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LELAND OSSIAN HOWARD

1857—1950

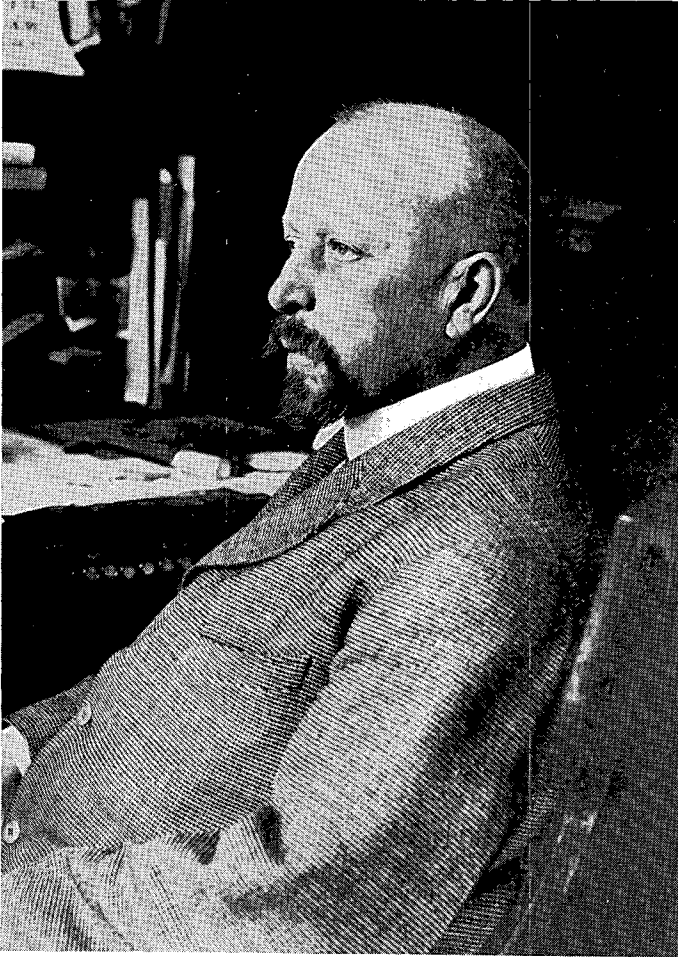
A Biographical Memoir by

JOHN E. GRAF AND DOROTHY W. GRAF

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Biographical Memoir

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L.O. Howard

LELAND OSSIAN HOWARD

June 11, 1857-May 1, 1950

BY JOHN E. GRAF AND DOROTHY W. GRAF

TO APPRECIATE THE ACCOMPLISHMENTS of Dr. Howard in his chosen profession, it is necessary to understand the period spanned by his lifetime. In his youth the dramatic and all-conquering march of the potato beetle from the eastern foothills of the Rockies to the Atlantic was still fresh in memory. The first salaried entomologist of the United States Government was appointed in 1854. The science of entomology developed slowly, and when Dr. Howard came to Washington in 1878 there were few trained investigators, little was known of the biology of insects, and control measures were most rudimentary. Nor could much useful information be secured from abroad. During his active career, the nation suffered losses from the so-called Rocky Mountain locust and from invasions of such serious pests of foreign origin as the boll weevil, gypsy moth, Japanese beetle, and the European corn borer. It was a period during which it was necessary to dramatize the importance of economic entomology to make the general public appreciate the seriousness of the problem, and at the same time to develop a wide-flung program of research so that damage from insects could be held to a minimum and crop and animal production made profitable, to insure a greatly expanded agriculture for our rapidly growing country. The problem called for a man of many talents, and fortunately Dr. Leland Ossian Howard was selected for the position of responsibility.

FAMILY HISTORY

Dr. Howard was born in Rockford, Illinois, June 11, 1857, while his mother and father were there on a short stay. His father was Ossian Gregory Howard, a lawyer by profession, and his mother was the former Lucy Dunham Thurber, a singer and teacher of both voice and piano. Both parents had grown up in the town of Delhi, in Delaware County, New York. His paternal grandfather was Dr. Calvin Howard, an old-fashioned country physician, who was admitted to practice about 1817, and who in 1846 was given the honorary degree of Doctor in Medicine by the Columbian Medical College, Washington, D. C. (a strange coincidence being that the same honorary degree was given to his grandson by the same institution, which had changed its name to the Medical College of George Washington University, sixty-five years later). He was instrumental in forming in Delhi, in 1833, The Chemical and Geological Society, afterwards known as The Lyceum of Natural History. Dr. Howard's great-grandmother on his mother's side was Lois Pickering of the remarkable Pickering family of Salem, Massachusetts, to which belonged many distinguished men in science and other walks of life, one of the best known being Timothy Pickering, one of the signers of the Declaration of Independence. Lois Pickering was very advanced for the period in which she lived, extremely independent, and quite a character. She and Abner Thurber eloped and she rode pillion behind him all the way from Salem to the wilds of New York state, where they settled in the small colony which afterwards became Cooperstown. There she later taught school and had as one of her pupils young James Fenimore Cooper. The son of the Thurbers, also named Abner, married Lucy Dunham, of *Mayflower* descent, and they moved to Delhi, where they had a farm and brought up a large family of children, the youngest daughter being Dr. Howard's mother. His grandfather Thurber was not only a farmer and a "hatter," but also an ardent amateur astronomer and something of a poet and a mystic. All of his children were taught to sing

and to love beauty. He was a deacon in the Presbyterian church and his farm was a known station on the Underground Railroad for escaping slaves. His wife, Lucy Dunham, was practical, hard-working, and rather puritanical.

Among Dr. Howard's ancestors on both sides are found lawyers, physicians, clergymen, and farmers with strong leanings to the professions. Other relatives were General Oliver O. Howard, a well-known officer of the Civil War; U. S. Senator Jacob M. Howard of Michigan, who is credited with writing the first platform of the Republican party; Senator Howard's son, James Leland Howard, a former lieutenant governor of Connecticut; Alphonso Taft, a member of President Grant's cabinet, and Henry L. Stimson, Secretary of War under President Taft.

YOUTH

When he was less than a year old, Dr. Howard's parents moved to Ithaca, New York, then a village of seven or eight thousand inhabitants. There his father began to practice law.

The life of the village was very simple in those days, emphasis being put on church affairs, and little outside entertainment was available except for an occasional traveling circus. The Howard family were great readers, who subscribed to the *Atlantic Monthly*, *Harper's Magazine*, and the *New York Tribune*, and read all the better novels as they appeared. Dr. Howard learned to read at a very early age, and also to play whist, so that he could make a fourth when needed.

When he was about six or seven he went on a visit to Long Island where he met some boys who were collecting cocoons. He became interested at once and began his collection of insects, which he continued for fourteen years. His enthusiasm stirred the interest of some of his boy friends and they formed The Ithaca Natural History Society, of which Howard was the first president. There is a photograph of the group, showing him as the only one with a hat, which he said was worn to show that he held this high office.

He swam and boated on Cayuga Lake, camped frequently in the woods, and led the normal boy's life in spite of the very puritanical attitude of his grandmother, who made him promise at an early age that he would never learn to dance. She promised that if he agreed, and also would never join a secret society, she would give him a hundred dollars. Apparently the promises were not too difficult to keep and he got his hundred dollars.

He was very fond of singing, and after his father's death, he used to escort his mother to church, where she was the leading soprano, and if any special part of the choir were missing, he would oblige by singing tenor, baritone, or bass, as needed. When he grew up and came to Washington, he joined the Choral Society, and it was there he first saw the girl who later became his wife.

EDUCATION

Howard first attended a private primary school, then he went to the public schools, and later to the Ithaca Academy. He studied for a year in a private school in Ithaca, and then entered Cornell University, which had been established in Ithaca when he was ten years old. While at Cornell, he came in contact with many nonresident lecturers, including such prominent men as Bayard Taylor, James Russell Lowell, and Louis Agassiz. In the University he was attracted strongly to the whole field of natural history. He continued collecting insects throughout his college career and undertook special studies in the Department of Invertebrate Zoology, spending much time in the laboratory of Professor J. H. Comstock. He also maintained his intense interest in outdoor sports, playing football and baseball, and rowing in one or two crews, though he never gained high rank in college athletics. He graduated from Cornell in 1877 with the degree of Bachelor of Science, afterwards taking one post-graduate course. Four years later he was awarded the degree of M. S. on submittal of a thesis, and taking a special examination in advanced botany.

PROFESSIONAL CAREER

In 1878 Dr. Howard received the appointment of assistant entomologist in the Department of Agriculture. He remained the first assistant entomologist until June, 1894, when he was made chief entomologist, a position which he held until 1927. At that time he requested that he be relieved of administrative responsibility. He then became principal entomologist, in which position he was able to devote full time to those scientific activities in which he was pre-eminent. He retired from government service in 1931 after fifty-three years of service. In 1904 he was made consulting entomologist of the Public Health and Marine Hospital Service, now the U. S. Public Health Service. In 1919 he was senior entomologist with the grade of senior surgeon, U. S. Public Health Service.

At the beginning his office was located in the old brick Department of Agriculture building in Washington at the foot of 13th Street. In those days the staff of the division was very small, and a considerable portion of the work was devoted to answering inquiries. Dr. Howard, however, was greatly interested in insect parasites, and did a great deal of taxonomic work on the parasitic Hymenoptera. As assistant to Dr. Riley, the chief entomologist, his duties were many and varied. Important among them were preparing or assisting in preparing entomological material for publication in the department bulletins and assisting in the editing of *Insect Life*. When Professor Riley resigned to head the U. S. Entomological Commission for a two-year period, Dr. Howard again was able to renew his association with Professor Comstock and his wife, and with William Trelease, the entomologist and botanist, a friendship which made for a happy social as well as professional life. Of this period he writes, "We were filled with the enthusiasm of youth, worked hard, and were delighted with the interesting and important discoveries we made." Dr. Howard gradually took a more important part in the writing of articles, preparing many of these himself, and finally became the editor of *Insect Life*. He was appointed chief of the Divi-

sion of Entomology in 1894 upon the resignation of Dr. Riley. By that time this division, while still small, had grown in prestige, and entomological problems were becoming more and more important as the destructiveness of native pests was recognized and foreign pests invaded the country. The boll weevil had crossed our southern border into the cotton belt of Texas, and the gypsy moth and San José scale which had gained entrance into this country somewhat earlier were recognized as serious insect pests.

The total appropriation for the Division of Entomology when Dr. Howard assumed its leadership was \$30,000, but after the public became conscious of the importance of the study of economic entomology, appropriations increased rapidly and the organization grew with the increase in funds. The Division of Entomology was made a bureau in 1904, adding greatly to Dr. Howard's administrative duties. He still found time, however, to carry on his research work, with emphasis on the parasites of scale insects. All told he described 47 new genera and 272 new species of insects, not including 22 species of mosquitoes credited to him and other workers.

His taxonomic work on parasites greatly increased his interest in their economic utilization, and he was one of the early leaders in the field of biological control of insect pests. This led to the importation of parasites and predators from foreign countries and their colonization here. His work on the parasites of the gypsy and brown-tailed moths is still one of the classics dealing with this subject.

Dr. Howard had taken a premedical course at Cornell, and this led naturally to night school medical studies at the old Columbian University, now George Washington University. His great interest and very considerable knowledge in the fields of entomology and medicine led to a combination of these two disciplines in the field of medical entomology. It was not long before he was a recognized authority on the subject, and important contributions to this field resulted in no small part from his ability to dramatize the subject. The slogan "Swat the Fly" caught the public fancy and resulted in anti-fly campaigns around the world. His publication, *The House*

Fly—Disease Carrier, removed the house fly permanently from the role it hitherto held in childhood stories. He not only called attention to the danger of house flies as disease carriers, but pointed out that the best control was the elimination of breeding places, a remedy which still holds high rank in spite of numerous insecticides which have been developed since his day. He also played an important role in the crusade against mosquitoes.

In like manner, Dr. Howard has dramatized the war between man and insects, and has brought home to people both in this country and abroad the importance of this never ending conflict.

Throughout his professional career Dr. Howard traveled widely. While many of these trips were made specifically for the purpose of arranging for the collection and introduction of foreign parasites, Dr. Howard had the valuable knack of making and holding friends, by means of which he established happy, cooperative relations with the leading entomologists of Europe, a most important factor in the international development of the science of economic entomology.

He recognized the importance of keeping abreast of the literature in his field and was a student throughout his life. He was in the library of the Department of Agriculture almost daily and scanned the current publications, including those which were not the object of his special study. He gave strong support to the librarians and must be given much credit for the excellent library service provided for the professional staff.

Having served four years beyond the normal retirement age, he left the Government service on June 30, 1931, at the age of seventy-four years. He had seen the Division of Entomology grow from an office with an annual appropriation of \$30,000 in 1894, when he became the chief entomologist, to a large and important bureau when he retired as chief in 1927, with appropriations of \$3,000,000, and a wide-flung group of research laboratories in this country and abroad.

In addition to his professional position as chief of the Bureau of Entomology, he was honorary curator of the Division of Insects in the United States National Museum for life, an honor he greatly

appreciated; chairman, Subcommittee on Medical Entomology, National Research Council; consulting entomologist, U. S. Public Health Service; and member of the Committee on Agriculture, National Council of Defense.

In Washington, Dr. Howard was able to find time to pursue his love for outdoor life and sports. In his early days he was a member of the Capitol Bicycle Club and took many long trips on the old "ordinary" bicycles. He was well-known as a racer.

RELATED ACTIVITIES

Dr. Howard took significant and active part in the activities of two groups which played an important role in the development of science in America. The first of these was the American Association for the Advancement of Science, an organization of which he was secretary of Section F in 1893; vice-president and chairman of the same section in 1895 and 1897; and in 1898 was elected permanent secretary, a position he held for twenty-two years. In 1920 he was elected president. The second of these groups was the Cosmos Club, of which he was secretary from 1894 to 1907, president in 1909, and, in addition, held other offices. The Cosmos Club was really his second home. The positions he held there naturally required his frequent presence at the Club but he went there daily because he liked those who made up its membership and was at ease when he was with them whether having a lively discussion of some subject of importance or enjoying a pleasant game of billiards or cowboy pool. Dr. Howard was also an excellent bridge player. In all the games he played he possessed not only a high degree of skill but strong competitive spirit. As a result of his long service as secretary of the Cosmos Club and permanent secretary of the American Association for the Advancement of Science, he undoubtedly knew more American and European scientists than any one of his generation. He was at his best as an ambassador of science, whether at home or abroad.

He was also greatly interested in international scientific meetings

and in the international congresses of entomology and zoology he always took a prominent part.

HIS FAMILY

In 1886 Dr. Howard was married to Miss Marie Theodora Clifton. Her family came originally from Baltimore, but moved to Washington when she was a child. Her father's family was very musical, her grandfather having been a teacher, violinist, and composer, and one of her aunts a well-known singer in both Baltimore and Washington. One of her grandfather's compositions was the march played at the opening of the Baltimore and Ohio Railroad, which was written especially for that occasion. Mrs. Howard had a very beautiful voice herself, and for some years before her marriage was leading soprano at St. Matthew's Church.

The early years of their married life were spent in a house in Georgetown where their three daughters, Lucy Thurber Howard, Candace Leland Howard, and Janet Moore Howard, were all born. There they spent their winters, going to the Catskill Mountains in the summer, to a pleasant summer colony founded by Dr. Howard's uncle, Mr. Francis B. Thurber of New York, and his aunt, Mrs. Candace Wheeler. During his active life, Dr. Howard was able to spend but little time there, but when there on vacation, he was able to study in a leisurely fashion the habits of some of his insect friends. Later, when he had more time, he spent pleasant hours on the golf course.

His family life was very happy. He was no disciplinarian, leaving that chore to his wife, except for an occasional word of warning. But as his daughters grew up they found in him a most delightful companion, who revealed to them the joys of the books he had read and loved.

Mrs. Howard died in 1926, and in 1933 his daughter Candace, who had been married in 1925 to Edward de Mille Payne of New York, died at the birth of her only child, a boy who was named after his grandfather, Leland Howard Payne.

PRINCIPAL ACCOMPLISHMENTS

Opinions may vary as to the relative importance of the fields which held Dr. Howard's interest, but it seems clear that, from the standpoint of permanent contributions to science, he will be remembered (1) for his taxonomic work on parasitic insects, (2) for his part in the encouragement of biological control of insects, (3) for the early stimulus he gave to the subject of medical entomology, (4) for his foreign contacts in economic entomology, and (5) for his leadership in portraying the insect problem.

Since the introduction of parasites for the control of insect pests, this work has expanded and attained increasing importance, in spite of recent developments of many new insecticides. Several spectacular successes and others in which partial control is effected give ample proof that biological control will continue to gain support as an important contribution to insect control.

In the early days of medical entomology, Dr. Howard demonstrated that entomologists had an important place in the investigation and control of insect-borne diseases. This has contributed in an important measure to the steady growth of medical entomology, both in the promotion of general public health and in the protection of military personnel.

Dr. Howard's part in making economic entomology truly international through his foreign contacts and his participation in international meetings and congresses may be shown by quoting from a statement made by the British scientist, R. Stewart MacDougall, on the occasion of the Third International Congress of Entomology in Zurich. "A special tribute must be paid to Dr. L. O. Howard, of the United States Department of Entomology. Always in a position to help and using his position to help, Dr. Howard has earned the gratitude of entomologists everywhere. Capable and kindly, always with the right word, and with tact as his middle name, Howard gives one the feeling that were there a dozen representative ambassadors like him in the political world, we would soon have what some

of us long for, the United States of Europe, each nation no longer at enmity with the other but working out its own salvation following the lines of its own culture and psychology. Certainly there was a spirit of friendliness and goodwill at the Congress, attesting that science has no limited boundaries but is international."

Dr. Howard led the move to point out the losses insects caused to man's health, his food, and his home. In so doing he obtained sufficient support not only to advance the science of entomology but to greatly accelerate the research on injurious insects. In this effort he went directly to the people and used methods which would drive him to his objective, whether it was speeches or popular articles in farm periodicals, magazines of wide circulation, or newspapers. That this crusade was successful is shown by the steady and continuing growth of the Bureau of Entomology. This is probably his greatest contribution to science, for it served to multiple his own efforts many fold.

PERSONAL QUALITIES

Of his father, Dr. Howard has noted, "He was brilliant, was a great raconteur, and had a biting wit." These qualities Dr. Howard inherited, since he had a brilliant mind, was an excellent raconteur and speaker, had a keen sense of humor, and, on those occasions when he felt the circumstances justified biting wit, could use it. As a speaker, he cared little whether his audience was composed of children or adults, scientists or laymen. He liked all people and he charmed them. As an administrator, he was not a driver but preferred to select the right man for the job and then provide encouragement and support. He disliked contention and always sought to resolve differences without dispute. At an early period he had surrounded himself with a group of principal advisers, including C. L. Marlatt, his first assistant, A. L. Quaintance, and W. D. Hunter. With this "cabinet" supporting the chief the Bureau of Entomology did not lack for sound administrative guidance on a high level.

Modesty always characterized his endeavors. In writing of his ac-

accomplishments in the fiftieth anniversary book compiled by the class of 1877 of Cornell University, he says: "Circumstances have conspired to emphasize the importance of economic entomology, and a great service has been built up through the munificence of Congress and the cordial help and appreciation of very many helpfully appreciative people all over the country. I have been especially interested, aside from the general field of economic entomology, in parasitism among insects, and in the comparatively new field of medical entomology. I have written several books and about eight hundred lesser papers, and, largely owing to the sound and important work done by my assistants and associates, have, as the chief of the service, received many honorary memberships in foreign academies and societies, several honorary degrees, and that sort of thing" (*Cornellian Council Bulletin*, March, 1931).

"I have made no especial discoveries" (from Dr. Howard's papers deposited with the National Academy of Sciences).

On the occasion of a visit to the Whittier, California, citrus insect laboratory, after listening to Mr. R. S. Woglum describe his research in the control of citrus insects, he turned to his traveling companion, Dr. Marchal, the distinguished French entomologist, and said, "You can see from the fine work of these men that it is an easy task to be chief of the Bureau of Entomology."

When he was asked to what outstanding accomplishment the Capper Medal and Award might be attributed he said he did not know, but that the real credit belonged to his aides.

These modest sentiments show why the men who served under Dr. Howard will always remember with gratitude his generosity in recognizing their contributions.

His friends will always remember him for his tireless industry in driving towards his goal, his affectionate regard for his family and friends, his keen sense of humor, and his interest in people generally, whether at work or play.

HONORS

Dr. Howard received several honorary degrees, including Honorary Ph.D., Georgetown University, 1896; Honorary M.D., George Washington University, 1911; L.L.D., University of Pittsburgh, 1911; L.L.D., University of California, 1929; Sc.D., University of Toronto, 1920; Sc.D., Rutgers University, 1930. He was a trustee of Cornell University, 1900-1905.

Probably one of his greatest thrills came to Dr. Howard in 1931 when he was the recipient of the Capper Award, consisting of a gold medal and a cash award of \$5,000. Other high honors were: Chevalier de la Légion d'Honneur, France; Officier de la Légion d'Honneur, France; Officier de l'Ordre du Merite Agricole, France; Gold Medal, Italian Ministry of Agriculture (Al Merito Agricola); Gold medal, Holland Society of New York; Buffon Medal, Museum d'Histoire Naturelle, Paris; 1st medalist, New York Farmer.

As might be expected of one who was deeply interested in spreading the knowledge of economic entomology around the world, Dr. Howard attended a number of international congresses as well as other foreign conferences in which the United States had special interest. He was a delegate, International Congress of Agriculture, Vienna, 1907; chairman, Washington section International Congress of Zoology, Washington, 1907; delegate, Lamarck Centenary Fete, Paris, 1903; delegate, Darwin Centenary Celebration, Cambridge, England, 1908; chairman, section of Economic Entomology, 2nd International Congress of Entomology, Oxford, England, 1912; Honorary President, International Congress of Phytopathologists and Economic Entomologists, Wageningen, Holland, 1923; vice-president, International Congress of Agriculture, Paris, 1923; delegate, Olive Fly Conference, Madrid, 1923; chairman, Pan-Pacific Conservation Conference, Honolulu, 1924; chairman, general session, 3rd International Entomological Congress; Zurich, 1925; delegate, International Congress of Agriculture, Warsaw, 1925; president, section of Economic Zoology, International Congress of Zool-

ogy, Budapest, 1927; president, Fourth International Congress of Entomology, Ithaca, N. Y., August, 1928; honorary member, V Congrès International d'Entomologie, Paris, 1932.

Dr. Howard was proud of his close friendships with the entomologists of many foreign countries. His standing in this regard was shown by his election to honorary membership in foreign societies, most of which were scientific and all of which had high qualifications. He was an honorary member of the Entomologiska Foreningen in Stockholm; Trinidad Field Naturalists Club; Sociedad científica "Antonio Alzate," Mexico; Ontario Entomological Society; Real Liga Agraria do Norte, Portugal; Allgemeines Entomologische Gesellschaft, Germany; Entomological Society of Ontario; Entomological Society of the Northwest Provinces; Société Entomologique de France; Association of Economic Biologists of Great Britain; Société Nationale d'Acclimation de France; Society for the Destruction of Vermin, London; Deutsche Gesellschaft für Angewandte Entomologie; South African Biological Society; Société Scientifique du Chile; Société Entomologique de la Russie; Sociedad de Estudios Biologicos, Mexico; Entomological Society of Moscow; Scientific Council Board of the Russian Bureau of Entomology; Société d'Etude et de Vulgarisation de la Zoologie Agricole, France; Academie Chilena de Ciencias Naturales; Sociedad Chilena de Historia Natural; Czechoslovak Academy of Agriculture; Société Linnéenne de Bordeaux; corresponding member, Institut National Genevois, Switzerland; correspondent, Museum d'Histoire Naturelle, Paris; member, Commission International d'Agriculture; Académie d'Agriculture de France; fellow, Entomological Society of London, England; foreign correspondent, Real Academia de Ciencias y Artes de Barcelona; colaborador de la Dirección de Estudios Biologicos, Mexico; corresponding member, Zoological Society of London; Entomological Society of Chile.

Dr. Howard was a member or honorary member of many American scientific societies. These include National Academy of Sciences; American Philosophical Society; American Academy of Arts and

Sciences (Fellow); American Association for the Advancement of Science (Permanent Secretary 1898-1920, President, 1920); Entomological Society of America (Fellow); Member American Institute of Social Sciences; Washington Academy of Science (President, 1916); Academy of Natural Sciences of Philadelphia (Correspondent); American Entomological Society (Corresponding member); Staten Island Association of Arts and Sciences (Corresponding member); American Association of Economic Entomologists (President, 1894); Entomological Society of Washington (President and Honorary President); Honorary member California Academy of Sciences; Davenport Academy of Natural Sciences; American Society of Tropical Medicine; Entomological Society of Albany; Harris Club of Boston; New Jersey Mosquito Extermination Association; Louisiana Entomological Society; Maryland Academy of Sciences; New York Entomological Society; Brooklyn Entomological Society; Entomological Society of America (Honorary Fellow); Honorary chairman, National Malaria Committee (1925).

This impressive list of honors received and membership in scientific groups is ample evidence of the high esteem in which Dr. Howard was held in cultural and scientific circles abroad as well as in this country.

LAST YEARS

The last years of Dr. Howard's life were spent very quietly. He had moved away from Washington at the beginning of the Second World War and spent the last eight years of his life in one of the suburbs of New York City. He had been physically incapacitated by a fall, but he was mentally keen and active to within a very short time of his death. He read the scientific papers and journals with great interest, and kept in as close touch as he could with the work of the Bureau of Entomology and international entomology. His correspondence with friends and colleagues all over the world was a joy to him. He must have missed Washington and his work greatly,

but he never spoke of it or complained. He died peacefully within a month of his ninety-third birthday, on May 1, 1950.

No more accurate summary could be made to the great contributions of this eminent scientist and scholar and dynamic crusader than to quote from the obituary by Dr. F. C. Bishopp: "On May 1, 1950, the long and brilliant career of Leland Ossian Howard, the world's most outstanding entomologist, came to an end. But the impact of his contributions as a research worker, writer, educator, and administrator will continue to be felt all over the globe for many years to come."

Dr. Howard's daughter, Miss Lucy T. Howard, kindly read the manuscript and rewrote and added materially to the sections "Family History," "Youth," and "His Family," and wrote "Last Years." The clippings, papers, and bibliography maintained over many years by the late Misses Mabel Colcord and Ina Hawes, formerly librarians of the Bureau of Entomology, were of great assistance. Mrs. Ann Campbell of the Smithsonian Institution contributed materially to the arrangement and editing of the biography.

KEY TO ABBREVIATIONS

- Amer. Assoc. Adv. Sci. Proc.=American Association for the Advancement of Science Proceedings
 Amer. Ent. Soc. Trans.=American Entomological Society Transactions
 Amer. Jour. Pub. Health=American Journal of Public Health
 Amer. Nat.=American Naturalist
 Amer. Pomol. Soc. Proc.=American Pomological Society Proceedings
 Argentina Min. Agr. Bol.=Argentina Ministerio de Agricultura Boletin
 Can. Ent.=Canadian Entomologist
 Carnegie Inst. Wash. Pub.=Carnegie Institution of Washington Publication
 Carolina Med. Jour.=Carolina Medical Journal
 Centbl. f. Bakt., Parasitenk. u. Infektionskrank., Abdruck=Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, Abdruck
 Chem. Age=Chemical Age
 Country Gent.=Country Gentleman
 Eng. News-Rec.=Engineering News-Record
 Ent. Amer.=Entomologica Americana
 Ent. News=Entomological News
 Ent. Soc. Amer. Ann.=Entomological Society of America Annals
 Ent. Soc. Ontario Ann. Rept.=Entomological Society of Ontario Annual Report
 Hawaiian Ent. Soc. Proc.=Hawaiian Entomological Society Proceedings
 Inter. Cong. Ent. Proc.=International Congress of Entomology Proceedings
 Internatl. Conf. Phytopath. Econ. Ent. Rept.=International Conference of Phytopathology and Economic Entomology Report
 Internatl. Zool. Cong. Proc.=International Zoological Congress Proceedings
 Jour. Econ. Ent.=Journal of Economic Entomology
 Linn. Soc. London Jour. Zool.=Linnean Society of London Journal of Zoology
 Mass. State Forest. Ann. Rept.=Massachusetts State Forester, Annual Report
 Md. Acad. Sci. Jour.=Maryland Academy of Sciences Journal
 Mich. State Hort. Soc. Ann. Rept.=Michigan State Horticultural Society Annual Report.
 Natl. Acad. Sci. Proc.=National Academy of Science Proceedings
 Natl. Geog. Mag.=National Geographic Magazine
 N. J. Mosquito Exter. Assoc. Proc.=New Jersey Mosquito Extermination Association Proceedings
 N. Y. Med. Jour.=New York Medical Journal
 Pop. Sci. Monthly=Popular Science Monthly
 Rev. Chilena Hist. Nat.=Revista Chilena de Historia Natural
 Rev. Rev.=Review of Reviews
 Royal Ent. Soc. London Proc.=Royal Entomological Society of London Proceedings
 Sci. Amer.=Scientific American

- Sci. Monthly = Scientific Monthly
 Smithsonian Misc. Coll. = Smithsonian Miscellaneous Collections
 Soc. Ent. France Bull. = Société Entomologique de France Bulletin
 Soc. Natl. d'Acclim. de France Bull. = Société National d'Acclimation de France Bulletin
 U. S. Com. Agr. Rept. = U. S. Commissioner of Agriculture Report
 U. S. Dept. Agr. Div. Ent. Bull. = U. S. Department of Agriculture Division of Entomology Bulletin
 U. S. Dept. Agr. Div. Ent. Cir. = U. S. Department of Agriculture Division of Entomology Circular
 U. S. Dept. Agr. Div. Ent. Tech. Bull. = U. S. Department of Agriculture Division of Entomology Technical Bulletin
 U. S. Dept. Agr. Div. Ent. Tech. Ser. = U. S. Department of Agriculture Division of Entomology Technical Series
 U. S. Dept. Agr. Farmers' Bull. = U. S. Department of Agriculture Farmers' Bulletin
 U. S. Dept. Agr. Rept. = U. S. Department of Agriculture Report
 U. S. Dept. Agr. Sec. Off. Cir. = U. S. Department of Agriculture Secretary's Office Circular
 U. S. Dept. Agr. Yearbook = U. S. Department of Agriculture Yearbook
 U. S. Natl. Mus. Proc. = U. S. National Museum Proceedings
 U. S. Pub. Health Serv. Repts. = United States Public Health Service Reports
 Wash. Acad. Sci. Jour. = Washington Academy of Sciences Journal
 Wash. Acad. Sci. Proc. = Washington Academy of Sciences Proceedings
 Wash. Biol. Soc. Proc. = Washington Biological Society Proceedings
 Wash. Ent. Soc. Proc. = Washington Entomological Society Proceedings
 Wyo. State Bd. Health Bien. Rept. = Wyoming State Board of Health Biennial Report

SELECTED BIBLIOGRAPHY

The following list of approximately 400 titles is selected from a bibliography of over 1,000 titles prepared by the Librarians of the U. S. Department of Agriculture, Bureau of Entomology. Many of these papers have been reprinted, abstracted, or otherwise reproduced widely in this country as well as in Europe, Canada, and several countries in Central and South America. Attempts were made to eliminate such duplicate entries, even though they show the great respect in which Dr. Howard was held outside his own country.

1879

- Parasites on the Clover-seed Midge, (*Eurytoma funebris n. sp.*). U. S. Com. Agr. Rept., 1879, pp. 196-97.
 The Army Worm. Moore's Rural Life, 1:56-57, figs. [on *Lachnosterna fusca*]. Can. Ent., 11:200.

1880

A New Silk-Spinning Chalcid. Can. Ent., 12:158-59.

Two New Species of *Eupelmus*, with Remarks on *E. (Antigaster) mirabilis*, Walsh. Can. Ent., 12:207-10.

1881

Report on the Parasites of the Coccidae in the Collection of This Department. U. S. Com. Agr. Rept., 1880, pp. 350-71, 2 plates.

Additional Notes on the Genus *Antigaster* of Walsh. Can. Ent., 13:31-33, 3 figs.

1882

Some Curious Methods of Chalcid Pupation. Amer. Nat., 16:60-62; 149-51.

Effect of Pyrethrum upon the Heart-beat of *Plusia brassicae*. Amer. Nat., 16:1015.

Alternate Generation in Cynipidae. Psyche, 3:328-29.

Curious Habits of *Metapodius femoratus*. Amer. Nat., 16:597-98.

Dorsal Locomotion with *Allorhina nitida*. Amer. Nat., 16:411.

1883

Report of Observations upon the Army Worm, 1881. U. S. Com. Agr. Rept., 1881 and 1882, pp. 97-99.

The Rice Stalk Borer (*Chilo oryzaeellus* Riley). U. S. Com. Agr. Rept., 1881 and 1882, pp. 133-35.

White Blast [of rice]. U. S. Com. Agr. Rept., 1881 and 1882, pp. 136-37.

The Rice Grub (*Chalepus trachypygus* Burm.). U. S. Com. Agr. Rept., 1881 and 1882, pp. 128-29, illus.

The Water Weevil (*Lissorhoptrus simplex* Say). U. S. Com. Agr. Rept., 1881 and 1882, pp. 130-33, illus.

The Corn Bill-bug (*Sphenophorus robustus* Horn). U. S. Com. Agr. Rept., 1881 and 1882, pp. 138-42, illus.

Experiments with Pyrethrum. U. S. Dept. Agr. Div. Ent. Bull., 3:16-23.

1884

Pachyneuron Altiscuta. Mich. State Hort. Soc. Ann. Rept., 1884, p. 91.

Museum Pests of Service to the Entomologist. Psyche, 4:132.

1885

On the Parasites of *Odontota Suturalis*. Ent. Amer., 1:117-18.

Descriptions of North American Chalcididae from the Collections of the U. S. Department of Agriculture. U. S. Dept. Agr. Div. Ent. Bull. 5. 47 pp.

1886

The Excessive Voracity of the Female Mantis. Science, 8:326.

A Generic Synopsis of the Hymenopterous Family Proctotrupidae. Amer. Ent. Soc. Trans., 13:169-78.

A Remarkable Swarm of *Sciara*. Science, 8:102.

Mistaken Parasite, *Platygaster error* Fitch. Wash. Ent. Soc. Proc., 1:10.

A Generic Synopsis of the Hymenopterous Family Chalcididae. Ent. Amer., 1:197-99, 215-19; 2:33-38; 5:97-101.

Buffalo Carpet Beetle. Sci. Amer., 55:35.

1887

The Life of the Hop Plant-louse. Country Gent., 52:875.

A Contribution to the Study of the Morphology of the Chalcididae. Wash. Ent. Soc. Proc., 2: 65-74.

A Note on the European Parasites and Food-plants of *Cryptorhynchus lapathi*. Ent. Amer., 3:159-60.

[Larva of *Hydropsyche* Feeding on Larvae of *Simulium*.] U. S. Dept. Agr. Rept., 1886, p. 510.

1888

The Yellow-spotted Willow-slug. Insect Life, 1:33-37, fig.

The Chalcid Genus *Rileyia*. Can. Ent., 20:191-95, fig.

The Codling Moth (*Carpocapsa pomonella* L.) U. S. Com. Agr. Rept., 1887, pp. 88-115, 1 col. pl.

The Chinch Bug: a General Summary of Its History, Habits, Enemies, and of the Remedies and Preventives To Be Used Against It. U. S. Dept. Agr. Div. Ent. Bull. 17. 48 pp., 10 figs.

The Chinch Bug, (*Blissus leucopterus* Say). U. S. Dept. Agr. Rept., 1887, pp. 51-88, 1 col. pl.

The Peach-twig Moth and Its Parasites. Insect Life, 1:196-97.

Further concerning External Spider Parasites. Insect Life, 1:106-7, 1 fig.

Notes on *Simulium* Common at Ithaca, N. Y. Insect Life, 1:99-101.

Discussion of W. H. Ashmead's paper on "A Proposed Natural Arrangement of the Hymenopterous Families." Wash. Ent. Soc. Proc., 1:99-100.

- On *Encyrtus montinus* Pack. Wash. Ent. Soc. Proc., 1:91-92.
 Heat Evolved from the Work of a Bruchus. Insect Life, 1:59-60.
 External Spider Parasites. Insect Life, 1:42-43.
Epicauta cinerea Attracted by Light. Wash. Ent. Soc. Proc., 1:50.
 The Chinch Bug in 1888. Insect Life, 1:31-32.
 The Sugar-cane Beetle Injuring Corn. Insect Life, 1:11-13.
 Notes a Remarkable Case of Muscular Force Exhibited in a Specimen of
Canthon (Probably *vigilans*). Wash. Ent. Soc. Proc., 1:50.

1889

- The Rabbit Grub. Sci. Amer., 61:133.
 The Hymenopterous Parasites of North American Butterflies. In: *Butterflies of the Eastern United States and Canada with Special Reference to New England*, by Samuel Hubbard Scudder (Cambridge, Mass. Published by the author), 3:1869-1911, 2 pls.
 A Newly-imported Elm Insect. Insect Life, 2:34-41, 5 figs.
 A Parasite of the Supposed Eggs of the Cotton Stainer. Insect Life, 1:241-42.
 A Commencement of a Study of the Parasites of the Cosmopolitan Insects. Wash. Ent. Soc. Proc., 1:118-35.

1890

- With C. V. Riley. The Phylloxera Problem Abroad as It Appears Today. Insect Life, 2:310-11.
 Irrigation and Injurious Insects. Insect Life, 2:215-22.
 A Brief Consideration of Certain Points in the Morphology of the Family Chalcididae. Wash. Ent. Soc. Proc., 1:65-74.
 A New and Remarkable Encyrtid: Is It Parasitic? Insect Life, 3:145-48, 1 fig.
 With C. V. Riley. Some of the Bred Parasitic Hymenoptera in the National Collection. Insect Life, 3:57-61.
 A North American *Axima* and Its Habits. Insect Life, 2:365-67, 3 figs.
 With C. V. Riley. Anthrax Parasitic on Cut-worms. Insect Life, 2:353-54, 1 fig.
 With C. V. Riley. Some of the Bred Parasitic Hymenoptera, in the National Collection. Insect Life, 2:348-53.
 Two Spider-egg Parasites. Insect Life, 2:269-71, 2 figs.
 With C. V. Riley. Two Parasites of the Garden Web-worm. Insect Life, 2:327-28, 1 fig.

- Some New Parasites of the Grain Plant Louse. *Insect Life*, 2:246-48, 3 figs.
 European Parasites of *Ocneria dispar*. *Wash. Ent. Soc. Proc.*, 1:264.
 With C. V. Riley. The Imported Gipsy Moth (*Ocneria dispar* L.). *Insect Life*, 2:208-11, 2 figs.
 Note on the Mouth-parts of the American Cockroach. *Wash. Ent. Soc. Proc.*, 1:216-18.
 A Few Additions and Corrections to Scudder's *Nomenclator Zoölogicus*. *Wash. Ent. Soc. Proc.*, 1:258-59.
 Note on the Hairy Eyes of Some Hymenoptera. *Wash. Ent. Soc. Proc.*, 1:195-96.

1891

- With C. V. Riley. Some of the Bred Parasitic Hymenoptera in the National Collection. *Insect Life*, 3:460-64.
 A New Remarkable Genus of Encyrtinae. *Wash. Ent. Soc. Proc.*, 2:84-85.
 With C. V. Riley. Experiments with a Date-palm Scale. *Insect Life*, 3:441-43.
 The Biology of the Hymenopterous Insects of the Family Chalcididae. *U. S. Natl. Mus. Proc.*, 14:567-88.
 A Note on Parasites. *Insect Life*, 4:48-49.
 The Methods of Pupation among the Chalcididae. *Insect Life*, 4:193-96, 2 figs.
 The Host Relations of Parasitic Hymenoptera. *Insect Life*, 3:277-79.
 The Parasites of the Hemerobiinae. *Wash. Ent. Soc. Proc.*, 2:123-24.
 The Habits of Pachyneuron. *Wash. Ent. Soc. Proc.*, 2:105-9.
 The Habits of *Eurytoma*. *Wash. Ent. Soc. Proc.*, 2:66-67.
 The Larger Corn Stalk Borer. *Insect Life*, 4:95-103, 3 figs.

1892

- Insects of the Subfamily Encyrtinae with Branched Antennae. *U. S. Natl. Mus. Proc.*, 15:361-69, 2 pls.
 With C. V. Riley. The Pea and Bean Weevils. *Insect Life*, 4:297-302, 2 figs.
 With C. V. Riley. The Potato Tuber Moth (*Lita Solanella* Boisd.). *Insect Life*, 4:239-42, 1 fig.
 A New Enemy to Timothy Grass. *Insect Life*, 5:90-92, 2 figs.
 An Experiment against Mosquitoes. *Insect Life*, 5:12-14.
 A New *Icerya* Parasite. *Insect Life*, 4:378-79.
 The Hymenopterous Parasites of Spiders. *Wash. Ent. Soc. Proc.*, 2:290-302, 1 pl.

- The Habits of *Melittobia*. Wash. Ent. Soc. Proc., 2:244-48.
 The Habits of *Elasmus*. Insect Life, 4:253-54, 1 fig.
 With C. V. Riley. A Genus of Mantis Egg-parasites. Insect Life, 4:242-45,
 2 figs.
 Note on the Hibernation of Carpenter Bees. Wash. Ent. Soc. Proc., 2:331.
 Appearance of Mealy Bugs Parasitized by *Leptomastix*. Wash. Ent. Soc.
 Proc., 2:237.
 A Note on the Parasites of the Coccidæ. Wash. Ent. Soc. Proc., 2:351-52.

1893

- With C. V. Riley. Parthenogenesis among Spiders. Insect Life, 6:42-43.
 With C. V. Riley. Spider Mimicry. Insect Life, 6:38-39.
 With C. V. Riley. The Bud Moth. Insect Life, 5:293-94.
 Another Mosquito Experiment. Insect Life, 6:90-91.
 [Note on the phytophagic habit of *Megastigmus strobilobius* Ratz.] Wash.
 Ent. Soc. Proc., 2:363-64.
 With C. V. Riley. Another "Blood-sucking" Cone-nose. Insect Life, 6:
 52-53.
 With C. V. Riley. The Colorado Potato Beetle in Nova Scotia. Insect Life,
 6:47-48.
 With C. V. Riley. The Sweet Potato Weevil in Jamaica. Insect Life, 6:
 43-44.
 With C. V. Riley. The Plum Curculio in Door County, Wis. Insect Life,
 6:37-38.
 With C. V. Riley. Destructive Locusts in Colorado. Insect Life, 6:32-33.
 With C. V. Riley. An Important Predatory Insect (*Erastria scitula* Ram-
 bur.). Insect Life, 6:6-10.
 With C. V. Riley. Imported Beneficial Insects. Insect Life, 6:5
 With C. V. Riley. The Present Year's Appearances of the Periodical
 Cicada. Insect Life, 5:298-300.
 With C. V. Riley. Borers in Fig Trees. Insect Life, 5:365-66.
 With C. V. Riley. An Enemy of the Oyster-shell Bark-louse of the Apple.
 Insect Life, 5:362.
 The Angoumois Grain Moth or "Fly Weevil." Insect Life, 5:325-28.
 With C. V. Riley. The Sugar-beet Web Worm (*Loxostege sticticalis* L.).
 Insect Life, 5:320-22, 2 figs.
 With C. V. Riley. The Cattle Tick. Insect Life, 5:294-95.
 An Important Enemy to Fruit Trees; the San José Scale; Its appearance
 in the Eastern United States; Measures To Be Taken To Prevent Its

- Spread and To Destroy It. U. S. Dept. Agr. Div. Ent. Cir., 3, second ser. 10 pp., 5 figs.
- Insects of the Subfamily Encyrtinae with Branched Antennae. U. S. Natl. Mus. Proc., 15:361-69.
- 1894
- With C. V. Riley. A New and Destructive Peach-tree Scale. Insect Life, 6:287-301.
- On the Geographical Distribution of Some Common Scale Insects. Can. Ent., 26:353-56.
- Some Rearings of Parasites. Insect Life, 7:280.
- An Important Scale on Cottonwood. Insect Life, 7:275-76.
- A New Cotton Insect in Texas. Insect Life, 7:273.
- Two More Important Vedalias. Insect Life, 7:271.
- A New Pear Insect. Insect Life, 7:258-60, 1 fig.
- A New Parasite of *Mytilaspis pomorum*. Insect Life, 7:256.
- Damage by the American Locust. Insect Life, 7:220-29, 4 figs.
- The Eastern Occurrences of the San José Scale. Insect Life, 7:153-63.
- A Brief Account of the Rise and Present Condition of Official Economic Entomology. Insect Life, 7:55-107.
- The Horn Fly Attacking Horses. Insect Life, 7:54.
- Resin Wash against the Grape Aspidiotus. Insect Life, 7:53.
- The Grape-vine Root-worm. Insect Life, 7:48.
- The Black Australian Ladybird in California. Insect Life, 7:48.
- A New Apple-tree Enemy. Insect Life, 7:47-48, 1 fig.
- Two Parasites of Imported Scale Insects. Insect Life, 7:5-8, 2 figs.
- Completed Life-history of the Sugar-beet Web-worm. Insect Life, 6:369-73, 2 figs.
- The Carpet Beetle, or "Buffalo Moth" (*Anthrenus scrophulariae* L.). U. S. Dept. Agr. Div. Ent. Cir. 5, second ser. 4 pp., 1 fig.
- The Army Worm (*Leucania unipuncta* Haw.). U. S. Dept. Agr. Div. Ent. Cir. 4, second ser. 5 pp., 3 figs.
- El Picudo ó Gorgogo Mexicano de la Capsula del Algodon (*Anthonomus grandis* Boh.). Departamento de Agricultura de los Estados Unidos, Division de Entomologia. 11 pp., 5 figs.
- The Hymenopterous Parasites of the California Red Scale. Insect Life, 6:227-36, 6 figs.
- Report on the Chalcididae of the Subfamilies Chalcidinae, Eucharinae, Perilampinae, Encyrtinae, and Elachistinae [of the Island of St. Vincent]. Linn. Soc. London Jour. Zool., 25:79-108.

- With C. V. Riley. Evolution of the Wings of Insects. *Insect Life*, 6:272-73.
 The Spider Which Bites. *Insect Life*, 7:276.
 Scorpions, Centipedes, and Tarantulas. *Insect Life*, 7:260-63.
 The Maple Pseudococcus. *Insect Life*, 7:235-40, 2 figs.
 A Peculiar Structural Feature of the Elasmidae. *Wash. Ent. Soc. Proc.*,
 3:13-14.

1895

- Cutworms and the Armyworm Habit. *Insect Life*, 7:415-16.
 [Discussion on Homology of Mouth Parts.] *Wash. Ent. Soc. Proc.*, 3:
 249-50.
 Arrhenophagus in America. *Wash. Ent. Soc. Proc.*, 3:239-40.
 The Imported Parasite of the Hessian Fly. *Insect Life*, 7:356, 1 fig.
 An Ortalid Fly Injuring Growing Cereals. *Insect Life*, 7:352-54.
 Notes on the Geographical Distribution within the United States of Cer-
 tain Insects Injuring Cultivated Crops. *Wash. Ent. Soc. Proc.*, 3:219-26.
 Injurious Insects and Commerce. *Insect Life*, 7:332-38.
 Further Notes on the San José Scale. *Insect Life*, 7:283-95.
 Note on the Mouth Parts of *Stenopelmatus*. *Wash. Ent. Soc. Proc.*, 3:
 102-3.
 A Newly Imported Scale Insect. *Insect Life*, 7:426-27.
 Note on the Chicken Tick (*Argas americanus* Pack). *Insect Life*, 7:
 417-18.
 Migration of the Great Plains Cricket. *Insect Life*, 7:417.
 Apparent Success of One of the Hessian Fly Parasite Importations. *Insect*
Life, 7:414-15.
 An Injurious Parasite. *Insect Life*, 7:402-04.
 The Beet-leaf Pegomyia. *Insect Life*, 7:379-81, 1 fig.
 A New Genus and Species in the Aphelininae. *Can. Ent.*, 27:350-51.
 On the Bothriothoracine Insects of the United States. *U. S. Natl. Mus.*
Proc., 17:605-13.
 The Mexican Cotton-boll Weevil. *U. S. Dept. Agr. Div. Ent. Cir.* 6, second
 ser. 5 pp., 3 figs.
 The Harlequin Cabbage Bug, or Calico Back (*Murgantia histrionica*
 Hahn.). *U. S. Dept. Agr. Div. Ent. Cir.* 10, second ser. 2 pp., 1 fig.
 Some Scale Insects of the Orchard. *U. S. Dept. Agr. Yearbook*, 1894,
 pp. 249-76, 2 figs.
 Revision of the Aphelininae of North America, a Subfamily of Hymenop-
 terous Parasites of the Family Chalcididae. *U. S. Dept. Agr. Div. Ent.*
Tech. Bull. 1. 44 pp., 14 figs.

1896

- The Grass and Grain Joint-worm Flies and Their Allies: a Consideration of Some North American Phytophagic Eurytominae. U. S. Dept. Agr. Div. Ent. Tech. Ser. No. 2. 24 pp., 10 figs.
- With C. L. Marlatt. House Flies, Centipedes, and Other Insects that Are Annoying Rather than Directly Injurious. U. S. Dept. Agr. Div. Ent. Bull. 4, new ser., pp. 43-57, 10 figs.
- Some Insects Affecting Cheese, Hams, Fruit and Vinegar. U. S. Dept. Agr. Div. Ent. Bull. 4, new ser., pp. 100-111, 6 figs.
- With C. L. Marlatt. Species Injurious to Woolen Goods, Clothing, Carpets, Upholstery, etc. U. S. Dept. Agr. Div. Ent. Bull. 4, new ser., pp. 58-69, 5 figs.
- With C. L. Marlatt. The San José Scale: Its Occurrences in the United States, with Full Account of Its Life History and the Remedies To Be Used against It. U. S. Dept. Agr. Div. Ent. Bull. 3, new ser. 80 pp., 8 figs.
- With W. H. Ashmead. On Some Reared Parasitic Hymenopterous Insects from Ceylon. U. S. Natl. Mus. Proc., 18:633-48.
- Specimens of *Margarodes* from South Africa. Wash. Ent. Soc. Proc., 4: 33-34.
- Some Temperature Effects on Household Insects. U. S. Dept. Agr. Div. Ent. Bull., 6:13-17.
- The Larger Corn Stalk-borer (*Diatraea saccharalis* Fab.). U. S. Dept. Agr. Div. Ent. Cir. 16, second ser. 3 pp., 3 figs.
- On Two Interesting New Genera of Scale Insect Parasites. Can. Ent., 28:165-67.
- General Work against Insects Which Defoliate Shade Trees in Cities and Towns. U. S. Dept. Agr. Div. Ent. Cir. 15, second ser. 4 pp.
- Mosquitoes and Fleas. U. S. Dept. Agr. Div. Ent. Cir. 13, second ser. 4 pp.
- The Insects Which Affect the Cotton Plant in the United States. U. S. Dept. Agr. Off. Expt. Stas. Bull., 33:317-50, 1 pl., 29 figs.
- A Coleopterous Enemy of *Corydalis cornutus*. Wash. Ent. Soc. Proc., 3: 310-13.

1897

- Insects Affecting the Cotton Plant. U. S. Dept. Agr. Farmers' Bull. 47. 31 pp., 1 pl., 18 figs.
- Mosquitoes and Fleas. U. S. Dept. Agr. Div. Ent. Cir. 13, Rev. ed. 4 pp.
- The Gipsy Moth in America. U. S. Dept. Agr. Div. Ent. Bull. 11, new ser. 39 pp., 8 figs.

- A Gall-making Coccid in America. U. S. Dept. Agr. Div. Ent. Bull. 7, new ser., pp. 76-77, 1 fig.
- The Spread of Land species by the Agency of Man; with Special Reference to Insects. Science, n.s., 6:382-98.
- On the Chalcididae of the Island of Grenada, B.W.I. Linn. Soc. London Jour. Zool., 26:129-78.
- A Study in Insect Parasitism: A Consideration of the Parasites of the White-marked Tussock-moth, with an Account of Their Habits and Interrelations, and with Descriptions of New Species. U. S. Dept. Agr. Div. Ent. Tech. Ser. 5. 57 pp., illus.

1898

- A New Egg Parasite of the Periodical Cicada (*Lathromeris cicadae* n.sp.). Can. Ent., 30:102-3.
- Another Lead-boring Insect. U. S. Dept. Agr. Div. Ent. Bull. 10, new ser., pp. 88-89.
- The Gipsy Moth in America: a Summary Account of the Introduction and Spread of *Porthetria dispar* in Massachusetts and of the Efforts made by the State To Repress and Exterminate It. U. S. Dept. Agr. Div. Ent. Bull. 11, new ser. 39 pp., 8 figs.
- Pulvinaria acericola* (W. & R.) and *P. innumerabilis* Rathv. U. S. Dept. Agr. Div. Ent. Bull. 17, pp. 57-58, 1 fig.
- Two Beneficial Insects Introduced from Europe. U. S. Dept. Agr. Div. Ent. Bull. 17, new ser., pp. 13-16, 2 figs.
- Cotton Field Insects. U. S. Dept. Agr. Div. Ent. Bull. 18, new ser., pp. 85-89.
- House Flies (*Musca domestica et al.*). U. S. Dept. Agr. Div. Ent. Cir. 35, second ser. 8 pp., 6 figs.
- Further Notes on the House Fly. U. S. Dept. Agr. Div. Ent. Bull. 10, new ser., pp. 63-65.
- The Fig-eater, or Green June Beetle (*Allorhina nitida* Linn). U. S. Dept. Agr. Div. Ent. Bull. 10, new ser., pp. 20-26, 1 fig.
- On Some Parasites of Coccidae, with Descriptions of Two New Genera of Aphelininae. Wash. Ent. Soc. Proc., 4:133-39.
- A New Parasite of the Harlequin Cabbage Bug. Can. Ent., 30:17-18.

1899

- On Some New Parasitic Insects of the Subfamily Encyrtinae. U. S. Natl. Mus. Proc., 21:231-48.

- The Present Status of the Caprifig Experiments in California. U. S. Dept. Agr. Div. Ent. Bull. 20, new ser., pp. 28-35.
- With C. L. Marlatt. The Original Home of the San José Scale. U. S. Dept. Agr. Div. Ent. Bull. 20, new ser., pp. 36-39.
- Butterflies Attracted to Light at Night. Wash. Ent. Soc. Proc., 4:333-34.
- A Dipterous Parasite of Lachnosterna. Wash. Ent. Soc. Proc., 4:198-99.
- An Insect Breeding in Crude Petroleum. Sci. Amer., 80:75-76, 1 fig.
- The Economic Status of Insects as a Class. Science, n.s., 9:233-47.
- Three Insect Enemies of Shade Trees. U. S. Dept. Agr. Farmers' Bull. 99, 30 pp., 11 figs.

1900

- The Present Status of the Caprifig Experiments in California. Amer. Pomol. Soc. Proc., 1899, pp. 27-32.
- Beneficial work of *Hyperaspis signata*, Oliv.). U. S. Dept. Agr. Div. Ent. Bull. 26, new ser., pp. 17-18, 1 fig.
- Establishment of a New Beneficial Insect in California. U. S. Dept. Agr. Div. Ent. Bull. 26, new ser., pp. 16-17.
- A Contribution to the Study of the Insect Fauna of Human Excrement. [With especial reference to the spread of typhoid fever by flies.] Wash. Acad. Sci. Proc., 2:541-604, 2 pls., 22 figs.
- Flies and Typhoid Fever. Pop. Sci. Monthly, 58:249-56, 11 figs.
- Remarks on *Psorophora ciliata* Fabr., with notes on Its Early Stages. Can. Ent., 32:353-57, 3 figs.
- Notes on the Mosquitoes of the United States, Giving Some Account of Their Structure and Biology, with Remarks on Remedies. U. S. Dept. Agr. Div. Ent. Bull. 25, new ser. 70 pp., 22 figs.
- The Difference between Malarial and Non-malarial Mosquitoes. Sci. Amer., 83:8-9, 1 pl.
- Progress in Economic Entomology in the United States. U. S. Dept. Agr. Yearbook, 1899, pp. 135-56, 1 pl.
- A New Genus of Aphelininae from Chile. Can. Ent., 32:167-68.
- The Two Most Abundant Pulvinarias on Maple. U. S. Dept. Agr. Div. Ent. Bull. 22, new ser., pp. 7-23, 17 figs.
- A New Western Enemy of the Colorado Potato Beetle. U. S. Dept. Agr. Div. Ent. Bull. 22, new ser., pp. 102-3.
- The Principal Insects Affecting the Tobacco Plant. U. S. Dept. Agr. Farmers' Bull. 120, 32 pp., 25 figs.

- How To Distinguish the Different Mosquitoes of North America. U. S. Dept. Agr. Div. Ent. Cir. 40, second ser. 7 pp., 3 figs.
 An Interesting Case of the Use of Insects as Food. Sci. Amer., 82:71.

1901

- The Insect Book. New York, Doubleday, Page and Co. 429 pp., 16 col pls., 32 plain pls., 264 figs.
 Mosquitoes; How They Live, How They Carry Disease, How They Are Classified and How They May Be Destroyed. New York, McClure, Phillips & Co. 241 pp., 1 pl., 50 figs.
 On Some Diptera Bred from Cow-manure. Can. Ent., 33:42-44.
 [The Attitude of the State toward Scientific Investigation.] Science, n.s., 13:87-91.
 Mosquitoes as Transmitters of Disease. Rev. Rev., 24:192-95.
 On the Alleged Immunity of Redwood to Attack by Termites. U. S. Dept. Agr. Div. Ent. Bull. 30, new ser., pp. 95-96.
 Efficiency of the Two-spotted Ladybird as a Plant-louse Destroyer. U. S. Dept. Agr. Div. Ent. Bull. 30, new ser., p. 90.
 The Angoumois Moth in Pennsylvania. U. S. Dept. Agr. Div. Ent. Bull. 30, new ser., pp. 86-87.
 On the Habits of *Entilia sinuata*. U. S. Dept. Agr. Div. Ent. Bull. 30, new ser., pp. 75-78, 2 figs.
 The Carriage of Disease by Flies. U. S. Dept. Agr. Div. Ent. Bull. 30, new ser., pp. 39-45, 6 figs.
 Singular Instances of Attack on Human Beings by Insects. U. S. Dept. Agr. Div. Ent. Bull. 30, new ser., p. 90.
 Insects as Carriers and Spreaders of Disease. U. S. Dept. Agr. Yearbook, 1901, pp. 177-92, 16 figs.
 Flies and Typhoid Fever. Pop. Sci. Monthly, 58:249-56, 11 figs.

1902

- A Western Cricket in Oregon. U. S. Dept. Agr. Div. Ent. Bull. 38, new ser., pp. 107-8.
 A New Genus of Aphelininae from Chile. Rev. Chilena Hist. Nat., 6: 172-73.
 How Insects Affect Health in Rural Districts. U. S. Dept. Agr. Farmers' Bull. 155, pp. 1-20, 16 figs.
 Hydrocyanic-acid Gas against House-hold Insects. U. S. Dept. Agr. Div. Ent. Cir. 46, second ser., pp. 1-4.

- Experimental Work with Fungous Diseases of Grasshoppers. U. S. Dept. Agr. Yearbook, 1901, pp. 459-70, 2 figs.
 Insects as Carriers and Spreaders of Disease. U. S. Dept. Agr. Yearbook, 1901, pp. 177-92, 16 figs.
 Hibernation of Mosquitoes (Abstract). Carolina Med. Jour., 48:211.

1903

- [The Status of the Chalcid Parasite *Syntomosphyrum esurus* Riley.] Wash. Ent. Soc. Proc., 5:138-39.
 [Concerning Parasitism of Ants by *Eucharidae*.] Wash. Ent. Soc. Proc., 5:96.
 The Transmission of Yellow Fever by Mosquitoes. Ent. Soc. Ontario Ann. Rept., 1903, pp. 26-30.
 Concerning the Geographic Distribution of the Yellow Fever Mosquito. U. S. Pub. Health Serv. Repts., 18:46.

1904

- The United States Department of Agriculture and Silk Culture. U. S. Dept. Agr. Yearbook, 1903, pp. 137-48, 5 pls.
 On Remedies for Garden Snails. U. S. Dept. Agr. Div. Ent. Bull. 44, new ser., pp. 96-97.
 Lights against the Imported Cabbage Webworm. U. S. Dept. Agr. Div. Ent. Bull. 44, new ser., p. 93.
Agonoderus pallipes, a Permanent Enemy of Sprouting Corn. U. S. Dept. Agr. Div. Ent. Bull. 44, new ser., p. 90.
 The World Wide Crusade. First Anti-Mosquito Convention, Brooklyn, N. Y. pp. 19-21.
 Anthrenus Destroying Tussock Moth Eggs. U. S. Dept. Agr. Div. Ent. Bull. 44, new ser., pp. 90-91.

1905

- Stegomyia* and Yellow Fever. Science, n.s., 22:526-27.
 Breeding Beneficial Insects. Science, n.s., 22:467-68.
 Insectos que en los Estados Atacan la Planta del Algódón. Argentina Min. Agr. Bol., 3:397-434.
 Introduction des Parasites du Bombyx Disparate et du Bombyx Chrysorrha aux Etats-Unis. Soc. Ent. France Bull., 14:197-99.
 Les Principaux Insectes Nuisibles Importes d'Europe aux Etats-Unis. Soc. Ent. France Bull., 16:231-33.

1906

- House Flies. U. S. Dept. Agr. Bur. Ent. Cir. 71. 9 pp., 8 figs.
 True Parasites of the San José Scale. U. S. Dept. Agr. Bur. Ent. Bull. 62, pp. 58-62, 3 figs.
 On the Parasites of *Diaspis Pentagona*. Ent. News, 17:291-93, 1 fig.
 Importations of the Gypsy Moth and Brown-tail Moth Parasites from Europe. Science, n.s., 24:296.
 The Gypsy and Brown-tail Moths and Their European Parasites. U. S. Dept. Agr. Yearbook, 1905, pp. 123-38, 8 figs.
 An Interesting New Genus and Species of Encyrtidae. Ent. News, 17: 121-22.
 The Brown-tail Moth and How To Control It. U. S. Dept. Agr. Farmers' Bull. 264, 22 pp., 10 figs.

1907

- With F. H. Chittenden. The Catalpa Sphinx (*Ceratonia catalpae* Bdv.). U. S. Dept. Agr. Bur. Ent. Cir. 96. 7 pp., 2 figs.
 The Gypsy Moth and How To Control It. U. S. Dept. Agr. Farmers' Bull. 275. 22 pp., 7 figs.
 The Recent Progress and Present Conditions of Economic Entomology. Science, n.s., 26:769-91.
 A Chalcidid Parasite of a Tick. Ent. News, 18:375-78, 1 pl., 1 fig.
 New Genera and Species of Alphelininae, with a Revised Table of Genera. U. S. Dept. Agr. Bur. Ent. Tech. Ser., 12, pt. 4, pp. 69-88, 10 figs.
 The Male of *Comperiella*. Ent. News, 18:237.
 A New Canadian Species of *Copidosoma*. Can. Ent., 39:102-3.
 Importation of the Gypsy Moth and Brown-tail Parasites from Europe. Amer. Assoc. Adv. Sci. Proc., 56:278-79.
 Mosquitoes. In: Osler's *Modern Medicine* (Philadelphia, Lea Bros. and Co.), Vol. 1, Chapter 18, pp. 370-91, 15 figs.

1908

- The Importation of *Tetrastichus xanthomelaenae* (Rond.). Jour. Econ. Ent., 1:281-89, 1 fig.
 A Suggestion Regarding Development Retarded by Parasitism. Can. Ent., 40:34-35.
 Another Chalcidoid parasite of a tick. Can. Ent., 40:239-41, 1 fig.
 Upon the Aphis-feeding Species of *Aphelinus*. Ent. News, 19:365-67.

The Carpet Beetle, or "Buffalo Moth" (*Anthrenus scrophulariae* L.). U. S.

Dept. Agr. Div. Ent. Cir. 5. 4 pp., 1 fig.

[New Species and Genera of Aphelininae.] Wash. Ent. Soc. Proc., 9:27-28.

A New Genus and Species of Mymaridae. Wash. Ent. Soc. Proc., 10:68-70.

On Two New Species of Parasites of Aleyrodidae. Wash. Ent. Soc. Proc.,
10:63-65.

With F. H. Chittenden. The Bag-worm (*Thyridopteryx ephemeraeformis*
How.). U. S. Dept. Agr. Bur. Ent. Cir. 97, 10 pp., 11 figs.

Mosquito Extermination. N. Y. Med. Jour., 87:760-61.

A Key to the Species of Prospaltella, with Table of Hosts and Descriptions
of 4 New Species. Ent. Soc. Amer. Ann., 1:281-84.

1909

With F. H. Chittenden. The Green-striped Maple Worm (*Anisota rubi-
cunda* Fab.). U. S. Dept. Agr. Bur. Ent. Cir. 110. 7 pp., 3 figs.

With F. H. Chittenden. The Leopard Moth (*Zeuzera pyrina* Fab.). U. S.
Dept. Agr. Bur. Ent. Cir. 109, second ser. 8 pp., 2 figs.

House Fleas. U. S. Dept. Agr. Bur. Ent. Cir. 108. 4 pp., 2 figs.

Economic Loss to the People of the United States through Insects that
Carry Disease. U. S. Dept. Agr. Bur. Ent. Bull. 78. 40 pp.

The Typhoid Fly or House Fly: A Dangerous Common Insect. Sci. Amer.
Sup., 67:274-75.

Present Condition of the Work Connected with the Importation of the
Foreign Parasites of the Gipsy Moth and the Brown-tail Moth. Ent.
Soc. Ontario Ann. Rept., 1908, pp. 121-24.

Importation du *Tetrastichus xanthomelaenae* Rond. aux Etats-Unis. Soc.
Natl. d'Acclim. de France Bull., 56:228-39, 1 fig.

1910

Preventive and Remedial Work against Mosquitoes. U. S. Dept. Agr. Bur.
Ent. Bull. 88. 126 pp.

[*Campylenchia curvata* with Host Plant.] Wash. Ent. Soc. Proc., 12:70-71,
1 fig.

On the Habit with Certain Chalcidoidea of Feeding at Puncture Holes
Made by the Ovipositor. Jour. Econ. Ent., 3:257-60.

Two New Aphelinine Parasites of Scale Insects. Ent. News, 21:162-63.

The Parasites Reared or Supposed to Have Been Reared from the Eggs of
the Gipsy Moth. U. S. Dept. Agr. Bur. Ent. Tech. Ser. 19, pt. 1. 12 pp.,
7 figs.

1911

- The Seventeen-year Locust or Periodical Cicada. The Two Races and When They Appear. *Sci. Amer.*, 104:524-25, 8 figs.
- Remedies and Preventives against Mosquitoes. U. S. Dept. Agr. Farmers' Bull. 444. 15 pp.
- A new Species of *Coccophagus* with a Table of the Host Relations of These Species of the Genus Known to the Writer. *Jour. Econ. Ent.*, 4:276-77.
- A Note on the Indian Enemies of *Aleyrodes citri* R. & H., with Description of a New Species of *Prospaltella*. *Jour. Econ. Ent.*, 4:130-32.
- The House Fly—Disease Carrier: An Account of Its Dangerous Activities and of the Means of Destroying It. New York, F. A. Stokes Co. 312 pp., 40 figs., 1 col. pl.
- Some Facts about Malaria. U. S. Dept. Agr. Farmers' Bull. 450. 13 pp.
- House Flies. U. S. Dept. Agr. Farmers' Bull. 459. 16 pp., 9 figs.
- With W. F. Fiske. The Importation into the United States of the Parasites of the Gipsy Moth and the Brown-tail Moth: A Report of Progress with Some Consideration of Previous and Concurrent Efforts of This Kind. U. S. Dept. Agr. Bur. Ent., Bull. 91. 312 pp., 74 figs., 28 pls.
- The Menacing Mosquito. *Country Life*, 20:29-30, 7 figs.

1912

- Simulium and Pellagra. U. S. Dept. Agr. Rept., 1911, p. 524.
- The Recent Progress and Present Conditions of Economic Entomology. 7th Internat. Zool. Cong. Proc., pp. 572-600.
- With C. H. Popenoe. Hydrocyanic Acid Gas against Household Insects. U. S. Dept. Agr. Bur. Ent. Cir. 163. 8 pp.
- With H. G. Dyar and Frederick Knab. The Mosquitoes of North and Central America and the West Indies. Carnegie Inst. Wash. Pub. 159. Vol. 1, 520 pp., 14 pls., 5 figs.; Vol. 2, 150 pls.

1913

- The Yellow-fever Mosquito. U. S. Dept. Agr. Bur. Ent. Farmers' Bull. 547, 16 pp., 6 figs.

1914

- The Carpet Beetle, or "Buffalo Moth" (*Anthrenus scrophulariae* L.). U. S. Dept. Agr. Bur. Ent. Farmers' Bull. 626. 4 pp.
- Explorers of a New Kind. *Nat. Geog. Mag.*, 26:38-67, 4 col. pls., 10 figs.

Concerning Some Aphelininae. Wash. Ent. Soc. Proc., 16:79-85, 1 fig.
An Incident in the Search for Foreign Gipsy Moth Parasites. Jour. Econ.
Ent., 7:378-82.

1915

With H. G. Dyar and Frederick Knab. The Mosquitoes of North and
Central America and the West Indies. Carnegie Inst. Wash. Pub. 159.
Vol. 3, 523 pp.
The House-fly, Carrier of Disease. Ohio State Bd. of Health. 16 pp., 11 figs.
With R. H. Hutchison. House Flies. U. S. Dept. Agr. Farmers' Bull. 679.
22 pp., 15 figs.
The Edibility of Insects. Jour. Econ. Ent., 8:549.
Hydrocyanic-acid Gas against Household Insects. U. S. Dept. Agr. Farm-
ers' Bull. 699. 8 pp.
On Possible Poisoning of Insectivorous Birds in the War against the Gipsy
Moth. Wash. Ent. Soc. Proc., 17:2.
The House-fly, Carrier of Disease. Wyo. State Bd. of Health, 2nd. Bien.
Rept., 1913-1914, pp. 16-26.

1916

Lachnosterna Larvae as a Possible Food Supply. Jour. Econ. Ent., 9:
389-92.
With W. D. Pierce. Important Insects Which May Affect the Health of
Man or Animals Engaged in Military Operations. U. S. Dept. Agr. Sec.
Off. Cir. 61. 24 pp., illus.
Further Notes on *Prospaltella berlesei* How. Jour. Econ. Ent., 9:179-81.
On the Hawaiian Work in Introducing Beneficial Insects. Jour. Econ.
Ent., 9:172-79.
[The Cluster Fly (*Pollenia rudis*).] Wash. Acad. Sci. Jour., 6:78-79.
With F. H. Chittenden. The Catalpa Sphinx. U. S. Dept. Agr. Farmers'
Bull. 705. 9 pp., 5 figs.
With F. H. Chittenden. The Leopard Moth: A Dangerous Imported In-
sect Enemy of Shade Trees. U. S. Dept. Agr. Farmers' Bull. 708. 12 pp.,
4 figs.
With F. H. Chittenden. The Bagworm, an Injurious Shade-tree Insect.
U. S. Dept. Agr. Farmers' Bull. 701. 12 pp., 13 figs.

1917

With H. G. Dyar and Frederick Knab. The Mosquitoes of North and
Central America and the West Indies. Carnegie Inst. Wash. Pub. 159.
Vol. 4, pp. 525-1064.

- The Relation of Insects to Disease in Man and Animals. Ent. Soc. Ontario Ann. Rept., 1916, pp. 57-62.
- A Second Importation of the European Egg-parasite of the Elm Leaf-beetle. Jour. Econ. Ent., 10:504-5.
- The Carriage of Disease by Insects. Wash. Acad. Sci. Jour., 7:217-22.
- Entomology as a National Defense. Ent. News, 28:229.
- A New Aphis-feeding Aphelinus. Wash. Biol. Soc. Proc., 30:77.
- The Practical Use of the Insect Enemies of Injurious Insects. U. S. Dept. Agr. Yearbook, 1916, pp. 273-88.

1918

- Report on Parasites. Mass. State Forest. Ann. Rept., 14:45-46.
- The House Fly—Carrier of Disease. Issued by the Ohio State Bd. of Health, Columbus, Ohio. 16 pp., 11 figs.
- A Note on Insects Found on Snow at High Elevations. Ent. News, 29:375-77.
- The Contribution of Zoology to Human Welfare. Science, n.s., 47:349-54.
- The Jerusalem Artichoke as a War Plant. Science, n.s., 47:344.
- An Unusual Bumblebee's Nest. Ent. News, 29:114-15.
- Moonstones in a Cecropia Cocoon. Ent. News, 29:15-16.

1919

- On the Hymenopterous Parasites of Kermes. (Homop., Coccidae). Ent. News, 30:255-59.
- Entomology and the War. Sci. Monthly, 8:109-17.
- Two New Instances of Polyembryony among the Encyrtidae. Science, n.s., 44:43-44.
- Note on the Vinegarone. Ent. News, 30:26.

1920

- Swarming of Anopheles. Science, n.s., 52:468-69.
- Mosquitoes and Bats. U. S. Pub. Health Serv. Repts., 35:1789-95.
- Efforts at Mosquito Control in Different Parts of the World. N. J. Mosquito Exter. Assoc., 7th annual meeting, Proc., pp. 16-28.

1921

- On Some Presidential Addresses: The War against Insects. Address of the President of the American Association for the Advancement of Science, Toronto, 1921. Science, n.s., 54:641-51.

[Report on Cooperation with European Entomologists.] Jour. Econ. Ent., 14:17.

A Fifty-year Sketch History of Medical Entomology and Its Relation to Public Health. In: *A Half Century of Public Health—Jubilee Historical Volume of the American Public Health Association, New York*, pp. 412-38.

With W. D. Pierce. The Non-blood-sucking Diptera. In: *The Practice of Medicine in the Tropics*, ed. by W. Byam and R. S. Archibald (London, Henry Frowde and Hodder & Stoughton), vol. 1, sect. 3, chapter 20, pp. 420-48, 19 figs.

1922

The Australian Ladybird in the U. S. Hawaiian Ent. Soc. Proc., 1921:5, 22-28.

Recent Results of Anti-mosquito Work of the Bureau of Entomology. N. J. Mosquito Exter. Assoc., 9th annual meeting, Proc., pp. 68-78, 8 figs., 1 map.

The Use of Poisons As Insecticides in the French Colonies. Jour. Econ. Ent., 15:314-15.

A Braconid Feeding by Indirect Suction. Ent. News, 33:218.

War against Insects. Nature, 109:79-80.

A Side Line in the Importation of Insect Parasites of Injurious Insects from One Country to Another. Natl. Acad. Sci. Proc., 8:133-39.

The War against Insects—The Insecticide Chemist and Biologist in the Mitigation of Plant Pests. Chem. Age, 30:5-6, illus.

1923

International Cooperation in Combating Plant Diseases and Insect Pests. Internatl. Conf. Phytopath. Econ. Ent. Rept., 1923, pp. 36-38.

A Curious Phase of Parasitism among the Parasitic Hymenoptera. Can. Ent., 55:223-24.

Fleas and Lice. Hygeia, 1:238-42, illus.

Concerning Mosquito Control Measures. Hygeia, 1:80-84, illus.

The House Fly—Carrier of Disease. Hygeia, 1:38-48, 8 figs.

An Interesting New Case of Phoresy. Ent. News, 34:90.

Our Fight against Insects. In: *Science Remaking the World*, ed by Otis W. Caldwell and Edwin E. Slosson (New York, Doubleday, Page and Co.). pp. 190-98.

The Yellow-fever Mosquito. U. S. Dept. Agr. Farmers' Bull. 1354. 14 pp., 6 figs.

1924

- Retarded Establishment of Introduced Parasites of Injurious Insects. Natl. Acad. Sci. Proc., 10:16-18.
- Address of the Retiring President: On Entomological Societies—Insect Parasites of Insects. Wash. Ent. Soc. Proc., 26:25-46.
- With F. C. Bishopp. The House Fly and How to Suppress It. U. S. Dept. Agr. Farmers' Bull. 1408. 16 pp., 9 figs.

1925

- An Obvious New Case of Polyembryony. Science, n.s., 62:308.
- The Needs of the World as to Entomology. Ent. Soc. Amer. Ann., 18:1-21.

1926

- Something about the Salt Marsh Mosquito Problem. Wash. Acad. Sci. Jour., 16:100-1.
- A Great Economic Waste. What We Are Doing and What We Must Do if We Would Check the Ravages of Insects. Natural History, 26:124-32.
- Mosquito Work Throughout the World. Amer. Jour. Pub. Health, 16:1210-14.
- The Parasitic Element of Natural Control of Injurious Insects and Its Control by Man. Jour. Econ. Ent., 19:271-82.
- The Work of the Prickly-Pear Board in Australia. Jour. Econ. Ent., 19:872.

1927

- Concerning Phoresy in Insects. Ent. News, 38:145-47.
- The Needs of Medical Entomology. Amer. Nat., 61:173-79.
- A Great Menace—the Rising Tide of Insects. Sci. Amer., 136:114-15.
- The Historical Development and Present Organization of Applied Entomology in the United States. Centbl. f. Bakt., Parasitenk. u. Infektionskrank., Abdruck, 2 abt., 71:105-13.

1928

- Needs in the Study of Beneficial Insects. Ent. Soc. Amer. Ann., 20:445-50.
- An Instance of the Increase of Malaria by Civilization. Science, n.s., 67:136.
- The Use of Arsenicals in French Vineyards. Jour. Econ. Ent., 21:510.
- Entomology. Presidential Address before the 4th International Congress of Entomology, Ithaca, N. Y. Science, n.s., 68:143-45.
- With F. C. Bishopp. Mosquito Remedies and Preventives. U. S. Dept. Agr. Farmers' Bull. 1570, 12 pp.

1929

- Aphelinus mali* and Its Travel. Ent. Soc. Amer. Ann., 22:341-68.

1930

- Entomology. Presidential Address before the 4th International Congress of Entomologists, Ithaca, N. Y. 4th Inter. Cong. Ent. Proc., 1:68-73.
 The Work with Mosquitoes around the World in 1929. N. J. Mosquito Exter. Assoc., Atlantic City, N. J., 17th annual meeting, Proc., pp. 7-30.
 A History of Applied Entomology (Somewhat Anecdotal). Smithsonian Misc. Coll., 84. 564 pp., 51 pls.
 Man and Insects. Md. Acad. Sci. Jour., 1:84-89.
Aphelinus mali in Brazil. Jour. Econ. Ent., 23:286.

1931

- Man and Insects. Smithsonian Institution, Pub. 3092, pp. 395-99.
 The Rise of Applied Entomology in the United States. Smithsonian Institution, Pub. 3091, pp. 387-93.
 The Insect Menace. N. Y. and London, Century Co. 347 pp., illus.
 An Overlooked Suggestion Regarding Practical Use of Parasites. Jour. Econ. Ent., 24:325-26.

1932

- Some Human Eye-spots Classified Zoologically. Science, n.s., 76:409.

1933

- Fighting the Insects. The Story of an Entomologist. New York, The Macmillan Co. 333 pp.

1934

- [Birds and Insects.] Royal Ent. Soc. London Proc., 9, part 2, pp. 24-25.

1936

- The Growth and Importance of Anti-mosquito Work. Eng. News-Rec., 117:118-22.

1937

- Symposium: Insects Affecting Man. Jour. Econ. Ent., 30:9-10.

1939

- Ageing of Insects. In: *Problems of Ageing*, ed. by E. V. Cowdrey (Baltimore, Md., Published for Josiah Macy, Jr. Foundation by Williams and Wilkins), Chapter 3, pp. 53-70.