flies from Porto Rico. Am. Jour. Hygiene **2**(4) : 394–405, 5 figs.

An annotated list of all blood-sucking Diptera recorded to-date from the Island; 15 mosquitoes, of which *Culex* (*Choeropora*) *borenqueni* is described as new, are listed and the larvae of several are desribed: *Chrysops variegatus* DeG. (as *costatus* Fab.) and *Stomoxys calcitrans* are also listed.

Rosenfeld, A. H. 1925 *a*. The food of Porto Rican lizards. Jour. Econ. Ent. **18**(2) : 422–423.

A note on the small lizard, *Anolis cristatelus* D. & B. attacking a moth of *Protoparce sexta* Joh., var. *jamaicensis* Butler about the same length of body as itself.

1925 *b*. Why not Trap-Crops that Entrap? Jour. Ec. Ent. **18**(4) : 639–640.

Experiment on *Melinis muistiflora* as a tick-deterrent.

Rothschild, W. 1912. New Syntomidae. Novitates Zool. **19**(2) : 155.

Describes *Empyreuma sanguinea portoricensis* as a new race from Puerto Rico. Dr. W. T. M. Forbes considers this as merely typical *E. pugione* L.

Rothschild, W. and **Jordan, K.** 1903. A revision of the lepidopterous family Sphingidae. Novitates Zool. 9, Suppl., 972 pp., 67 pls.

A world revision of the family including all known locality records, many of which are from Puerto Rico.

Russell, H. M. 1912. The red-banded thrips. U. S. Bur. Ent. Bul. 99, Pt. 2, p. 17.

Foot-note recording *Mesothrips ficorum* Marchal (=*Liothrips bakeri* Crawf.) on Ficus from Puerto Rico.

Saavedra, E. F. 1929. La oruga rosada de la cápsula del algodón en Puerto Rico. Rev. Agr. P. R. **23**(5) : 207 and 216.

Brief popular account of the pink bollworm with control measures.

Sasscer, E. R. 1920. Important foreign insect pests collected on imported nursery stock in 1919. Jour. Econ. Ent. **13**(2) : 184.

Lists *Targionia sacchari* Ckll. on sugar cane and *Pseudococcus crotonis* Green on orchid, both from Puerto Rico.

1921. Important insects collected on imported nursery stock in 1920. Jour. Econ. Ent. **14**(4) : 354.

Records *Cylas formicarius* in sweet potato tubers and *Euscepes batatae* in yams arriving in the U. S. from Puerto Rico.

Saussure, H. 1859. Orthoptera Nova Americana (diagnoses preliminares). Rev. et Mag. Zool., 2nd Ser., **9** : 62–63.

Phibalosoma ceratocephalum Gray described as a new species from Puerto Rico as *Acanthoderus* (*Xylodus*) *adumbratus*.

1868. Phasmidarum novarum species non nullae. Rev. et Mag. Zool., (Ser. 2) **20** : 65.

Dyme (*Bacteria*) *yersiniana* as a new species from Puerto Rico.

1878. Mélanges orthoptérologiques. Fasc. **6**, 702–703; 747–748, pl. 18, fig. 64, 1 and 2.

On pp. 747–748 *Laurepa* (*Apithes*) *krugii* (Gryllidae) is described as a new species from Cuba, not Puerto Rico; on pp. 702–703 *Diatripus sibilans* is described as a new species from Puerto Rico.

[1893. Orthoptera in Biol. Centr. Am. **1** : 85.

Plecoptera krugi (Blattidae) as a new species from Cuba. (Wolcott in his "List" says the type is from Puerto Rico)].

1897. Orthoptera. Biol. Centr. Am. **1**: 276–277.

Orocharis vaginalis and *O. terebrans* (Gryllidae) as new species from Puerto Rico.

Schaufuss, L. W. 1882. Coléopteres aveugles de la famille des Colydidae. Ann. Soc. Ent. France, (Ser. 6) **2**: 46–48.

Cryptozoon nitidicollis as a new genus and species from Puerto Rico.

Seely, R. M. 1928. Revision of the spider genus Tetragnatha. N. Y. State Mus. Bul. **278**, pp. 106 and 133, pl. 1, figs. 1–4 and pl. 3, figs. 40–43.

T. antilliana Simon, p. 106 recorded on the authority of Banks (1901) and *T. pallescens* Cambridge p. 133 recorded from Puerto Rico at Toa Baja, Garb collector.

Seín Jr., Francisco. 1923 *a*. Cucarachas. Est. Exp. Ins. Circ. **64**: 1–12.

A discussion of the injurious cockroaches in Puerto Rico and their control.

1923 *b*. Las abejas en los cafetales. Est. Exp. Ins. Circ. 79: 1–6.

Observations to show that beekeeping is not injurious to the setting of berries in the coffee farms, but rather that the bees are beneficial.

1923 *c*. El gorgojo del ñame del guineo. Est. Exp. Ins. Circ. **82**: 1–7, 2 figs.

Brief general account of the banana rootweevil in Puerto Rico with control measures.

1926. La oruga de la raíz de la caña. Un insecto que no se sabía existiera en Puerto Rico y que causa mucho daño. Rev. Agr. P. R. **17**(2–3): 17.

Notes on the sugar cane root-caterpillar, *Perforadix sacchari* Sein in Puerto Rico.

1927. El sapo. Rev. Agr. P. R. **19**(5): 238–240.

Notes on the imported toad, *Bufo marinus* L., in Puerto Rico.

1928. Sericultura Rev. Agr. P. R. **20**(2): 51–53.

Brief general popular account of the silk industry and remarks on its attempted initiation in Puerto Rico.

1929 *a*. Report of the division of entomology. Ann. Rept. Ins. Exp. Sta. P. R. for 1927–1928, pp. 89–98.

Altho no authorship is assigned in this report it was prepared by Mr. Seín. It includes notes on sugar cane root insects and mosaic transmission, *Anastrepha* does not attack citrus, banana root-weevil and on failure of *Ipobracon grenadensis* to become established.

1929 *b*. El gorgojo del ñame del guineo en Puerto Rico. El Mundo, San Juan, P. R., October, 6, p. 15, 4 figs.

A general account of the banana root-weevil in Puerto Rico including control measures outlined in detail.

1929 *c*. Nuevas cosechas, nuevas plagas. Rev. Agr. P. R. **23** (2): 84–86.

A note on the potato tuber moth (*Phthorimaea operculella* Zell.) attacking Irish potatoes for the first time in Puerto Rico.

1929 *d*. Una invasión de mariposas. Rev. Agr. P. R. **22**(10): 169–170.

Notes on a large migration of *Anosia plexippus* L. in Puerto Rico.

1930 *a*. A new mechanical method for artificially transmitting sugar-cane mosaic. Jour. Dept. Agr. P. R. **14**(2): 49–68.

1930 *b*. The sugar cane root caterpillar and other new root pests in Puerto Rico. Jour. Dept. Agr. P. R. **14**(3): 167–191, 10 pls.

Complete account of *Perforadix sacchari* Seín (Pyralididae, Endotrichinae) new genus and species in Puerto Rico, including descriptions of all the stages and suggestions for lessening the injury. A Symphilid, *Hanseniella* sp., two bristle-tails, *Nicoletia* sp. and *Lepisma* sp., a sow-bug, *Philoscia culebrae* Moore, white grubs, nematodes, the larvae of *Diaprepes spengleri* and a mite are all discussed as to their relation to root injuries to sugar cane in Puerto Rico.

1930 *c*. Nuevo método de transmitir el matizado y su aplicación práctica. Rev. Agr. P. R. **25**(2): 64–65, 94.

A brief account of a new method of transmitting artifically sugar cane mosaic and its practical application. This method is described in detail in Seín 1930 *a*, which see.

1930 *d*. Insectos que atacan la alfalfa en Puerto Rico. Rev. Agr. P. R. **25**(2): 91.

A brief account of *Dichomeris piperata* Wlsm. as a new pest of alfalfa.

1930 *e*. *Dichomeris piperatus* Walsingham, a pest of alfalfa in Puerto Rico. Jour. Econ. Ent. **23**(5): 885–886.

A brief note on this species as a new pest of a new crop.

1931 *a*. The pickle worm in chayote in Porto Rico. Jour. Econ. Ent. **24**(3) : 762.

1931 *b*. Informe sobre el brote del "Apate francisca" en Lares. El Agricultor Puertorriqueño **11**(7) : 24, San Juan.

Records a destructive outbreak of the coffee stem-borer in coffee and several other economic food-plants.

1931 *c*. El peligro de que pueda introducirse una nueva plaga del café. Bol. Agric. **1**(17) : 2, December 5, San Juan.

A short note on the danger of introducing the coffee weevil, *Stephanoderes coffea,* into Puerto Rico.

1932 *a*. Artificial transmission and other studies on sugar cane mosaic. Proc. Fourth Congress Int. Soc. Sugar Cane Techs., pp. (Preprint Bul. **84**) : 1–6, San Juan.

Includes notes on *Aphis maidis* and *Sipha flava.*

1932 *b*. Soil animals and root disease in Porto Rico. Proc. Fourth Congress Int. Soc. Sugar Cane Techs. pp. (Preprint Bul. **91**) : 1–2, San Juan.

Sepúlveda, A. E. 1931. La oruga roedora de la hoja del algodón. Campaña para combatirla. Rev. Agr. P. R. **26**(9) : 88, March.

Notes on a control campaign against a bad outbreak of the cotton leaf worm.

Sharp, David. 1890. Biologia Cent. Am. Coleoptera. Nitidulidae. **1**(2) : 304.

Coproporus (as *Erchomus*) *rutilus* as a new species from St. Thomas and Puerto Rico and *Colopterus* (as *Colastus*) *truncatus* Rand. listed from Puerto Rico.

Sicard, A. 1922. Descriptions de variétes, especes, et genres nouveaux appartenant a la famille de Coccinellides. Ann. and Mag. Nat. Hist., (Ser. 9) **9** : 349–360.

Scymnillus varipennis, S. nunenmacheri, Scimnillodes cyanescens, and *Psorolymna maxillosa,* all as new species from Puerto Rico.

Smyth, E. G. 1916. Report of the South Coast laboratory. Fourth Rept. Bd. Comm. Agr. P. R. from July 1st to June 30th 1915, pp. 44–50.

Note on fumigation with sulfur of boats with cane coming to Puerto Rico from Santo Domingo to prevent introduction of *Calisto pulchellus* (as *archebates*); white grub life-history studies.

1917 *a*. Report of the entomological department. Ann. Rept. Ins. Exp. Sta. P. R. from 1st July, 1916 to 30th June, 1917, pp. 96–106.

A summary of incoming plant inspection interceptions; reference is made to the fumigation of sugar cane entering from Santo Domingo to prevent introduction of the cane butterfly, *Calisto pulchellus* (*C. archebates* is used).

1917 *b*. The white grubs injuring sugar cane in Porto Rico. I. Life-cycles of the may beetles or melolonthids. Jour. Dept. Agr. P. R. **1**(2) : 47–92, 8 pls. and **1**(3) : 141–169.

P. portoricensis, vandinei, citri, guanicana, described as new species.

1918. Cómo combatir el gorgojo de la batata. Rev. Agr. P. R. **1**(3) : 136–139.

Control of the sweet potato weevil.

1919 *a*. A résumé of plant quarantine work in Porto Rico from July 1910 to July 1919. Ins. Exp. Sta. P. R. Bul. **23**, 56 pp., 20 tables.

The title of the bulletin itself is "Plant inspection and quarantine report (1918–19)."

1919 *b*. Insects and mottling disease. Jour. Dept. Agr. P. R. **3**(4) : 83–116.

Inoculation experiments with several species of insects.

1919 *c*. An annotated bibliography of Porto Rican cane insects. Jour. Dept. Agr. P. R. **3**(4) : 117–134.

1919 *d*. List of the insects and mite pests of sugar cane in Porto Rico. Jour. Dept. Agr. P. R. **3**(4) : 135–150.

1919 *e*. Un insecto extraño que cubre su cría lo mismo que una gallina. Rev. Agr. P. R. **2**(4) : 27–31, 2 figs.

Notes on the habits of *Pachycoris torridus* Scop.

1919 *f*. Dominio de insectos de los cítricos en Puerto Rico. Rev. Agr. P. R. **3**(1) : 39–50 and **3**(3) : 55–62.

Directions for the control of the more important citrus insects.

1919 *g*. Cómo se coleccionan y conservan los insectos. Rev. Agr. P. R. **3**(2) : 17–33.

Directions for collecting and preserving insects.

1919 *h*. Dominio de la plaga de la mosca del ganado en Puerto Rico. Rev. Agr. P. R. **3**(5) : 10–**24**(6) : 17–28, 4 pls.

Suggestions on the control of the horn fly of cattle, ***Haematobia*** *irritans* L.

1919 *i*. Dominio de la plaga de la mosca cornúpeta del ganado en Puerto Rico. Rev. Agr. P. R. **3**(6) : 17–28.

Almost the same as above.

1919 *j*. Report of the Division of entomology. Ann. Rept. Ins. Exp. Sta. P. R. 1st July, 1917 to 30th June, 1918 pp. **109**–129.

Notes on insect pest interceptions in connection with quarantine work; experiments in dissemination of sugar cane mosaic by insects; cane insects; rhinoceros beetle injury to coconuts; vegetable insects and on termites.

1919 *k*. Report of the division of entomology. Ann. Rept. Ins. Exp. Sta. P. R., 1918–1919, pp. 27–31.

Notes on further experiments in the transmission of sugar cane mosaic by insects and on experiments with paraffin oil emulsion for the control of scale insects; this latter was ineffective against *Pseudococcus nipae* on guava.

1920 *a*. The white grubs injuring sugar cane in Porto Rico. II. The rhinoceros beetles. Jour. Dept. Agr. **4**(2) : 3–29, 4 pls.

A detailed study of the economic importance, life history and control of *Strategus titanus* and *S. quadrifoveatus*.

1920 *b*. Nuestro amigo el Anolis. Rev. Agr. P. R. **4**(5) : 11–21.

Notes on the various insects eaten by the abundant and wide-spread lizards of the genus Anolis in Puerto Rico.

1920 *c*. Informe de la división de entomología. Mes de junio. II. La junta técnica de cuarentena. Rev. Agr. P. R. **5**(4) : 29–34.

Notes on cotton insects and the visit of U. C. Loftin to look for the cotton pink bollworm.

1920 *d*. Cotton insects in Porto Rico. Ent. News **31**(5) : 121–125.

A summary account of all the insects observed to date affecting cotton in the Island with notes on their distribution, injury and control.

1920 *e*. To keep out cane butterfly. Jour. Econ. Ent. **13**(1) : 149.

Note on successful efforts of the plant quarantine officials in Puerto Rico to keep cane from being shipped into the Island from Santo Domingo in order to prevent the introduction of the cane butterfly, *Calisto pulchellus* (given as *C. archebates*).

1920 *f*. Annual report, division of entomology. Ann. Rept. Ins. Exp. Sta. 1919–20, pp. 83–89.

Notes on continuation of work with insects as transmitters of cane mosaic, inauguration of a special plant quarantine service and recent regulations against cotton from Puerto Rico on account of *Eriophyes gossypii*.

1921. La mosca del ganado. Est. Exp. Ins. Circ. **39** : 1–17, 4 pls.

General account of the horn fly of cattle in Puerto Rico with remedies. A revision of Smyth 1919 *h*.

Snyder, P. G. 1920. Beekeeping in foreign lands. Gleanings in Beeculture **48** : 721–724, 3 figs.

Refers entirely to conditions in Puerto Rico.

Snyder, T. E. 1923. A new Glyptotermes from Porto Rico. Proc. Ent. Soc. Wash. **25**(4) : 91–93, pl. 8.

Glyptotermes corniceps from Boquerón, P. R.

1924. Descriptions of new species and hitherto unknown casts of termites from America and Hawaii. Proc. U. S. Nat. Mus. Vol. **64**, (No. 2496, Art. 6) : 10–12, pl. 2.

Glyptotermes pubescens as new from Puerto Rico.

Stahl, Agustín. 1882. Fauna de Puerto Rico. Clasificación sistemática de los animales que corresponden a esta fauna y catálogo del gabinete zoológico del Doctor A. Stahl en Bayamón, P. R. Imprenta del Boletín Mercantil, San Juan, P. R. Insects, Pt. 2, pp. 169–213.

A list of the species of insects in Dr. Stahl's collection in Bayamón, P. R., from Cuba, Trinidad and Puerto Rico.

* 1894. La enfermedad de la caña y el caculo. Imp. Sucesión J. J. Acosta, 18 pp., San Juan P. R. (Reference from Pedreira.)

Stevenson, J. A. 1918 *a*. Cuarentena de las plantas. Rev. Agr. P. R. **1**(4) : 176–180.

A brief article on the reasons for and operations of plant quarantines.

1918 *b*. The green muscardine fungus in Porto Rico. (*Metarizhium anisopliae* (Metsch.) Sorokin.) Jour. Dept. Agr. P. R. **2**(1) : 19–32, 3 figs.

The species of insects attacked by the fungus in breeding cages in Puerto Rico is given and includes *Phyllophaga* and other common Scarabeids. Conclusion is reached that it will not serve as a practical means of controlling white grubs in the Island due to great dependance on humidity and other factors.

Stevenson, J. A. and **Cotton, R. T.** 1918. Preparation and use of lime-sulfur. Ins. Exp. Sta. Circ. **13**, 9 pp.

Strong, L. A. 1921 *a*. Quarantine Division. Reports for the months of July and August 1921. Mthly. Bul. Cal. Dept. Agr. **10**(9) : 381–385.

Records *Lepidosaphes beckii* intercepted on grapefruit from Puerto Rico.

1921 *b*. Quarantine division. Synopsis of work for the month of March, 1921. Mthly. Bul. Cal. Dept. Agr. **10**(5–6) : 212.

Lepidosaphes beckii listed as intercepted on grapefruit from Puerto Rico.

1922. Bureau of plant quarantine. Synopsis of work for the months of January and February 1922. Mthly. Bul. Cal. Dept. Agr. **9**(5–6) : 471–476.

Records *Lepidosaphes* beckii intercepted on oranges from Puerto Rico.

Suffrian, C. G. L. E. 1852. Zur Kentniss der Nordamerikanischen Cryptocephalen. Linnaea Entomologica **6** : 282–283 and **7** : 85 and 203.

Vol. **6** : 282–283, *Cryptocephalus nigrocinctus* as a new species and Vol. **7** : 85 and 203, *Cryptocephalus polygrammus* and *Pachybrachys praetextatus* as new species, all from Puerto Rico.

Tapia y Rivera, Alejandro. 1854. Biblioteca histórica de Puerto-Rico, que contiene varios documentos de los siglos XV, XVI, XVII y XVIII, coordinados y anotados, 6 + 587 pp. + 14, Puerto Rico.

On pp. 21–22 is a brief note that in 1510 Sotomayor founded the settlement of Guánica which he and his companions were obliged to vacate because of the great abundance of mosquitoes. (Oviedo, q. v.).

Teague, M. M. 1925. A review of the genus Aclerda (Hemiptera; Coccoidea). Ann. Ent. Soc. Am. **18**(4) : 439, 3 figs.

Aclerda sacchari described as a new species from Arecibo and Morovis, P. R., on stalks and roots of sugar cane (Geo. N. Wolcott, collector).

Thomas, W. A. 1928. The Porto Rican mole cricket. U. S. Farmers' Bul. 1561, pp. 1–9. 3 figs.

General account of economic importance, life-history, and control of *Scapteriscus vicinus* Latr. which was introduced into the Southern States supposedly from Puerto Rico, probably in the ballast of ships.

Torres, Ignacio L. 1927. El gorgojo del ñame del guineo. (*Cosmopolites sordidus*). Rev. Agr. P. R. **19**(2) : 56–58, 2 figs.

A general popular account of the insect and its control in Puerto Rico.

1928. Algo sobre algodón Sea Island. Rev. Agr. P. R. **22**(9) : 91–92, 3 figs., March.

Brief account of the cotton industry in Puerto Rico and of the more important insect pests and their control.

1929. El cultivo de papas en Puerto Rico. Rev. Agr. P. R. **24**(6) : 239–242.

It is stated on p. 241 that more or less damage was done to experimental plots of Irish potatoes at Cidra, Comerío, Barranquitas, Adjuntas, and Lares by mole crickets, flea-beetles, white grubs, the potato tuber moth, *Phthorimaea operculella*, and the cutworm, *Xylomiges sunia*; good control of leaf-feeders was obtained in an experimental plot at Lares with copper-lime-arsenate dust.

1931. Campaña contra el gusano rosado del algodón. Rev. Agr. P. R. **26**(11) : 175–176, May.

A radio talk to explain to cotton growers the bad situation with regard to the pink boll worm and to outline measures for its relief.

Tower, W. V. 1907. Report of the entomologist and plant pathologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1906, pp. 25–28.

This is Mr. Tower's first report. Brief notes on the status and control of insects attacking citrus, coffee and cane.

1908 *a*. Report of the entomologist and plant pathologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1907, pp. 31–38.

Notes on insects affecting citrus, tobacco, vegetables, sugar cane and pineapples.

1908 *b*. Control of the brown ant (*Solenopsis geminata* Fab.)

and the mealy bug (*Pseudococcus citri* Risso) in pineapple plantations. P. R. (Mayagüez) Agr. Exp. Sta. Circ. **7**: 1–3.

The mealy bug is *Pseudococcus brevipes* Ckll. instead of *citri*.

1909. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1908, pp. 23–28.

Notes on insects affecting citrus, pineapples and coffee; Italian bees introduced.

1910. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1909, pp. 24–28.

Notes on insects affecting citrus, on white grub injury to cane, on cigarette beetle fumigation and on apiculture.

1911 *a*. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1910, pp. 31–34.

Notes on guava insects, citrus fumigation, the coffee shade-tree ant and on apiculture; brief report on a trip to Cuba to study cane insects.

1911 *b*. Insects injurious to citrus fruits and methods for combating them. P. R. (Mayagüez) Agr. Exp. Sta. Bul. 10, 35 pp., 5 pls. Also a Spanish edition of 36 pp. in 1912.

General account of the more important species present; the first comprehensive account for the Island.

1911 *c*. Beekeeping in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Circ. **13**: 1–31 pp., 1 pl. Also a Spanish edition.

1912 *a*. A study of the mosquitoes in San Juan, Porto Rico. P. R. (Mayagüez) Agr. Esp. Sta. Circ. **14**: 1–23. Also a Spanish edition in 1913.

1912 *b*. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1911, pp. 32–36.

Notes on apiculture and on citrus and mango insects.

1912 *c*. Beekeeping in Porto Rico. First Ann. Rept. P. R. Hort. Soc. for 1912, pp. 64–68.

Brief notes on the possibilities of developing a beekeeping industry in Puerto Rico and notes on the more important honey plants.

1920 *a*. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1918, pp. 15–17.

Mostly notes on apiculture.

1920 *b*. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1919, pp. 21–25.

Notes on mosaic transmission tests and on honey plants; a citrus thrips population survey noted is especially interesting altho the species involved were, apparently, not determined; injury to oranges was noted in several places.

1921 *a*. Report of the entomologist. P. R. (Mayagüez) Exp. Sta. Rept. for 1920, pp. 23–27.

Brief notes on apiculture, mosquitoes, cattle ticks and on scale insects of citrus.

1921 *b*. Mosquito survey of Mayagüez. P. R. (Mayagüez) Agr. Exp. Sta. Circ. **20**: 1–10 pp.

1922. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1921, pp. 23–26 (published as U. S. Dept. Agr., Office of Exp. Sta. Bul. 171).

Records trials of sugar cane mosaic transmission with *Sipha flava* and other insects; notes on cattle tick work and on apiculture.

1923. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1922, pp. 13–14.

A report on spraying experiments for the control of citrus scab.

1923. The cigar beetle. P. R. (Mayagüez) Agr. Exp. Sta. Agr. Ext. Notes No. 60, 1 p. (mimeographed).

Damage to cigars and to loose leaf tobacco in bales by *Lasioderma sericorne* F. in Puerto Rico is described and advantages of fumigation are pointed out.

1924. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1923, pp. 11–15.

Notes on fumigation for the cigarette beetle in tobacco factories, control of citrus insects, cotton insects and melon and cucumber insects.

Tracy, S. M. 1903. La cría del cerdo en el sur. Dept. Int. P. R., Neg. Agr. y Minas, Bol. Agr. 8. pp. 45–46.

A Spanish translation of U. S. Farmers' Bul. 100 "Hog raisng in the South," 1899, which includes a brief description of the hog louse and its control.

Tucker, C. M. 1924. The coconut bud-rot in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Agr. Notes No. 2, 2 pp., 15th April.

Stated that insects are attracted to decaying buds and rotted

portions and are one of the means of disseminating the disease in Puerto Rico.

U. S. Dept. Agr., Fed. Hort. Bd. 1922. Service and Regulatory announcements, July–December 1921, No. 71, pp. 95–178. (Abs. in Rev. Appl. Ent. **10**: 595.)

Note on the extended infestation in Puerto Rico of *Pectinophora gossypiella* from which the U. S. is protected from introduction by the quarantine recently having been extended to Puerto Rico.

1925. Fruit and vegetable quarantine of Porto Rico. Notice of quarantine 58, 5 pp., May 27.

Anastrepha fraterculus, the West Indian fruit fly, and *Maruca testulalis*, the bean pod-borer, are specifically mentioned.

1926. Hawaiian and Porto Rican quarantine covering sand, soil or earth, with plants. Notice of quarantine No. 60, 1 p., February 19.

To prevent the spread of Lachnosterna and several species of Termites no sand, soil or earth around the roots of plants may be moved from these countries into the U. S. except for experimental or scientific purposes, effective March 1, 1926.

U. S. Dep. Agr., P. Q. C. A. 1929. [Administrative instructions concerning Mediterranean fruit fly quarantine.] Circ. Nos. 229 & 234, 2 pp., multigraph, Washington, D. C.

No host fruit or host vegetable from Florida may be moved or reshipped to any of 18 southern or western states or to Puerto Rico.

Van Deusen, Elizabeth Kneipple. 1930. Famous Porto Ricans of the past. Augustín Stahl. P. R. School Rev. **14**(5): 26–27.

A biographical sketch of the foremost pioneer student of the natural history of Puerto Rico.

Van Deusen, R. J. and E. K. 1931. Porto Rico—A Caribbean Isle. 342 pp., many illustrations, New York.

A general history of Puerto Rico from prehistoric times to the present day. On p. 54 is a reference to the mosquito plague at Guánica in the year 1510.

Van Dine, D. L. 1911. (Cane insects). First report of the entomologist of the experiment station. Sugar Growers' Ass. P. R. Exp. Sta. Bul. 1, pp. 17–31. Also in Yearbook of Assn. Sugar Prod. P. R. for 1910–1911, pp. 43–57.

A general discussion of the more important sugar cane insects and their status in Puerto Rico.

1912 *a*. Report of the entomologist. Second annual report Sugar Prod. Assn. P. R. Exp. Sta. for the year 1911–1912, pp. 15–22.

Notes on the progress of investigations on various sugar cane insects.

1912 *b*. Daño ocasionado al jugo de la caña por el barreño del tallo o "borer". (*Diatraea saccharalis* Fab.) Est. Exp. Asoc. Prod. Azúcar P. R. Circ. **1**: 1–11. Also an English edition, same date and number of pages entitled "Damage to sugar-cane juice by the moth stalk-borer".

1912 *c*. Progress report on introductions of beneficial parasites into Porto Rico. First Rept. Bd. Comm. Agr. P. R. for July 1, 1911–Jan., 1912, pp. 31–47.

Report on the preliminary studies in the U. S. and introduction from Illinois thru C. E. Hood of *Tiphia* parasites of white grubs; copy of Hood's report is included; also a record of the introduction of the lady beetle, *Cryptolaemus montrouzieri* from Calif. for *Pseudococcus* spp.

1912 *d*. The mango insect pests of Hawaii. First Ann. Rept. P. R. Hort. Soc. for 1912, pp. 15–19. La Bandera Press, Mayagüez.

Notes on the principal mango insects of Hawaii presented for the information of growers in Puerto Rico.

1912 *e*. Mango insects in Porto Rico. First Ann. Rept. P. R. Hort. Soc. for 1912, pp. 20–22.

Notes on the mango fruit fly (Anastrepha sp.), a scale insect and a thrips.

1913 *a*. The introduction of parasites of may-beetles into Porto Rico. Second Rept. Bd. Comm. Agr. P. R. for 1912–1913, pp. 36–48.

The work referred to in the previous report is reviewed and that done since, including Wolcott's activities in Illinois and his West Indian trip to study sugar cane insects and their parasites; breeding notes on the introduced *Tiphia*.

1913 *b*. Report of the entomologist. Third Ann. Rept. (Bul. 5) Sugar Prod. Assn. P. R. Exp. Sta., pp. 23–46.

1914. Informe del entomólogo. Bol. 5, Est. Exp. Asoc. Prod.

Azúcar de Puerto Rico. (Tercer inf. anual), pp. 27–48. (The Spanish edition of the preceding.)

Includes a list of 30 sugar cane insects in Puerto Rico and a bibliography of 41 titles.

* 1913 *c*. Insects injurious to sugar cane in Porto Rico and their natural enemies. Jour. Bd. Agr. British Guiana **4**(4) : 199–203, April.

According to Wolcott (see his "List" p. 14) this contains the same information as in Van Dine 1913 b and d. The volume may be No. 6. I have not seen this personally.

1913 *d*. The insects affecting sugar cane in Porto Rico. Jour. Econ. Ent. **6** : 251–257.

A brief summary of all the insects found affecting sugar cane during the two years entomological investigations have been in progress at the P. R Sugar Producers' Exp. Station; brief previous history.

van Leenhoff, J. W. 1906. Report of the coffee specialist. Diseases and insect pests. P. R. (Mayagüez) Exp. Sta. Rept. for 1905, pp. 46–47.

Brief notes on *Leucoptera coffeella, Saissetia hemisphaerica* and leaf weevils (*Lachnopus*).

1907. Report of the coffee expert. Diseases and insect pests. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1906, pp., 31–32.

Mostly a brief note on a fertilizer experiment for the control of the coffee leaf-miner with results apparently negative to date.

1908. Report of the coffee expert. Diseases and insect pests. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1907, p. 40.

Note on a borer; the leaf-miner fertilizer experiment referred to previously is reported successful.

van Volkenberg, H. L. 1929 *a*. Report of the parasitologist. P. R. (Mayagüez) Agr. Expt. Sta. Rept. for 1927, pp. 28–31.

Several external parasites of domestic animals and poultry are recorded.

1929 *b*. Report of the parasitologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1928, p. 36.

Screw-worm flies are reported as common and open wounds in animals are always liable to infestation by the maggots.

1930. Report of the parasitologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1929, pp. 26–29.

Notes on cattle tick eradication.

1931. Report of the parasitologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1930, pp. 38–40.

Notes on the occurrence of a tapeworm cysticercoid in the dung beetle, *Ataenius stercorator* Fab. and in the water beetle, *Tropisternus collaris* Fab.

1932. Report of the parasitologist. P. R. (Mayagüez) Agr. Expt. Sta. Rept. for 1931, pp. 24–27, 1 fig.

Notes on various external parasites of livestock, including ticks, flies of various kinds, fleas and lice; an interesting observation is that the water-beetle, *Tropisternus collaris* Fab. is an intermediate, and apparently important, host of the thorny-headed worm, *Macracanthorynchus hirundinaceus*, of swine.

van Zwaluwenburg, R. H. 1915. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. for 1914, pp. 31–25.

Notes on mole crickets, coffee leaf-miner, coffee shade-tree insects and on other miscellaneous insects and on honeybees.

1916 *a*. Report of the entomologist. P. R. (Mayagüez) Agr. Expt. Sta. Rept. for 1915, pp. 42–45.

Notes on insects attacking coffee and coffee shade-trees, vegetables and on white ants, the coconut rhinoceros beetle and several miscellaneous pests.

1916 *b*. Notes on the life-history of *Ecpantheria eridanus* Cramer. Insec. Ins. Men. **4** : 12–17.

The studies were made in Puerto Rico.

1917. Insects affecting coffee in Porto Rico. Jour. Econ. Ent. **10**(6) : 513–517.

A summary of the knowledge of this subject up to that time.

1918 *a*. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1916, pp. 25–28, 1 pl.

Notes on the cattle tick, mole cricket, may beetles, apiculture and miscellaneous insects.

1918 *b*. Report of the entomologist. P. R. (Mayagüez) Agr. Exp. Sta. Rept. for 1917, pp. 31–34.

Life-history data on the cattle tick, notes on a Phorid fly destructive to corn kernels and miscellaneous notes.

1918 *c*. The changa or West Indian mole cricket. P. R. (Mayagüez) Agr. Exp. Sta. Bul. **23**: 1–27 pp., 3 pls.

An excellent general account with extensive bibliography.

Van Zwaluwenburg R. H. and **Thomas, H. E.** 1918. Some means of controlling insects, fungi and other pests in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Circ. **17**: 1–30.

General account with control measures.

Van Zwaluwenburg, R. H. and **Vidal, Raphael.** 1918. Rearing queen bees in Porto Rico. P. R. (Mayagüez) Agr. Exp. Sta. Circ. **16**: 1–12, 5 figs. Also a Spanish edition.

Varas Catalá, Juan. 1922. Tabla por la que deberán regirse los ganaderos al preparar la solución arsenical con el concentrado Atlas cattle dip. Rev. Agr. P. R. **8**(3): 65–66.

Vickery, R. A. 1926. Observations on *Cirphis latiuscula* H. Sch. in the Gulf region of Texas. Jour. Agr. Res. **32**(12): 1099–1119, 3 figs., 14 refs.

Stated that this species is known in Tropical America, especially in Cuba and Puerto Rico as a pest of sugar cane and other large grasses.

Vidal, Rafael. 1916. Some of the needs of the Porto Rican Beekeeper. Gleanings in Beeculture **44**: 409–410, 1 fig.

Viereck, H. L. 1913. Descriptions of ten new genera and twenty-five new species of ichneumon-flies. Proc. U. S. Nat. Mus. **44**: (No. 1968): 555–568.

The following are described as new species from Puerto Rico: *Crassimicrodus fenestratus, Apanteles* (*Protapanteles*) *mayaguensis, Opius* (*Utetes*) *anastrephae, Eiphosoma* (*Brachixiphosoma*) *insularis* and *Cristolimorpha plesius.*

Voorhees, E. B. 1903. Cultivo del tomate en los Estados Unidos. Dept. Int. P. R., Neg. Agr. y Minas Bol. Agr. 15, pp. 44–45.

Brief general account of tomato insects in this Spanish translation of U. S. Farmers' Bul. 76 on "Tomato Growing," 1898.

Walsingham, Lord. 1892. On the Microlepidoptera of the West Indies. Proc. Zool. Soc. London for 1891, pp. 492–549, 1 pl. (41).

Includes a number of species specifically stated to occur in Puerto Rico; apparently none described as new.

1897. Revision of the West Indian Microlepidoptera, with descriptions of new species. Proc. Zool. Soc. London for 1897, pp. 54–182.

This brings the previous paper up to date.

Walton, W. R. 1912. A new species of Tachinidae from Porto Rico. Proc. Ent. Soc. Wash. **14**(4): 198–200, 1 pl.

Cryptomeigenia aurifacies, a parasite of May-beetles.

1913. New North American Tachinidae (Dipt.). Ent. News **24**(2): 49–51, pl. 3, figs. a-f.

Eutrixoides jonesi as a new genus and species from Puerto Rico. another parasite of May-beetles.

1914. Four new species of Tachinidae from North America. Proc. Ent. Soc. Wash. **16**(2): 93–95.

Linnaemyia fulvicauda and *Compsilura oppugnator* as new species parasitic on *Cirphis latiuscula* H. S. from Puerto Rico.

Watts, R. L. 1903. Cultivo de la cebolla. Dept. Int. P. R., Neg. Agr. y Minas, Bol. Agr. 9, p. 27.

A Spanish translation of U. S. Farmers' Bul. 39 "Onion Culture," 1896, which includes a brief account of the onion maggot and its control.

Weise, J. 1885. Beitrag zur Chrysomeliden—und Coccinelliden-Fauna Portorico's. Archiv für Naturgeschichte 51(1): 144–168, pl. 8.

The following species are described as new: *Lema nigripes* and *Cryptocephalus tristiculus,* p. 147, *krugi,* p. 148, *stolidus,* p. 149, *perspicax,* p. 151 and *nothus,* p. 152; *Pachybrachys mendicus,* p. 153; *Metachroma antennalis,* p. 155; *Leucocera laevicollis,* p. 156; *Galerucella varicornis,* p. 157; *Disonycha pallipes,* p. 159; *Hermoeophaga cylindrica,* p. 160; *Megistops fictor,* p. 162; *Homophyla krugi,* p. 163; *Systena varia,* p. 164; *Octhispa loricata,* p. 166.

Wetmore, Alex. 1916. Birds of Porto Rico. U. S. Dept. Agr. Bul. 326: 1–140 pp., 10 pls. Also published as Bul. **15** Ins. Exp. Sta. P. R., same date.

Contains a great deal of data on insects as the food of Puerto Rican birds.

Wheeler, Wm. M. 1908. The ants of Porto Rico and the Virgin Islands. Bul. Am. Mus. Nat. Hist. 24 (Art. 6): 117–158, pls. 11 & 12.

Describes 8 new species and varieties.

White, W. H. 1916. The sugar-beet thrips. U. S. Dept. Agr. Bul. **421**, p. 2, 8 figs., 2 pls.

Records *Heliothrips femoralis* Reut. as occurring on sugar cane in Puerto Rico.

Wiedemann, C. R. W. 1830. Aussereuropaische zweiflügelige Insekten 2, pp. 41–42.

Sargus bicolor as a new species from Puerto Rico.

Wolcott, A. B. 1923. Two new speciesof West Indian Cleridae (Coleoptera). Am. Mus. Novitates No. 59, 3 pp., 2 figs., February 14.

Callotillus crusoe as a new species from Puerto Rico.

Wolcott, Geo. N. 1913. Report on a trip to Demerara, Trinidad and Barbados during the winter of 1913. Jour. Econ. Ent. **6**(2) : 443–457. Reprinted in Third Ann. Rept. (Bul. **5**) Sugar Prod. Assn. P. R. Exp. Sta. pp. 47–68. Also see "Informe sobre un viaje a Demerara, Trinidad y Barbados durante el invierno de 1913" in Bol. 5, Est. Exp. Asoc. Prod. Azúcar de Puerto Rico (Ser. Inf. Anual), p. 49–71, 1914.

A detailed report on observations on the insects affecting sugar cane and their parasites in the places visited.

1915. Influencia de la lluvia y quemazón de la paja sobre la abundancia de *Diatraea saccharalis*. Est. Exp. Asoc. Prod. P. R. Circ. **7** : 1–6, map. (Also in English "The Influence of Rainfall and the Non-Burning of Trash on the Abundance of *Diatraea saccharalis*".)

1917. Report of the entomologist. Fifth Rept. Bd. Comm. Agr. P. R. for the period from 1st July, 1915 to 30th June, 1916.

Notes on quarantine enforcement and inspection, control of scales on citrus, tobacco flea-beetles and their control, and a number of vegetable insects.

1921 *a*. Los comejenes de Puerto Rico. Est. Exp. Ins. Circ. **44** : 1–14, fig. 12.

General account of the more injurious termites of Puerto Rico and suggestions for their control.

1921 *b*. El caculo taladrador del tallo del cafeto (*Apate francisca* Fabr.). Est. Exp. Ins. Circ. **48** : 1–7, fig. 2.

General account of the coffee stem-borer and its control.

1921 *c*. El minador de las hojas del café, *Leucoptera coffella* Stain. Est. Exp. Ins. Circ. **52** : 1–12, fig. 6.

General account of the coffee leaf-miner and suggestions for its control.

1921 *d*. The minor sugar-cane insects of Porto Rico. Jour. Dept. Agr. P. R. **5**(2)5–46, fig. 19.

1921 *e*. Las plagas del cacao en Santo Domingo y algunas indicaciones para combatirlas. Rev. Agr. P. R. 6(6) : 11–12.

Mention that aphids and mealybugs are common in Puerto Rico as in Santo Domingo as well as in other Tropical countries.

1821 *f*. Annual report of the division of entomology. Ann. Rept. Ins. Exp. Sta. P. R., 1920–21, pp. 47–49.

Experiments in insect transmission of sugar cane mosaic by insects; notes on banana and coffee insects and on *Phthorimaea operculella* Zell., stated to be the most important insect of the year, injuring tobacco, potato tubers and egg plants.

1922 *a*. Los gusanos de la hoja del tabaco. Est. Exp. Ins. Circ. **53** : 1–15, fig. 8, pl. 1.

Brief general account of the horn worm, leaf-miner and cutworms of tobacco.

1922 *b*. Afidos de importancia económica en Puerto Rico. Est. Exp. Ins. Circ. **59** : 1–11, fig. 9.

Brief account of the more important injurious aphids in Puerto Rico.

1922 *c*. Vaquitas de importancia económica en Puerto Rico. Est. Exp. Ins. Circ. **60** :1–20, fig. 20.

Brief account of the more important injurious weevils in Puerto Rico.

1922 *d*. Insectos que atacan los productores almacenados. Est. Exp. Ins. Circ. **65** : 1–8.

Brief account of the principal insects attacking foods and stored products in Puerto Rico.

1922 *e*. Insect parasite introduction into Porto Rico. Jour. Dept. Agr. P. R. **6**(1) : 5–20, fig. 7.

An excellent summary of the history and present status of parasite introduction.

1922 *f*. The influence of the variety of sugar-cane on its infestation by *Diatraea saccharalis* and other factors affecting

the abundance of the moth borer. Jour. Dept. Agr. P. R. **6**(1) : 21–31, fig. 2.

An analysis of the various factors involved: rainfall, varieties and parasites.

1922 *g*. The insects of sugar cane in Santo Domingo. Jour. Dept. Agr. P. R. **6**(1) : 32–37, pl. 1.

An annotated list of 32 species compiled from 5 months' observations by the author, notes made by Tower of Puerto Rico during a trip to the country and from determinations of collections from the Romana Central and from notes by E. G. Smyth of Puerto Rico. Some occur in Puerto Rico.

1922 *i*. The status of entomology in Porto Rico. Jour. Dept. Agr. P. R. **6**(2) : 3–11. (Also either reprinted or abstracted in Sugar (Review) 26 : 93, Feb., 1924, New York.)

A valuable summary of the history of entomological work in the Island and of the activities of the principal workers and agencies by which it has been accomplished.

1922 *j*. Informe de la estación experimental insular. Informe del departamento de entomología. Rev. Agr. P. R. **8**(2) : 65–68.

Notes on several insects injurious during the year.

1922 *k*. Curso de instrucción a los maestros y agentes agrícolas (Entomología). Rev. Agr. P. R. **8**(3) : 21–30.

1922 *l*. Informe sobre un viaje hecho a la región algodonera para observar las plagas de insectos que atacan al algodón. Rev. Agr. P. R. **9**(3) : 15.

1922 *m*. A reaction to a variation in light intensity by the coffee leaf miner. Ecology **3**(1) : 86.

An observation indicating that both the moths and caterpillars of *Leucoptera coffella* are remarkably sensitive to variations in subdued light intensities.

1922 *n*. The distribution of the pink bollworm of cotton, *Pectinophora gossypiella* Saunders, in Porto Rico. Jour. Econ. Ent. **15**(4) : 313–314, map.

Presents a summary of the results of a survey made during the winter and spring of 1922.

1922 *o*. Informe anual de la división de entomología para el

año fiscal de 1921 a 1922. Inf. An. Est. Exp. Ins. P. R., 1921–1922, pp. 55–60.

Notes on experiments in the control of white grubs and in insect transmission of cane mosaic and on coffee insects; several other injurious insects noted and reference is made to the discovery of the pink bollworm and the banana root-weevil during 1921.

1922 *p*. Tres cartas. Rev. Agr. P. R. **9**(5) : 39–40.

Letters concerning beetles which injure the sweet potato, and the cotton leaf worm.

1923 *a*. El cucubano, *Pyrophorus luminosus* Illiger. Est. Exp. Ins. Circ. **50** : 1–8, 3 figs.

Life-history, distribution and economic importance; beneficial habits of larva, which devours large numbers of white grubs (*Phyllophaga* spp.).

1923 *b*. The distribution of the pink bollworm in Porto Rico. Ins. Exp. Sta. Circ. **85** : 1–7, 1 map.

Brief account of spread from time of discovery and results of a survey made during the winter and spring of 1922–1923.

1923 *c*. "Insectae Portoricensis," a preliminary annotated check-list of the insects of Porto Rico, with descriptions of some new species. Jour. Dept. Agr. P. R. **7**(1) : 1–313, 2 pls. (Actual date of publication, March 5, 1924.)

About 2,300 species listed, with localities, food-plants, dates and much biblographical data; 32 species are described as new.

1923 *d*. Entomological papers. The food of Porto Rican lizards. Jour. Dept. Agr. P. R. **7**(4) : 5–37. (issued August, 1924.)

1923 *e*. Entomological papers. First supplement to Insectae Portoricensis. Jour. Dept. Agr. P. R. **7**(4) : 38–43. (Issued August, 1924.)

Corrections and additions.

1923 *f*. An important new pest of beets in Porto Rico. Jour. Econ. Ent. **16**(6) : 459–460.

Notes on the injury, abundance, food-plant and natural enemies of *Disonycha laevigata* Jacoby.

1924 *a*. Entomología Económica Puertorriqueña. Est. Exp. Ins. P. R. Bol. **32** : 1–176, 12 pls. 97 figs.

General account of the more important economic insects in Puerto Rico with control measures. A very useful paper.

1924 *b*. Hormigas. Est. Exp. Ins. P. R. Circ. **75**: 1–11.

General account of the more important injurious ants in Puerto Rico and their control; 45 species of ants known to occur in the Island.

1924 *c*. Annual report of the division of entomology for the fiscal year 1922–23. Ins. Exp. Sta. P. R. Rept. for 1922–1923, pp. 51–57.

Notes on white grub and sugar cane mosaic transmission experiments; coffee shade tree insects and bees in coffee groves, banana root borer, tobacco leaf-miner, pink bollworm, cotton leaf-worm and on other cotton insects.

1924 *d*. Annual report of the division of entomology, fiscal year 1923–24. Ins. Exp. Sta. Rept. for 1923–24, pp. 88–103.

Notes on white grub control, on the coffee shade-tree ant and its control, on pink bollworm, banana root borer, termites and several other injurious insects.

1925 *a*. The comparative resistance of woods to the attack of the termite, *Cryptotermes brevis* Walker. Ins. Exp. Sta. P. R. Bul. **33**: 1–15.

A list of the different kinds of woods arranged in order of their comparative resistance to attack shows that cypress is absolutely resistant and mahogany somewhat less so.

1925 *b*. On the amount of food eaten by insects. Jour. Dept. Agr. P. R. **9**(1): 47–58.

Feeding experiments with several species of insects carried on in Puerto Rico.

1926. Notes on the insects of the sea-grape, *Coccoloba uvifera* (L.) Jacq. in Porto Rico and adjacent countries. Bul. Ent. Res. **17**(1): 49–52.

1927. Common insect pests prefer other host plants in Haiti. Jour. Econ. Ent. **20**(2): 429–430.

Systena basalis Duv. stated to be usually on tobacco in Puerto Rico but on cotton in Haiti and *Nezara viridula L.* but once recorded as damaging tobacco in Puerto Rico and observed also commonly in a field in Haiti altho it occurs mainly on cotton in the Lesser and on tomatoes and peppers in the Greater Antilles.

1928. The maybeetles of Haiti (Scarabeidae: Coleoptera). Proc. Ent. Soc. Wash. **30**(2): 21–29.

The abundance of *Phyllophaga* in Puerto Rico is referred to on page 21.

1929 *a*. The mystery of *Alabama argillacea*. Am. Nat. **63**. (684): 82–87.

"In the scattered cotton fields of Puerto Rico, *Alabama* sometimes appears in destructive numbers but in other years is not to be seen."

1929 *b*. Notes on the life history of *Exophthalmus quadrivittatus* Oliv. (Coleoptera). Proc. Ent. Soc. Wash. **31**(2): 21–26.

Mention of injuries by *Diaprepes* in Puerto Rico is made on page 21.

1929 *c*. Weather and the non-burning of trash in borer control in Porto Rico. Trans. 4th Int. Congress Ent. **2**: 62–64.

Extensive observations show that infestation by the sugar cane borer, *Diatraea saccharalis* Fab. is inversely proportional to the amount of rainfall and worse where the trash is burned due to destruction of parasites.

1931. The infestation of young okra pods by the pink bollworm in Porto Rico. Jour. Dept. Agr. P. R. **15**(4): 395–398.

1932 *a*. Insect conditions in Porto Rico during February, 1932. Ins. Pest Surv. Bul. **12**(2): 76, April 1.

1932 *b*. On methods of determining borer abundance in cane fields. Proc. Fourth Congress Int. Soc. Sugar Cane Techs. (Preprint Bul. **88**: 1–2), San Juan, P. R.

Experiments carried on in Puerto Rico are referred to.

1932 *c*. Insect conditions in Puerto Rico during July, 1932. Ins. Pest Surv. Bul. **12**(6): 293.

Notes on the cottony cushion scale and lima bean pod-borers.

1932 *d*. Insect conditions in Puerto Rico during August, 1932. Insect Pest Surv. Bul. **12**(7): 338, September 1.

A note is included on the status of the cottony cushion scale, *Icerya purchasi* Mask., as of the middle of August.

1932 *e*. The effect of the hurricane of San Cyprian on insects in Puerto Rico. Ins. Pest Surv. Bul. **12**(9): 409–410.

Some insects present in normal numbers and others reduced; notably among the latter is the cottony cushion scale, which however was undoubtedly considerably extended in its distribution.

Wolcott, G. N., More, J. D. and **Seín Jr., F.** 1921. La oruga rosada de la cápsula del algodón en Puerto Rico. Est. Exp.

Ins. P. R. Circ. 63, 12 pp., 3 figs. Reprinted under the same title in the Agricultor Puertorriqueño **11**(7) : 7–8, 28, 3 figs., 1921.

General account of the discovery, distribution life-history, and control of the pink bollworm of cotton in Puerto Rico.

Wolcott. G. N. and **Seín Jr., F.** 1921. La lapa del tabaco y otras siembras. Est. Exp. Ins. P. R. Circ. **51**.

General account of the damage and control of the slug, *Veronicella occidentalis* Guild. on tobacco and other crops in Puerto Rico.

Wolcott, G. N. and **Seín Jr., F.** 1922. Los caculos cornudos o los escarabajos rinocerontes de Puerto Rico. Est. Exp. Ins. P. R. Circ. **53** : 1–13, 4 pls.

Brief general account of *Strataegus quadrifoveatus* Beauv. and *S. titanus* Fab.

1931. La oruga rosada de la cápsula del algodón en Puerto Rico. Est. Exp. Ins. P. R. Circ. **95** : 1–13, 4 figs.

General account of the pink bollworm in Puerto Rico and suggested control measures.

APPENDIX

As a partial guide or index to this bibliography the following list of authors is given. The names are grouped largely under the orders of insects, altho several general subjects such as malaria, apiculture, and plant quarantine are included. Altho it will be found by turning to the references cited under these authors that the papers are mostly of a systematic nature, the names of authors of some of the more important economic papers have also been included, especially where a paper deals with a single species. Where no date follows an author's name it means that there is either only a single reference listed for that author or that all the references by that author deal with the group of insects or subject designated.

APICULTURE

Anonymous, 1928 *a*, 1928 *b*; Abad, J.R.; Baldorioty de Castro; **Brenner**; Colón, E. D., 1930: Cuevas Zequeira; Holmer & Little; **Iches**; Ledru; Phillips; Sein, 1923 *b*; Snyder, T. G.; Tower, 1911 *c*, **1912** *c*, 1920 *a*, 1921 *a*; Van Zwaluwenburg & Vidal; Vidal.

ARACHNIDA

Banks, 1901, 1917; Chamberlin, 1917, 1922 (millipedes), Cotton, **1917** *c*; Koch; Lutz; Petrunkevitch; Seely.

COLEOPTERA

Anonymous, 1932; Aube; Ballou, 1913, 1916; Baly; Barrow; **Blake**; Boheman; Bovel; Bryant; Catoni, 1932 *e*; Champion; Chapin; **Chapuis**; Chevrolat, L. A. A.; Chevrolat, M. A.; Clark, Hamlet; **Cotton**, 1917 *b*, 1918 *b*, 1918 *d*; Crespo, 1920; Danforth, R. E.; **Erichson**; Erichson in Germar; Fauvel; Fischer; Fisher; **Fletiaux**; Gahan, C. J.; Gerstaecher; Gómez; González Ríos, 1922; **Hutson**; Illiger; Jacoby; Jones, 1915 *c*; Kolbe, 1907, 1910; **Lacordaire**; Leng & Mutchler; Leonard, 1930 *b*, 1931 *c*; Leveille; **Lewis**; López Tuero; Mäklin; Marshall; Montgomery & Bragdon; **More**, 1921 *a*, *b*, *c*; Moser; Mutchler; Notman; Ochs; Pierce, 1915, **1918**; Quedenfeldt; Quintanilla; Reitter; Ritchie; Rivera; **Sasscer**, 1921, Sein, 1923 *c*, 1929, 1931 *b*, *c*; Sharp; Sicard; Smyth,

1917 *b*, 1918, 1920 *a*; Suffrian; Torres, 1927; Tower, 1923, 1924; Weise; Wolcott, A. B.; Wolcott, G. N., 1921 *b*, 1922 *c*, 1923 *a*, *b*, 1928, 1929 *b*; Wolcott & Seín, 1922.

DIPTERA

Aldrich; Alexander; Bigot; Bradt; Coquillett; Cresson Jr.; Curran; Dickmans, 1927 *a*; Dyar, 1907, 1924, 1928; Felt; Frost; González Ríos, 1923; Gundlach; Hoffman, 1925, 1927; Knab; Leonard & Sein, 1931; Loew; Macquart; Malloch; M. A. M.; Melander; Osten Sacken; Parker; von Roeder; Smyth, 1919 *h*, *i*. lander; Osten Sacken; Parker; von Roeder; Smyth, 1919 *h*, *i*; Wiedemann; Walton.

HEMIPTERA

Barber; Barber & Bruner; Cotton, 1917 *a*; Drake; Gundlach; Harris; Leonard, 1931 *b*, 1932 *c*; Leonard & Mills, 1931 *b*.

HOMOPTERA

Catoni, 1923 *d*; Cockerell, 1895; Cotton, 1917 *d*; Davis; Dozier, 1925, 1926 *b*, 1927 *a*, *b*, 1931; Fernald; Ferris; Funkhouser; Gibson; Gundlach; Hernández; Hottes & Frison; Jones, 1915 *a*, 1917 *a*; Leonard, 1930 *a*, 1932 *l*; Mari; Marlatt, 1908; McAtee; McClelland & Tucker; Menéndez Ramos; Morrison; Muir, 1918, 1924; Muir & Giffard; Osborn; Pergande & Cockerell; Quaintance; Quaintance & Baker; Sasscer, 1920; Teague; Wolcott 1922 *b*, 1932 *d*.

HYMENOPTERA

Ashmead; Barret, 1904; Berger, 1921; Bishoff; Cockerell, 1910, 1919; Crawford; Cresson; Dewitz, 1881; Díaz; Dodd; Dozier, 1926 *a*, *c*, 1932 *a*, *b*; Gahan, A. B.; Girault; Gundlach; Herrera; Hooker, 1912; Leonard, 1933 *b*; Mann; Muesebeck; Rohwer; Myers, 1931 *b*; Rohwer; Tower, 1908 *b*; Van Dine, 1913 *a*; Viereck; Wheeler; Wolcott, 1925 *a*.

ISOPTERA

Banks, 1919; Banks & Snyder; Crespo, 1919; Snyder, 1923, 1924; Wolcott, 1921 *a*, 1925 *a*.

LEPIDOPTERA

Aurivillius etc.; Box, 1931; Brown; Chittenden; Clark, B. Preston; Dewitz, 1877 *a*, *b*; Dyar 1922; Forbes; Forbes & Leonard; Gundlach; Hampson; Holloway; Holloway, Haley & Loftin; Holloway & Loftin; Jones, 1913, 1915 *b*, 1917 *b*; Jones & Wolcott; Klotz, A. B.; Langston; Lathy; Leonard & Mills, 1931 *a*; Leonard & Sein, 1932; Linnaeus; Medina; Mills & Leonard; Molinary Sales; More, 1931 *d*; Möschler; Pagenstecher; Pastor Rodríguez, 1931 *a*, *b*; Rothschild; Rothschild & Jordan; Saavedra; Schaufuss; Sein, 1926, 1929 *c*, *d*, 1930 *b*, *d*, *e*, 1931 *a*, 1932 *b*; Sepúlveda; Smyth, 1916, 1917 *a*, 1920 *c*; Torres, 1931; U.S.D.A., Fed. Hort. Bd. 1922; Van Zwaluwenburg, 1916 *b*; Vickery; Walsingham; Wolcott, 1915, 1921 *c*, 1922 *a*, *f*, *m*, *n*, 1923 *b*, 1929 *a*, *c*, 1931, 1932 *b*; Wolcott, More & Seín; Wolcott & Seín, 1931.

MALARIA (Including Mosquitoes)

Anonymous, 1925, 1926, 1927 *c*, *d*, 1928 *c*, 1929; Bastón; Earle; Earle & Arbona; Hoffman, Marin & Burke; Howard, Dyar & Knab; Dyar, 1907, 1924; Johnson; King; Kudo; Ludlow; McKinley; Sard; Saussure; Sein, 1923; Thomas; Van Zwaluwenburg, 1918 *c*.

NEUROPTERA

Gundlach; Kolbe, 1888.

ODONATA

Gundlach; Klotz, Elsie B.

ORTHOPTERA

Barrett, 1902; Brunner von Wattenwyl; Brunner von Wattenwyl & Redtenbacher; Burmeister; Caudell; Crossman & Wolcott; Dohrn; Gundlach; deHaan; Hebard; Moore; Rehn & Hebard; Saussure; Sein, 1923; Thomas; Van Zwaluwenburg, 1918 *c*.

PLANT QUARANTINE

Anonymous, 1911, 1913, 1915, 1920, 1921, 1923, 1924; Catoni, 1921 *i*, 1922 *d*, 1924; Crespo & Catoni; Faxon & Trotter; Smyth, 1919 *a*; Stevenson, 1918 *a*; U.S.D.A., Fed. Hort. Bd.; U.S.D.A., P.Q. & C.A.

SERICULTURE

del Campo; Sein, 1928; Colón, 1930.

SIPHONAPTERA

Carrión; Cox, Carrión & Fox; Dickmans, 1927 *b*.

STREPSIPTERA

Pierce, 1914.

THYSANOPTERA

Dozier, 1926 *d;* Hood; Leonard, 1932 *e;* Morgan; Russell; White.

THYSANURA AND COLLEMBOLA

Folsom; Sein, 1930, *b.*

VERTEBRATES (Birds, Toads & Lizzards)

Dexter; Anonymous, 1913 *a;* Danforth, S.T., 1926 Leonard, 1933 *a;* Rosenfeld, 1925 *a;* Sein 1927; Smyth, 1920 *b;* Wetmore; Wolcott, 1923 *d.*