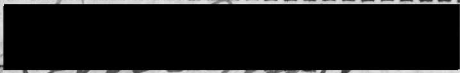


AN ABSTRACT OF THE THESIS OF

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(Name) (Degree) (Major)

Date Thesis presented ~~May 1, 1942~~-----

Title--~~SOME FACTORS IN THE DEVELOPMENT OF NORTHWESTERN ENTOMOLOGY~~-----

Abstract Approved: 
(Major Professor)

The writer, as a graduate student and as an instructor in entomology, has on many occasions been unable to secure certain historical data relevant to the development of entomology in the Northwest.

Validation. Many professional and amateur entomologists have often found themselves at loss to secure the necessary data in connection with certain phases of research or study that were based upon the work of other northwestern entomologists and institutions. Very little has been printed on the subject, and existing manuscript sources are, with the passage of time, becoming fewer.

Purpose. The writer therefore proposed to gather, into a coherent whole, all of the scattered sources of information and by personal interviews, correspondence, travel, and examination of records, present a body of integrated and informative material.

Scope. This study proposes to contain essential information pertaining the developmental factors in northwestern entomology. These are: historical background, institutions, societies, collections, federal state and provincial experiment stations, agricultural and medical economics, and a biographical survey of entomologists.

Results. The basic economy of the northwest is founded upon agriculture and forest industry. The losses in these two categories, due to insect ravages, was realized very early in the settling of the states of Oregon, Washington, Idaho, and the province of British Columbia. Without exception these commonwealths have instituted investigations into possible controls of certain insects and have given instructional work in the colleges and universities. In Chapter II an evaluation of the extent of instruction, its history, content, and the men responsible, has been offered. It is conceded that although the University of Washington inaugurated such studies, in its relation with the Young Naturalist's Society, that Oregon State College is now pre-eminent in the instructional field.

In Chapter III, the writer has traced the growth and function of the entomological societies in the Northwest. The Entomological Society of British Columbia is presumably the most professional with the Oregon Entomological Society filling a larger scope.

In Chapter IV, an account is given of the institutional and private insect collections in the northwest, their contents, origin, location, and present status.

In Chapter V, the federal laboratories and offices, their development, investigations, location, and personnel are mentioned and considerable attention is given to like factors concerning the agricultural experiment stations. In addition a complete listing of all the publications of the above, relating to entomology, is given along with notes concerning medical entomology in the Northwest.

Chapter VI embraces the biographies of many present and past northwestern entomologists, their positions and work, and the institutions with which they are, or were, connected and their contributions.

Conclusion. The writer hopes that the material he has gathered, revised, and annotated, will be of some use to his colleagues and students and will fill the long existing gap concerning the origin and development of certain factors in northwestern entomology.

SOME FACTORS IN THE DEVELOPMENT
OF NORTHWESTERN ENTOMOLOGY

by

DANIEL ERNEST BONNELL

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D. E. B.

Corvallis, Oregon

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SOME FACTORS IN THE DEVELOPMENT OF NORTHWESTERN ENTOMOLOGY

I.

HISTORICAL BACKGROUND

The members of the Lewis and Clark expedition, shivering in their rude shelters at the mouth of the misty Columbia, complained of the unceasing rain and of fleas. In spite of the rugged savagery of the country, in spite of hostile Indians, and the thousands of almost trackless miles from the Atlantic seaboard, the party was nevertheless impressed with the dappled greenness of the Oregon country. A favorable report was made to President Thomas Jefferson.

Years passed, marked only by the slow inexorable growth of the nation westward. The green land of Oregon was inhabited by Indians and leavened only with a sparse sprinkling of trappers, traders, missionaries, and factors.

Malcontents, farmers, doctors, lawyers, gold seekers, merchants, peddlers, fishermen, and soldiers gradually began to pour into the northwest country. Lumbermen sought its rich forests, miners came for gold, farmers sought a livelihood, missionaries sought souls, cattlemen and Basque sheepherders spread over the eastern plains, European immigrants were pulling stumps at Olympia and Astoria. Steel rails were

laid down and locomotives began to replace the covered wagon. Soon the Willamette valley was dotted with church spires and trim white houses were scattered over the rich valleys from the California border to Vancouver, British Columbia and from Astoria to Montana. Large cities sprang into being: Seattle, Portland, Spokane, Vancouver, B. C., Boise, Tacoma, and many others; and, almost before it could be realized, a great section of the world—one in which most of Europe could have been confined—had become civilized, a decent place in which to live and to die. Libraries, museums, educational institutions, great hospitals, were built and sustained. Newspapers and books were published. Men grew tall in the Northwest. Literacy surpassed that of the older sections. Agricultural products were the envy of the world; planks of golden, spicy fir slipped from the saws in an unending stream to the ends of the earth, mighty schools of fish in shining cans spun from the belts, prime beef and mutton, wheat, wool, fruits, seeds, flax, flowers, bulbs, cloth, hops, copper, berries, nuts, and blankets, were shipped by the carload by the shipload to the ends of the earth. The Northwest country, the rich Oregon country had grown up.

Since Ewing Young, who successfully grew crops in the Chehalem Valley in 1834, and Nathan Winship, who planted vegetables along the Columbia as early as 1810, the Northwest

has been known a raiser of crops. By 1850, at least fifty ships had come up the Columbia seeking cargoes of wheat. Many more sought lumber in the Puget Sound and Frazier River area. Idaho was becoming renowned for its vegetables and fruits. Washington became the great apple producing section. The Northwestern country had become one of the world's greatest producers of farm products.

The first steam sawmill was established in Portland in 1850. Since then, lumbering and agriculture have dominated the Northwest. When forests are utilized as crops and when men plant vast areas in fruit and vegetables, many insect problems begin to loom large. Vast stands of timber, whole orchards, and square miles of crops can disappear in a very short time, if insects are allowed to flourish unchecked. It is impossible to calculate the value, in dollars and cents, of the continuous efforts of Northwestern entomologists in attempting to preserve our forests, our crops, our stored materials, our animals, and indeed the health of man himself.

In the older sections of North America and even in California, a great deal has been written about the science of entomology and the men who practice it. Unfortunately, very little has been written about the Northwest in this connection. Sources are few and scattered, and sometimes not altogether reliable. And yet, the science of entomology has progressed

in the Pacific Northwest. Some of the world's finest scientists have, and still are, working here. The area can, with some justice, boast of great institutions of learning, experiment stations, and Federal and Provincial agencies. Too, the shy amateur may be found here in great numbers. Solid professional societies function. A whole indigenous science of entomology may be found here. Thus it might not be considered amiss to attempt to reconstruct the growth of entomology in the Northwest, and of the men, the causes, and the institutions which have made it possible.

II.

ENTOMOLOGY IN NORTHWESTERN INSTITUTIONS

The Northwest, due to the comparative recent settlement of the entire country, lagged considerably in entomological studies. However, once the country began to produce agricultural and other products in sufficient quantities to ship, entomology became increasingly important. Today it has a status on par, or nearly so, with any other part of the civilized world.

The study of this subject has been bound up to a considerable degree with state and provincial institutions of learning which have employed skilled entomologists to offer service courses and to work upon insect problems.

The Northwest has no large private institutions of learning. There are a considerable number of small colleges and universities of high caliber, but these, for obvious reasons, have been unable to concentrate upon the rather specialized subject of entomology. With one or two exceptions, in this case individual instructors, the teaching of entomology and its application to research and field projects

has been largely concentrated in the large universities and colleges. As previously mentioned, this paper is arbitrarily confined in geographic scope.

The institutions receiving major consideration in this section are: The University of Idaho at Moscow; The University of British Columbia at Vancouver, B. C.; The University of Washington at Seattle; The Washington State College at Pullman; and Oregon State College at Corvallis. The works in smaller institutions can be found under the names of instructors covered in the section on biography.

A.

HISTORY OF ENTOMOLOGY AT THE UNIVERSITY OF BRITISH COLUMBIA

Although the University of British Columbia was founded in 1915, there were no courses given in Entomology until 1919. From 1919 to the present time they have given some very comprehensive studies in this field. Entomology, when first given, was under the department of Botany and Zoology.

A formal undergraduate course in Entomology appears to have been offered first in Canada at the Ontario Agricultural College in 1877. Courses appeared in the curricula of the following institutions in the years indicated.

Nova Scotia College of Agriculture	1905
Manitoba Agricultural College	1906
Macdonald College	1907
University of Toronto	1908

Agric. College of Ste. Anne-de-la-Pocatiere	1915
Oka Agricultural Institute	1917
Queens University	1918
University of British Columbia	1919
University of Saskatchewan	1919
Laval University	1919
University of Western Ontario	1924
University of Manitoba	1929

As would be expected, the great growth of entomology in Canada has been recent. With the exception of the course offered at the Ontario Agricultural College in 1877, all undergraduate courses in entomology have appeared on the curricula of the respective institutions with the past forty years.

The general history of entomology at the University of British Columbia is as follows:

The first course in entomology was given in 1919 by C. Fraser, professor of Zoology. In 1921 and 1922, instruction was given by R. C. Treherne; in 1922-1924, by Mr. Leckie. In 1924, Kenneth Anden delivered a course in Forest Entomology and in the same year, G. J. Spencer joined the department of zoology as entomologist.

Instruction in entomology has always been in the department of zoology, in the Faculty of Arts, although most of the

students have been in Agriculture. The first course was a beginners' course in Morphology and Taxonomy. This was followed by courses in Economic Entomology. When Professor Spencer joined the department the courses were remodeled and enlarged to provide an undergraduate major in the subject.

Undergraduate courses in entomology now offered at the University of British Columbia are listed and described as follows:

Zoology 4 - General Entomology. Elements of Morphology, anatomy, physiology of insects, identification of specimens of all orders represented in the province down to families and some common species. Key work to families and the elements of wing venation.

Collection - 100 specimens

Two lectures and four laboratory hours for one term.

Required for agricultural students majoring in Agronomy and Horticulture.

Zoology 7 - Economic Entomology. Life histories of economic insects of the province, special attention being paid to those likely to be introduced, the rearing during the term of one insect through at least one life cycle, seminar work on literature and writing and presenting of summaries of reports and bulletins.

Six Hours for one term - two units

Required for agricultural students majoring in Agronomy and

Horticulture.

Zoology 7A - The Principles of Forest Entomology, with special studies of the life histories and work of the chief destructive bark beetle of the province.

One lecture and two laboratory hours for half a term.

Required of fifth year in Forest Engineering.

Major Courses: (a) External morphology and wing venation.
(b) Internal anatomy and Histology
(c) Taxonomy

Students majoring in Entomology receive individual instruction in these courses in key work to species, a full course in wing venation, further work in comparative morphology and practice in dissection and sectioning of insects. Practice is given in Photomicrography where time permits. A thesis is required for specialists. Time and units for these courses are arranged separately with each student.

Honours Arts students majoring in Entomology are required to take comparative anatomy of invertebrates and vertebrates, normal vertebrate histology and vertebrate embryology. These subjects are not required of students in Agriculture who major in Entomology.

A description of courses, together with the year in which they were added to the curriculum, is contained on the following page.¹

¹ Descriptions are verbatim from the Catalogs of the University of British Columbia.

1919-1920 - 20 Economic Zoology

20 a. Economic Entomology - A study of the insect of animals and plants; means of combating them.

21 Morphology

21 b. Morphology of Insects - General Entomology: a collection is required.

1921-1922 - Zool. 4 Morphology of Insects - (course material the same as listed under 21 b.

Zool. 7 Economic Entomology - (listed formerly as 20 a.

1923-1924 - Zool. 4 Morphology of Insects and Forest Entomology - (No description of Forest Ent. given. It was listed only for 1923-24.)1930-1931 - Zool. 9 Advanced Entomology - A course in
(a) Insect Morphology and wing venation,
or (b) Internal Anatomy and Histology,
or (c) Taxonomy.General Notes

1915-1916 - First session of the University of British Columbia

1917-1918 - Department of Biology organized. Included Zoology

1918-1919 - Reorganization into Department of Biology and Zoology

1919-1920 - Further reorganization into Department of Botany
and Zoology

1920-1921 - Return to Department of Biology

1921-1922 - Permanent reorganization into Department of Zoology

B.

THE DEVELOPMENT OF ENTOMOLOGY AT THE UNIVERSITY OF WASHINGTON

Entomology, at the University of Washington, has remained in the past and still does at the present time remain an integral function of the Department of Zoology, and must be included in any definitive account of the same.¹

¹ The University of Washington Catalogue for 1875 lists "Miss May W. Thayer, German, Botany, Physiology." That for 1878-79 lists "Mrs. L. P. Anderson, Preceptress, Botany and French" and "J. T. Martin, B.S., Physiology and Common English" and notes on p. 10 that "the work of collecting a cabinet of specimens in Natural History is progressing, in the hands of the instructors in Botany, Physiology and Elocution."

From 1880 to 1882 Frank P. Gilman (1853-1918), B. A., Princeton 1879, was professor of Natural History, Physics, and Astronomy with Mrs. Louisa P. Anderson in Botany and Zoology, at least in 1880 (see catalogue for 1879-80). From 1886 on Gilman was a Presbyterian missionary in Hainan, China, where he died. See H. M. McCandliss, pp. 108-110 in The Isle of Palms - Sketches of Hainan, the American Presbyterian Mission, Island of Hainan, South China (printed at the Commercial Press, Ltd., Shanghai, 1919, 153 pp.); Meany, Wash. Hist. Quart. XXII, 1931, pp. 210-12.

The registration at the University from 1879 to 1885 fluctuated between 34 and 78; it did not attain the 500 level until 1899. The thousand level was attained in 1905, the two thousand level in 1909, the five thousand level in 1917, the ten thousand level in 1926.

Entomology probably had its inception at the University with the formation of The Young Naturalists' Society.¹ Thus the beginnings of this group in 1879 represented the first entomological step in the area. For the next two decades this group dominated entomology at the University.

This society was organized by a half dozen students, including Brooks P. Randolph, Charles A. Denny, and Edmond S. Meany, and met during the first six years of its existence in a small brick building back of the residence of Mr. A. A. Denny. The rolls boasted of some twenty-five names, but a nucleus of eight or nine young men managed the proceedings.

The society received a real impetus when Orson Bennett Johnson (1848-1917) was appointed as professor of natural science at the University. Johnson brought an extensive cabinet of natural history specimens with him from Oregon, and at once began to collect and add to it with material from the new region. He sent specimens to specialists in the East, and a spider, Attus johnsonii, was described by Peckham in 1883 on the basis of Johnson's Washington material. Johnson was

¹ See the Section on Entomological Societies. Tarrar, (Wash. Alumnus XIII, Jan. 1922, p. 12) attributes the formation of this organization to the general interest aroused by President Whitworth offering the student a "scientific" course in 1875.

particularly interested in the Lepidoptera and made extensive collecting and camping trips with his students. Favorite spots were Rocky Point (Orchard Point) near Bremerton, and Eagle Creek near Lilllewaup Falls on Hood Canal.

In 1885, at the instigation of Professor Johnson, the Young Naturalists secured a twenty-five year lease from the Regents of the University of Washington to a plot of ground which is the present site of the Cobb Building in the heart of downtown Seattle. They raised \$1965 among themselves and constructed a two-story building. The Regents turned over to the Society all natural history specimens in their possession, and Professor Johnson contributed extensive series of specimens.

Just previous to 1892, Professor Johnson developed crippling arthritis which steadily progressed. Johnson determined to seek more adequate medical aid. He hired Charles Hill, from his own funds, to take over his work. Johnson returned from the East in the spring of 1893, unrelieved but determined to carry on his work. Consequently he was retained by the University as Professor of Entomology and Curator of the Museum until 1896, when the incurable nature of his disease became apparent and his connection with the University was severed. Hill meanwhile continued as a staff member until 1898, when

he went to Northwestern University as assistant professor of embryology and histology.

Meanwhile, the Young Naturalists declined. The group occupied the new clubhouse in 1886. However attendance began to fall and the years of 1891, 1892, and 1893 showed only seven meetings. However in May, 1894, brisk activity was again the keynote. Correspondence and exchange of materials was so heavy that the organization achieved fame in national scientific circles. Membership remained at about forty, with a small group acting as an efficient nucleus. The Library was increased to several hundred volumes, subscriptions were entered with a number of journals, and the group sponsored several series of lectures by nationally important naturalists.

The chief factor in the renaissance of the Society was the advent upon the campus of a new student—Trevor Kincaid. Born in Ontario in 1872, Kincaid at the age of 16 came west with his physician father and settled in Olympia. The boy was very interested in natural history and before coming to the University in 1894 had assembled an insect collection of 40,000 specimens. This was in addition to 100,000 specimens sent away to eastern specialists! Shortly after registering as a student at the University, Kincaid was recognized as the Northwest's outstanding Naturalist.

In 1895, the University moved from its original site in downtown Seattle to the area it occupies at present on the shores of Lake Washington. The Department of Biology was assigned quarters in the north wing of the main floor and basement of Denny Hall. Kincaid was offered a position by David Starr Jordan of Stanford, but Meany and John Wiley met the offer and Kincaid was appointed as a laboratory assistant in his Sophomore year. In 1898, Hill was supplanted by the botanist Homer Redfield Foster. Kincaid, upon his graduation in 1899, was made assistant professor of biology and in 1901, upon the formation of separate departments of zoology and botany, was made professor of zoology, a position that he has held since.

In 1902, the Department of Zoology transferred its quarters from Denny Hall to the second floor of the new Science Building¹ where it remained until the summer of 1930.

The end of the Young Naturalists' Society was near. As Kincaid has styled it "the young naturalists had become old naturalists." 1898 listed thirteen meetings; 1899, only three meetings; and the year 1900, only one. Later one meeting was held in 1904 and one in 1905. The moving of the campus was a decisive factor. The Regents wished to lease

¹ Remodelled and rechristened Vernon Lewis Carrington Hall in 1931.

the downtown campus for business purposes. The Society dissolved, with the library and collections being turned over to the University.

Professor Johnson, though confined to a wheel-chair, continued to collect publications and was building up an extensive cabinet of Coleoptera and Lepidoptera. He continued this work nearly to the time of his death on March 9, 1917.

From 1901 on, Trevor Kincaid continued his interest in entomology. A number of classes were taught in this connection by Kincaid until the advent of M. H. Hatch in 1927. In 1928, physiology was removed to Denny Hall. In 1930, the Orson Bennett Johnson Biological Laboratory was established and the Zoology Department, exclusive of physiology, occupied the west half of the first floor and the entire second floor of the new building.

Kincaid served with such distinction as Entomologist on the Harriman Alaska Expedition in 1899 that L. O. Howard, Chief of the Bureau of Entomology, selected him to collect parasites of the gypsy-moth in Japan and southwestern Russia.

Entomology, at the University of Washington has thus been based primarily upon the endeavors of three men:

O. B. Johnson from 1882-1899; Trevor Kincaid from 1899-1927; and M. H. Hatch from 1927 to date.

In addition to those named on the preceding page, the University has influenced a number of other persons. Some of them remained as amateur entomologists, others took masters' degrees and are engaged in various grades of teaching and research, for institutions, states, and the federal government. One Doctor of Philosophy degree, with a major in entomology, has been granted to B. G. Thompson of Corvallis.

Only one course in general entomology is offered at present. However, generous facilities are available for both graduate and undergraduate research students under the direction of M. H. Hatch.

A description of courses and the years in which they were added to the curriculum follows. Descriptions are taken verbatim from catalogues.

1875-1902 - Entomology taught only incidentally or as part content of other zoology courses.

1902-1903 - 10, 11, 12 - Entomology - The structure, classification, and natural history of insects; the preservation and identification of the various orders of insects in the vicinity. (3 quarters)

1903-1904 - 10, 11, 12 relisted as 7 and 8. (2 semesters)

1905-1906 - 11 - Entomology - same description as above.

1906-1907 - 10 - Entomology - The structure, classification, and natural history of insects. This course involves the collection, preservation, and identification of the insects found in the local fauna.

- 1907-1908 - 11 - Forest Entomology - A course dealing with the relation of insects to the forest, including the classification and habits of forest insects, and the practical handling of insects injurious to forest welfare.
- 1910-1911 - 14, 15 - General Entomology - An introduction to the study of insects, including their structure, classification, ecology, and economic relations. Lectures, laboratory, and field work.
- 1917-1918 - 13 - Elementary Entomology - The structure, classification, and economic relations of insects.
- 103 - Forest Entomology - The classification and economic relations of insects injurious to the forests.
- 104 - Advanced Entomology - Studies in the morphology and ecology of insects, with emphasis on forms of economic importance.
- 1921-1922 - 56 - Entomology - Same description as Elementary Entomology.
- 1922-1923 - 111 - Entomology - Same description as Elementary Entomology.
- 1928-1929 - 112 - Insect Morphology - The structure and taxonomy of insects.
- 1929- - 111 - Entomology - Same description as Elementary Entomology.

Under the direction of Dr. M. H. Hatch, a number of excellent Master's, and one Doctor's, theses have been written by graduate students. These include, of course, only those dealing with entomology. Some, indeed, would be considered of sufficient scope and originality to qualify as Doctor's theses

in other institutions. A list of these would include:¹

Master's Theses

Gray, Barbara. The Coleoptera of Washington: Carabidae: Agonini. 1936.

Lanphere, Hortense Griffin. The Aquatic and Semi-Aquatic Heteroptera of Western Washington. 1936.

McGrath, Rita Margaret. The Coleoptera of Washington: Sphaeritidae and Histeridae. 1936.

Beer, Frank. The Coleoptera of Washington: Euprestidae. 1938.

Doctor's Thesis

Thompson, B. G. The Aegeridae of the Pacific Northwest. 1938.

¹ Publ. Univ. Wash. Theses Ser.

² It is the writer's impression that Miss Gertrude Minsk has completed a thesis on a group of Washington Carabidae; that Mr. Patterson has or is working on the Scolytidae and that Mr. Ben Leighton is working on the Lepidoptera. These theses are largely taxonomic theses.

C.

THE DEVELOPMENT OF ENTOMOLOGY AT THE UNIVERSITY OF IDAHO

On October 3, 1892, the University of Idaho opened its doors to students. It was four years later that the first work in Entomology was offered. Elementary and Economic Entomology was a course required of all agriculture students. This course was taught by Professor John M. Aldrich, M. S., of the Zoology department. Since this time, numerous courses have been added and numerous men have contributed to the entomological work at the University of Idaho.

The following material illustrates the story of this development:

1896-97 - Professor John M. Aldrich, professor of Zoology, offered two courses in Entomology. Elementary and Economic Entomology and Advanced Entomology were those offered.

1898-1902 - Same as above.

1903-04 - No Entomology courses listed.

1906-07 - Five courses offered. Two in Entomology, one in Economic Entomology, and two in Advanced Entomology.

1907-08 - J. M. Aldrich made professor of Biology. Three courses given. One in Elementary Entomology and two courses of Advanced Entomology, which included Economic Histology and Systematic Entomology. Zoology was listed in the department

of Biology, under the School of Letters and Science.

1908-09 - Same as above.

1910 - Four courses were offered - General Entomology, Forest Entomology, and two courses in Advanced Entomology.

1911-12 - Same as above.

1913 - The department of Zoology and Entomology was in the College of Letters and Science. Professor Wodsedalek became the Head of the Department, assisted by Mr. Griffith. The courses were the same as those offered in 1910.

1914-15 - Same as above.

1916 - The following courses were given in Entomology. Elements of Entomology, Forest Entomology, Horticultural Entomology, Farm Crop and Garden Entomology, Household and Mill Pests, Beekeeping, and two courses in Advanced Entomology.

1917-18-19-20-21-22-23 - Same as above.

1924 - Associate Whitehead was appointed to the department to teach Entomology. Following courses were given: General Entomology, Forest Entomology, Economic Entomology, Insect Anatomy, Special Problems, Household and Mill Pests, Beekeeping, two courses in Research, and two courses in Advanced Entomology.

1925-26-27 - Same as above.

1929- The following courses were given: General Entomology, Forest Entomology, General Economic Entomology,

External Insect Anatomy, Systematic Entomology, two courses in Special Problems, two courses in Research, and two courses in Seminar.

1930 - There was a course added called Entomological Technique.

1931 - Same as above.

1932 - Wakeland was on leave of absence. Associate Professor Shull acted as Head and taught all of the following courses: General Entomology, External Insect Anatomy, Economic Entomology, two courses in Systematic Entomology, two courses in Special Problems, Entomological Technique, Pro-Seminar, Research, and Seminar.

1934-35 - Wakeland and Shull in the department. Courses were the same as previously mentioned, with a course offered in the Horticulture department for Entomology students called Insecticides and Fungicides.

1935 - Same as above.

1936 - Forest Entomology was added to those already given.

1937 - Same as above.

1938 - Shull became the Professor, assisted by Assistant Professor Fisher. No change in courses.

1939 - A new course in Advanced Entomology which dealt with the structure, development, classification, life-history,

control, ecology, review of literature, and history of Entomology, A course in Insect Physiology and Toxicology was also given.

The economic work at the University of Idaho may be found in the section on Economic Entomology.

A description of courses and the year in which they were added to the curriculum follows.¹

1898-1899 - Zool. 2 - Economic Entomology - External and internal structure of insects, their habits and transformations; outlines of classification; injurious insects of the state and locality with practical work in spraying to destroy them. A collection of a specified number of insects is required of each student.

Zool. 3 - Advanced Entomology - Internal anatomy continued; classification of the material already collected by the student, and of additional species, representing in all the principal families, genera, and a few species.

1906-1907 - Biol. 7 - Entomology - External and internal anatomy of insects, their physiology and development; some histological work.

Biol. 8 - Entomology - Habits and larval forms of insects; classification and economic relations. A classified collection of insects is required.

Biol. 10 - Economic Entomology - An abridgment of 7 and 8, with more attention to economic work, to meet the requirements of students

¹ Descriptions are taken verbatim from the catalogues of the University of Idaho.

in the agricultural course. A collection is required. Practical work in spraying will be provided.

Biol. 11 - Advanced Entomology - A second year's work in entomology for students who have completed courses 7 and 8. The student may arrange for economic, histological, or systematic work.

Biol. 12 - Advanced Entomology - A continuation of 11.

1907-1908 - Biol. 10 - Elementary Entomology - An introductory study of insects, treating especially of their external and internal physiology, transformation, and habits. Species injurious to farms and orchards receive especial attention. A classified collection is required.

Biol. 11 and 12 - Advanced Entomology - A continuation of entomology for students who have completed course 10. The student may arrange for economic, histological, or systematic work.

1910-1911 - Biol. 10 - Elementary Entomology relisted as General Entomology.

Biol. 10a - Forest Entomology - In the first half of the semester this course is identical with 10, but the remainder is given to the study of insects in the forest, the various bark beetles, borers, leaf devourers, etc. Students are required to collect with reference to this branch of the subject, or may be allowed to undertake some investigation in lieu of making a collection.

1913-1914 - Zool. 10 - General Entomology - Morphology, anatomy, physiology, embryology, classification, and life-histories of insects and the more general problems of insect life. Special attention is devoted to the life-histories of the most economic species, and the relation of insects to agriculture, horticulture, and public health.

Zool. 10a - Forest Entomology - In the first part of the semester this is the same as the preceding, but the latter part is devoted to the study of the principal insects injurious to forest and shade trees. Students are required to collect with special reference to this branch of the subject.

Zool. 11 - 12 - Advanced Entomology - Same material as Biol. 11, 12.

1916-1917 - Zool. 101 - Elementary Entomology - Relisting of General Entomology.

Zool. 104 - Forest Entomology - A collection will be made of forest and shade tree insects and forms of injury produced. Methods of forest insect control in both Europe and America will focus on parasitic and other enemies in order to develop a rational policy for the control of these natural enemies.

Zool. 105 - Horticultural Entomology - A course preparing for commercial fruit-growing. It treats of insecticides and the machinery needed to destroy fruit pests; insects of tree and bush fruits in the northern states (strawberry, cranberry, citrus, and nut pests included if requested); outlining spray cauldrons to adopt the practice of spraying to the life histories of insects; collecting fruit pests and samples of their damage.

Zool. 106 - Farm Crop and Garden Entomology - One-half the time is devoted to insects of field crops, the other half to insects of the home garden. Laboratory work may be taken wholly in one or the other phase of the subject, forming a collection of pests for the crops studied, pressing samples of leaf injury, etc. for exhibits for school-rooms, fairs, and museums.

Zool. 107 - Household and Mill Pests - Intended for housekeepers, grocers, warehousemen, and millmen, and students in domestic science, and agronomy. The importance of several household pests in the spread of various diseases is included. A collection of grain, dry groceries, fabric-eating, and household pests will be formed.

Zool. 108 - Beekeeping - Bee cultures and honey production with Italian strain of bees. Use of bees in fruit and clover seed production, methods of the modern apiary, and field study of some types of bee yards. Cooperative work with local beekeepers is recommended.

Zool. 109-110 - Advanced Entomology - Advanced work in special lines, economic, histological, or taxonomic.

1923-1924 - Zool. 201, 212 - Research - Problems will be assigned and students prepared for independent investigation in any phase of Zoology or Entomology will be given all the opportunities for carrying on their work.

Zool. 203, 204 - Seminar - Reports on advanced literature in the various phases of Zoology.

Zool. 62 (102) - Elementary Entomology.

Zool. 64 (104) - Forest Entomology.

Zool. 67 (107) - Household and Mill Pests.

Zool. 68 (108) - Beekeeping.

Zool. 165 (105) - Horticultural Entomology.

Zool. 166 (106) - Farm Crop and Garden Entomology.

1924-1925

Ent. 1 - General Entomology - Anatomy, physiology, classification, and life history studies of insects in general. Detailed studies of the life histories of the most important insects, with a view to thorough understanding of the principles underlying control measures for these insects. The more important general facts about insects as a class, the main characters of the different groups, and how the structure and habits of the group render it susceptible to certain control measures, while in other groups entirely different measures are necessary.

Ent. 6 - Forest Entomology - Study of insects in general and the principles of insect control, followed by special consideration of the insects of greatest economic importance in

in the forests. The importance of insects in forests will be stressed and detailed studies of the life histories and control of the various groups will be discussed. Each student will be expected to make thorough study of some particular insect and submit a report on it in the form of a term paper.

Ent. 101 - Economic Entomology - Detailed studies of the principles of insect control followed by specific attention to individual insects of greater importance, to show how principles of control may be applied under varied conditions. The insects studied will be selected with intent to illustrate as nearly as possible all the conditions that may arise in insect control.

Ent. 105 - Insect Anatomy - External structures of various orders of insects. The types studied are selected to present the essentials of the structure of the exoskeleton, thus affording a basis for studies in taxonomy.

Ent. 111-112 - Special Problems - This course is open to the more advanced students. Assignments will be made to special problems to be worked out at any time agreed upon between the student and the instructor. Problems of economic importance will be stressed.

1925-1926

Ent. 21 - Bee Culture - Formerly Zool. 68, Beekeeping. A practical course in apiary management. The more important phases of beekeeping, such as swarm control, increase, queen rearing, disease control, honey grading, and marketing, etc., are taken up. The work is designed to give a general knowledge of beekeeping for the beginner.

Ent. 31 - Household Entomology - Formerly Zool. 67. A study of the importance, life histories, and control of insect pests of homes, including those directly injurious to human beings, those acting as carriers of diseases and those injurious to clothing, food, carpets, furs, etc.

1929-1930

Ent. 101 (17) - General Entomology - Study of structure, development classification, life history, and exology of insects.

Ent. 102 (6) - Forest Entomology - Study of life-history and habits of important insects affecting forests, forest products and ornamentals.

Ent. 103 (105) - External Insect Anatomy - Study of insect characteristics used in classification.

Ent. 104 (102) - Economic Entomology. - Study of the habits and effects of insects and of the principles of insect control.

Ent. 105, 106 - Systematic Entomology - Study of the classification of insects.

Ent. 107, 108 - Special Problems.

Ent. 110 - Entomological Technique - Museum methods of insect preservation, preparation of demonstration materials, life-history study technique.

Ent. 111, 112 - Pro-Seminar.

Ent. 209, 210 - Research.

Ent. 211, 212 - Seminar.

1932-1933

Ent. 51 (101) - General Entomology.

1933-1934

Animal Husbandry 175 - Parasites and Parasitosis of Domestic Animals - A study of the life cycle, distribution, economic importance and control of insects, ticks, mites, roundworms, flat worms, protozoa, and other parasites of domestic animals. The pathology of the host and the importance of parasites as vectors of disease will be considered. (This course open to entomology students and cooperatively taught by an entomology instructor.)

1934-1935

Horticulture 180 - Insecticides and Fungicides - Application, effects, and chemistry of insecticides and fungicides. Given cooperatively by the departments of Horticulture,

Agriculture, Chemistry, Agricultural Engineering, Entomology,
and Plant Pathology.

1936-1937

Ent. 109 - Forest Entomology - Formerly Ent. 102.

1939-1940

Ent. 213 - Advanced Entomology - Advanced study of
structure, development, classification, life history, ecology,
control of insects; review of important literature and history
of entomology.

Ent. 214 - Insect Physiology and Toxicology - Study
of life processes of insects; history of preparation and
application of insecticides and methods for study of insect
physiology and toxicology.

D.

THE DEVELOPMENT OF ENTOMOLOGY AT WASHINGTON STATE COLLEGE¹First and Second Annual Catalog²

In 1889 a special commission was appointed by the Legislature to establish a state college. This commission did not succeed in locating and establishing a college. In the legislation passed by the state in 1889, it was stated that Morphology and Physiology of the lower forms of animal life, with special reference to insect pests, was to be offered to the students. This instruction was to be under the jurisdiction of the department of agriculture, which was ordered to offer instruction in six other fields in addition to the field having reference to study of insect pests. The institution was eventually located at Pullman, Washington.

Under the heading, "Course in Agriculture," a course called Entomology was listed for agricultural students in the spring term of the junior year in place of general zoology. It was primarily an economic entomology course, in which the aim was to familiarize the student with important insect pests, and it

¹ Generous acknowledgement is made to Frederick A. Kirsch, assistant in Zoology at Washington State College, for his painstaking work in assembling the bulk of the material in this section. The material is, at present, in an unpublished manuscript at Washington State College.

² Consult section on Biography for further information regarding the staff.

was planned that field demonstrations on the control of these insect pests would be given whenever possible in the field.

This course which carried three hours of class work a week was offered for the first time during the third quarter, or Spring Session as it was called, of the year 1894. The title of the course was Entomology and required three hours of class exercise a week.

In January, 1892, there were 16 freshmen entered.

John O. B. Scobey, A.M., was professor of Agriculture and no Entomology courses were offered. Charles V. Piper was not listed as an instructor in this year,¹ but the original catalog has his name on the fly leaf, indicating that the book belonged to him. It does not appear from the catalog that a

¹ A. L. Melander, in a letter received by the writer in March, 1941, says, "Entomological work began about 1893 when C. V. Piper came as Entomologist to head the Department of Botany and Entomology."

R. W. Doane came shortly after to assist Professor Piper, but left about 1898 to take charge of oyster culture work near Keyport for the State.

R. E. Snodgrass then was appointed as Assistant Entomologist to replace Prof. Doane, but left at the same time as Prof. Piper, the summer of 1903, to go to Stanford University, Prof. Piper entering the U.S.D.A. as Agronomist.

In the interim of the Fall Term, Prof. R. K. Beattie acted as Entomologist in addition to his duties as Prof. of Botany. Upon the departure of Prof. Piper, Mr. Beattie was made Head of

course in Entomology actually was taught at this time.

S. B. Conover evidently was president of the institution at the time. Zoology courses were offered to students in their junior year, if enrolled in any department of the college.

This carries the history up to June 21, 1894.

Third Annual Catalog (September 26, 1894 to June 27, 1895).

Courses in Entomology - Zoology

No. 1. General Entomology - Beginning general course.

No. 3. Special Entomology - Systematic Entomology.

Evidently the first course to be offered was abandoned and course 1 and 3 substituted. Charles V. Piper, M.S. degree, Botanist and Entomologist, Professor of Zoology and Botany.

the combined Department of Botany and Zoology. Zoology instruction was given by H. S. Davis, and William Lawrence did some entomological investigation at the branch Experiment Station at Puyallup.

I arrived in January, 1904, as Assistant Entomologist and Instructor in Entomology; was promoted in 1906 to Professor of Entomology and Entomologist of the Experiment Station. In 1907 the Department of Zoology and Entomology was separated from the old combined Department and I was assigned its Head, holding that position until my resignation in 1926.

In 1926 Dr. R. L. Webster arrived to continue the position of Entomologist and Head of the Dept. of Zoology and Entomology.

Merrill A. Yothers, now at Yakima in the Federal Bureau of Entomology, came about 1910 as Assistant Entomologist, remaining until about 1915.

Professor Piper taught all botany, zoology and entomology that was offered.

Botany and entomology were put into a separate department from agriculture during this year; it was called Department of Botany and Zoology, including Entomology. The Department received as donations during 1894-95 seven spraying pumps and nozzels to go with them. Also the school changed from the quarter system to the semester system at this time. Entomology was not taught until the junior year.

Fourth Annual Catalog (September 25, 1895 to June 25, 1896)

Excerpt taken from catalog:

Zoology.

The full course in zoology requires one year's work in Botany and three in Zoology, two of which may be in Entomology.

Zoology 5 - General Entomology - had been numbered Zoology 3 the previous year.

Zoology 6 - Special Entomology - Systematic Entomology.

(cont.)

Anthony Spuler replaced Mr. Yothers as Assistant Entomologist, was promoted to Associate Entomologist in 1925. He was accidentally drowned about 1930.

At the Puyallup Experiment Station Mr. Benton Stookey did entomological work about 1915-1925, maybe longer."..A. L. Melander

Zoology 7 - Special work - "Competent students will be guided in special work in advanced zoology or entomology."

Insect collection quite large now. First mentioned in 1893-94.

Agriculture 7 - Six weeks' course in Entomology offered by department of Agriculture, "was a study of anatomy, nomenclature, control, insecticides, life histories of principal pests."

Charles V. Piper in charge and only professor in the department.

Fifth Annual Catalog (1895-96)

Zoology 9 - General Entomology - anatomy, economic, some systematic entomology included in this course. Formerly called Zoology 5.

Zoology 10 - Special Entomology - "Systematic entomology and all its phases."

Zoology 12 - Biological Seminary - advanced students in which special study in systematic entomology was offered.

Botany and Zoology laboratories in same room and using same equipment.

Charles V. Piper head of department. Adolph Schoenmann, Assistant Professor, served as instructor in Dairying in addition to teaching courses in Botany and Entomology.

Sixth Annual Catalog (1896-97)

Head of Department - Charles V. Piper

Assistant - R. W. Doane

Zoology 4 - General Entomology - No prerequisites. A systematic study of insects in general (Formerly Zool. 9).

Zoology 8 - Economic Entomology. Anatomy, pest control, insecticides, rearing methods. No prerequisites.

Zoology 9 - Zoological Seminary - Systematic Entomology. Thesis required at end of course. (Formerly Zoology 12).

Seventh Annual Catalog (1897-98)

Head of Department - Charles V. Piper

Assistant - R. W. Doane

Zoology 4 - General Entomology - Same as previous year.

Zoology 8 - Economic Entomology - Same as previous year.

Zoology 9 - Zoological Seminary - Systematic Entomology offered.

Entomology was taught in the winter school for farmers.

Eighth Annual Catalog (1898-99)

Head of Department - Charles V. Piper, Professor

Assistant - R. W. Doane

Zoology 4 - General Entomology - Same as previous year.

Zoology 8 - Economic Entomology - Same as previous year.

Zoology 9 - Zoological Seminary - Same as previous year.

A separate laboratory was provided for Entomology, an

insectary, and spraying apparatus.

Ninth Annual Catalog (1899-1900)

Head of Department - Charles V. Piper, Professor

Assistant - R. W. Doane

Instructor in Botany - R. Kent Beattie

Zoology 4 - General Entomology - Same as previous year.

Zoology 8 - Economic Entomology - Same as previous year.

Zoology 9 - Zoological Seminary - Same as previous year.

An instructor in Botany was added to the staff. Other than that no changes were made.

Tenth Annual Catalog (1900-01)

Head of Department - Charles V. Piper, Professor

Assistant Professor of Entomology - Robert E. Snodgrass

Zoology 4 - General Entomology - Same as previous year.

Zoology 8 - Economic Entomology - Same as previous year.

Zoology 9 - Zoological Seminary - Same as previous year.

Eleventh Annual Catalog (1902)

Head of Department - Charles V. Piper

Assistant Professor in Entomology - Robert E. Snodgrass

Zoology 4 - General Entomology - Same as previous year.

Zoology 8 - Economic Entomology - Same as previous year.

Zoology 9 - Advanced Entomology - prerequisite, Zool. 4.

No description of course. Took place of Zoological Seminary.

Twelfth Annual Catalog (1903)

Head of Department - Charles V. Piper

Assistant Professor in Entomology - R. E. Snodgrass

Zoology 4 - General Entomology - Same as previous year.

Zoology 8 - Economic Entomology - Same as previous year.

Zoology 9 - Advanced Entomology - Same as previous year.

Thirteenth Annual Catalog (1904)

Head of Department of Botany and Zoology - R. Kent Beattie,
acting Professor of Botany

Instructor in Vertebrate Zoology - Herbert S. Davis

Instructor in Botany - W. H. Lawrence

Instructor in Entomology - A. L. Melander

Zoology 4 - General Entomology - Mr. Melander. No pre-
requisites.

Zoology 8 - Economic Entomology - Mr. Melander. No
prerequisites.

Zoology 9 - Advanced Entomology - Mr. Melander. Zool. 4
prerequisite.

Fourteenth Annual Catalog (1905)

Head of Department - R. Kent Beattie, Acting Professor
of Botany

Herbert S. Davis, Assistant Professor of Zoology

W. H. Lawrence, Instructor in Botany

A. L. Melander, Instructor in Entomology

Zoology 4 - Systematic Entomology. Mr. Melander. No prerequisites. Text: Comstock's Manual for Study of Insects.

Zoology 4a - General Entomology. Text: Packard's Text Book of Entomology - Mr. Melander.

Zoology 8 - Economic Entomology. Text: Smith's Economic Entomology. Mr. Melander.

Zoology 9 - Advanced Entomology - Histology, Ethology, Physiology. Prerequisites Zool. 4 and Zool. 4a. Mr. Melander.

Zoology 12 - Photography. As applied to students in Biology. Mr. Melander. Course not directly related to Entomology.

Fifteenth Annual Catalog (1906)

Head of Department - R. Kent Beattie, Professor of Botany.

Herbert S. Davis, Ass't. Professor of Zoology

W. H. Lawrence, Instructor in Botany.

A. L. Melander, Instructor in Entomology.

Zoology 4 - Systematic Entomology (Same as in 1905)

Zoology 4a - General Entomology " " " "

Zoology 8 - Economic Entomology " " " "

Zoology 9 - Advanced Entomology " " " "

Zoology 12 - Photography " " " "

Zoology 13 - Biological Illustration - "preparation of

drawings for reproduction in ink, color, etc." Mr. Melander.
4 hours.

Sixteenth Annual Catalog (1907)

A new building, called Science Hall, was constructed and housed the Botany, Zoology and Entomology laboratories. The Entomology laboratory contained a collection of insects, Entomological library and Insectary was connected to it. Mention of a gasoline power sprayer is made. Department of Zoology was created in this year and Entomology is still included under Zoology. To obtain a B. S. degree in Entomology one had to take the last three years of college work in Entomology.

Head of Department - A. L. Melander, Professor

Walter T. Shaw - Assistant Professor

Courses intended primarily for students in Entomology:

Zoology 1 - General Zoology - W. T. Shaw

Zoology 4 - Systematic Entomology - Melander (Same as '05)

Zoology 4a - General Entomology - Melander, Text:

Folsom's Entomology.

Zoology 9 - Economic Entomology - Same as in 1905.

Zoology 12 - Photography - Scientific yet practical
photography - Melander

Zoology 13 - Biological Illustration - Same as before

Zoology 9 - Advanced Entomology - Same as in 1905.

Zoology 16 - Zoological Research - "Original investigation of problems in zoology." Melander or Shaw.

Seventeenth Annual Catalog (1908)

Head of Department, including Entomology, A. L. Melander

William T. Shaw, Assistant Professor

During this year, no changes were made in the curriculum and it remained the same as in 1907 with the same staff.

A. L. Melander was elevated to head of department of Zoology.

Eighteenth Annual Catalog (1909)

Head of Department - A. L. Melander, Professor

William T. Shaw - Professor of Zoology

Required courses for Entomology Majors:

Zoology 21 - General Zoology - Introduction to Zoology, taught by Shaw, 5 hour course.

Zoology 22 - General Zoology - Continuation of preceeding course, by Shaw, 5 hour course.

Zoology 4 - Systematic Entomology - Melander - 5 hours,
Text: Kellog's American Insects.

Zoology 4a - General Entomology - Melander- 5 hours .

Zoology 8 - Economic Entomology - Melander, 5 hours.

Zoology 13 - Biological Illustration - Melander, 1 hour.

Zoology 19 - Advanced Entomology - Melander, 5 hours.

Special problems as before designated as a full course.

Zoology 16 - Zoological Research - Original investigations of certain zoology and entomology problems.

Nineteenth Annual Catalog (1910)

Head of Department - A. L. Melander, Professor

W. T. Shaw - Professor of Zoology

Julius W. Kalkus - Instructor in Histology

Required courses for Entomology Majors:

Zoology 21 - Invertebrate Zoology 5 hours, General Zool. Shaw.

Zoology 22 - Vertebrate Zoology 5 hours, General Zool. Shaw.

Zoology 4 - Systematic Entomology, 5 hours, Systematic Entomology, Melander.

Zoology 18 - General Entomology, 5 hours, Folsom's Entomology, Melander.

Zoology 19 - Advanced Entomology, 5 hours Special Problems, Melander.

Zoology 20 - Advanced Entomology 5 hours, Zoology Problems, Melander.

Zoology 24 - Research in Zoology, 5 hours, Zoology Problems, Melander.

A foreign language required for graduation. Thesis has to be written as a requirement for graduation in all years preceding this as well as this year.

Elective Courses

Zoology 8 - Economic Entomology, 5 hours, Melander

Zoology 32 - Habits of Insects, Melander. Summer course.

Twentieth Annual Catalog (1911)

Head of Department - A. L. Melander

W. T. Shaw - Professor of Zoology

J. W. Kalkus - Instructor in Histology

Same courses as in 1910 offered in this year.

During the Summer Session, two courses in entomology were offered.

Zoology 2 - Elementary Entomology, Melander 4 hours.

Zoology 32 - Habits of Insects, Melander, omitted.

Zoology 25 - Photography, Melander, 2 hours.

Twenty-first Annual Catalog (1912)

Graduation requirements same as in 1910.

Courses offered in Entomology:

Zoology 4 - Systematic Entomology, 5 hours, Melander.

Zoology 18 - General Entomology, 5 hours, Melander.

Zoology 19 - Advanced Entomology, 5 hours, Melander.

Zoology 20 - Advanced Entomology, 5 hours, Melander.

Zoology 37 - Fruit Pests, 4 hours, Melander. Habits and control of fruit pests.

Zoology 38 - Crop Pests - 2 hours. Introduction to pests of agricultural crops. Melander

Zoology 39 - Insects and Disease, 1 hour, Melander. Discussion class.

Zoology 40 - Sprays and Spraying - Chemistry and action of sprays, Melander.

Zoology 1, 2 and 10 - three courses in Photography.

Summer Session

Zoology 4 - Systematic Entomology - Melander

Twenty-second Annual Catalog (1913)

Head of Department - A. L. Melander (absent on leave 1913-14)

W. T. Shaw - Professor of Zoology

J. W. Kalkus - Professor of Histology

Orilla E. Minor - Assistant in Photography

Graduation requirements same as before. Schedule same as in 1912.

No new courses. No entomology courses offered in Summer Session.

Twenty-third Annual Catalog (1914)

William O. Ellis, instructor in entomology replaced Melander who was absent on leave for one year.

Twenty-fourth Annual Catalog (1915)

Charles Harlan Abbot, replaced William O. Ellis; his title was Instructor in Zoology.

New courses added:

Zoology 43 - Introductory Entomology, 3 hours, "Fundamentals of structure, physiology," etc., Melander.

Zoology 8 - dropped from the records.

Zoology 1, 2, and 10 - Photography courses still given.

Twenty-fifth Annual Catalog (1916)

Abbot dropped from staff.

Twenty-sixth Annual Catalog (1917)

Zoology 21, 22, 24, 18, 19, 20 and a thesis must be completed before a degree in entomology is granted.

Zoology 43 - Agricultural Entomology formerly Introduction to Entomology, Melander.

No other changes in this year.

Twenty-seventh Annual Catalog (1918)

Anthony Spuler, listed as assistant entomologist, joined the staff.

B.S. degree in Entomology required Zoology 21, 22, 2, 4, 18, 19, 20 and in addition, 15 hours selected from the courses Zoology 7, 23, 24, Entomology 37, 38, 39, 40, and 5-10 hours of thesis.

Entomology Option

First year

Ent. 4 - Systematic Entomology

Ent. 18 - General Entomology

Second year

? - Applied Entomology

Zool. 44 - Heredity

Zool. 7 - Principles of Biology

Zool. 2 - Histology

Second year (cont.)

Bot. 1 & 2 - Botany

Third year

Ent. 19 - Special Ent.

Ent. 20 - Special Ent.

Bact. 1 - Bacteriology

Plant Path. - Plant

Pathology

Entomology Option (cont.)

Fourth year

Advanced Entomology major elective 10 hours

Total required hours $101\frac{1}{2}$. Total free elective $52\frac{1}{2}$ hours.

Entomology courses 4, 18, 19, 20, 37, 38, 39, 40, 43 same as previously described. Called Entomology courses instead of Zoology

Twenty-eighth Annual Catalog (1919)

One new course added.

Entomology 49 - Beekeeping - a practical course on the care of bees.

Entomology 19 called Special Entomology instead of Advanced Entomology.

Twenty-ninth Annual Catalog (1920)

H. A. Scullen, instructor in beekeeping.

Thirtieth Annual Catalog (1921)

Staff:

Head of Department - A. L. Melander
Professor of Zoology - William T. Shaw
Professor of Histology - J. W. Kalkus
Instructor in Photography - Orilla E. Miner
Assistant in Entomology - Anthony Spuler

Required courses for degree in Entomology:

Zoology 21, 22, 2 and Entomology 4, 18, 19, 24. Also electives such as Zoology 7, 23, 24, and Entomology 37, 38, 39, 40 and thesis 4 or 8 hours.

Entomology courses:

Ent. 4 - Systematic Entomology - Melander 4 hours.

Ent. 18 - General Entomology - Melander 4 hours.

Ent. 19 - Special Entomology - Melander, 4 hours, problems in histo-development, physiology, etc.

Ent. 20 - Advanced Entomology - Melander, 4 hours - continuation of 19.

Ent. 37 - Fruit pests - Melander, 3 hours.

Ent. 38 - Crop pests - Melander, 2 hours.

Ent. 39 - Insects and disease - Melander, 1 hour.

Ent. 40 - Sprays and spraying - Melander, 1 hour.

Ent. 43 - Agricultural Entomology - Melander, 2 hours.

Ent. 49 - Beekeeping - No teacher listed.

Photography 1 and 2 - Miss Miner, 4 hours.

Thirty-first Annual Catalog (1922)

Naomi George Argo - Fellow in Zoology and Entomology added to staff.

Photography courses dropped and all other courses remained unchanged in this year, as well as the requirements for degree in Entomology (Refer to year 1921).

Thirty-second Annual Catalog (1923)

Naomi George Argo, fellow in zoology and entomology, dropped from staff. O. S. Westacott gave 45,000 insect specimens to the collection. Melander donated his personal collection

of over 100,000 specimens to the insect collection.

Thirty-third Annual Catalog (1924)

Staff:

Head of Department - A. L. Melander, Professor of Entomology

Professor of Zoology - W. T. Shaw

Professor of Histology - Eugene A. Radier

Thirty-fourth Annual Catalog (1925)

No change in staff or curricula.

Thirty-fifth Annual Catalog (1926)

Staff:

R. L. Webster - Head of Department and Professor of Entomology.

Frank M. Null - Instructor in Zoology

John A. Haworth - Instructor in Histology

All entomology courses taught by Dr. R. L. Webster.

Ent. 49 - Bee Culture - Webster, 3 hours. "Fundamentals of Bee Culture." (Refer to 1921)

Thirty-sixth Annual Catalog (1927)

Staff

R. L. Webster - Head of Department

Dana J. Leffingwell - Assistant Professor of Zoology

John A. Haworth - Instructor in Histology

Requirements of B.S. degree in Entomology - Zoology 3, 4, 41, 42, 102, 111 and in addition, 12 hours selected from courses 101, 144, 145, 146, 147, 162 and 4 or 8 hours of thesis.

Zoology 3 (21)* Invertebrate Zool. - 4 hours - Leffingwell

Zoology 4 (22) Vertebrate Zool. - 4 hours - Leffingwell

Zoology 41 (18) General Ent. - 4 hours - Webster

*Figures in parenthesis are the old numbers of the courses and show the changes made by R. L. Webster.

Zoology 42 (4) Systematic Ent. - 4 hours - Webster

Zoology 102 (19) Ent. Research - 2-5 hours - Webster

2 years of Zoology required as prerequisite.

Zoology 111 (2) Histology & Cytology - 4 hours - Haworth

Zoology 101 (23) Zoological Research - 2-5 hours - Webster

Zoology 144 (37) Fruit Insects - 2 hours - Webster

Zoology 145 (38) Crop Pests - 2 hours - Webster

Zoology 43 Agricultural Entomology - 2 hours - Webster

Zoology 146 Principles of Insect - 2 hours - Webster
Control

Zoology 147 (39) Animal Parasites and Disease - 1 hours -

Webster (Elementary work in Entomology prerequisite)

Species effecting human health.

Zoology 162 (47) Genetics - 3 hours - Webster

Zoology 71 (49) Bee Culture - 3 hours - Webster

Thirty-seventh Annual Catalog (1928)

No changes in staff and no change in curricula or requirements for graduation.

Thirty-eighth Annual Catalog (1929)

Staff:

R. L. Webster - Head of Department

D. J. Leffingwell - Assistant professor in Zoology

F. E. Whitehead - Assistant Professor in Zoology

Hilton A. Smith - Instructor in Histology

Zoology 41 changed to 141 - Refer to 1927 curricula

Zoology 42 changed to 142 - " " " "

Zoology 103 - Seminar - 1 hour - Webster (Discussion of
Zoology and Entomology problems).

Thirty-ninth Annual Catalog (1930)

Staff:

John McA. Kater replaced Whitehead (refer to 1929)

Fortieth Annual Catalog (1931)

Staff:

Arthur Svihla - Assistant professor of zoology replaced
Leffingwell.

Zool. 102 - Advanced Entomology - Webster - Name of course
changed (see 1927)

Zool. 202 - Research in Entomology - Webster

Zool. 145 - Crop pests dropped from curricula.

Forty-first Annual Catalog (1932)

No change in staff

R. L. Webster - Head of Department
John McA. Kater - Assistant Professor of Zoology
Arthur Svihla - Assistant Professor of Zoology
Hilton Smith - Instructor in Histology

No change in Curricula (Refer to 1931)

Forty-second Annual Catalog (1933)

Staff:

R. L. Webster - Head of Department
Arthur Svihla - Assistant Professor of Zoology
Ronald F. MacLennan - Assistant Professor of Zoology
Hilton A. Smith - Instructor in Histology

Zool. 48 - Forest Entomology - first year to be given.

Forty-third Annual Catalog (1934)

Staff:

R. L. Webster - Head of Department, Professor of Entomology.

Arthur Svihla - Assistant Professor of Zoology
Ronald F. MacLennan - Assistant Professor of Zoology
Hilton A. Smith - Instructor in Histology
J. F. G. Clarke - Instructor

Zoology 48 - Forest Entomology - Identification and
control of shade and Forest tree pests - 3 hours - Webster

Forty-fourth Annual Catalog (1935)

Staff:

Mr. Van Vleet - Instructor Added to regular staff (see
1934)
Mr. J. F. G. Clarke - Instructor Added to regular
staff (see 1934).

Forty-fifth Annual Catalog (1936)

R. L. Webster - Head of Department of Zoology
Ronald F. MacLennan - Assistant Professor of Zoology
Arthur Svihla - Assistant Professor of Zoology
R. D. Shenefelt - Instructor in Zoology
George Van Vleet - Instructor in Zoology
J. F. G. Clarke resigned

Forty-sixth Annual Catalog (1937)

Staff:

R. L. Webster - Head of Department
R. F. MacLennan - Associate Professor
Arthur Svihla - Assistant Professor (on leave 1936-37)
A. S. Hyde - Instructor
R. D. Shenefelt - Instructor
George Van Vleet - Instructor

Forty-seventh Annual Catalog (1938)

Staff:

R. L. Webster - Head of Department
R. F. MacLennan - Associate Professor
Arthur Svihla - Associate Professor
R. D. Shenefelt - Instructor
F. S. Henika - Instructor

Forty-eighth Annual Catalog (1939)

Staff:

R. L. Webster - Head of Department
 R. F. MacLennan - Associate Professor
 G. E. Hudson - Assistant Professor
 F. S. Henika - Instructor
 R. D. Shenefelt - Instructor

Forty-ninth Annual Catalog (1940)

Staff:

R. L. Webster - Head of Department
 R. F. MacLennan - Associate Professor
 G. E. Hudson - Assistant Professor
 Leonard Wing - Assistant Professor
 R. D. Shenefelt - Instructor
 F. S. Henika - resigned

Fiftieth Annual Catalog (1941-42)

Staff

R. L. Webster - Head of Department
 H. L. Eastlick - Assistant Professor
 G. E. Hudson - Assistant Professor
 Leonard Wing - Assistant Professor
 R. D. Shenefelt - Instructor

Zool. 145 - Insect Morphology - 4 hours - Mr. Shenefelt.

Given in alternate years - 1941-42. Study and comparison of structures of insects. (New course)

Schedule of Studies (1941-42)

<u>Freshman Year</u>			
<u>First Semester</u>	<u>Hrs.</u>	<u>Second Semester</u>	<u>Hrs.</u>
Invertebrate Zoology	4	Vertebrate Zoology	4
Gen. Inorganic Chem.	4	Gen. Inorganic Chem.	4
English Composition	2	Agricultural Entomol.	2
Elective	4	English Composition	2
		Elective	3

Schedule of Studies (cont.)

<u>First Semester</u>		<u>Second Semester</u>	
	<u>Sophomore Year</u>		
General Entomology	4	Systematic Entomology	4
Histology	4	Intro. Systematic Bot.	4
Botany 5	4	English	2
English 8	2	Elective	6
Elective	2		
	<u>Junior Year</u>		
Entomol. Research	4	Entomol. Research	4
French or German	4	French or German	4
Genetics	3	Social Science	4
Elective	5	Elective	4
	<u>Senior Year</u>		
General Bacteriology	4	General Pathology	4
Elective	12	Elective	12

This schedule includes all courses required for a B.S. degree in Entomology.

Electives from which further work in Entomology can be chosen are as follows:

Zool. 48 Forest Entomology

Zool. 103 Seminar

Zool. 144 Fruit Insects

Zool. 146 Principles of Insect Control

Zool. 202 Research in Entomology

Work of economic entomology at Washington State College is covered in the section on Economic Entomology.

E.

THE DEVELOPMENT OF ENTOMOLOGY AT OREGON STATE COLLEGE¹

A study of the history of Entomology at this institution should begin nearly three-quarters of a century ago, before the era of land grant colleges. Corvallis college was established in this community in 1856. After two years, it passed to the control of the Methodist Episcopal Church, South. In 1868, the legislature of the state of Oregon adopted Corvallis college as the state agricultural college.

For convenience in this history, the school's past has been divided by the author into three periods. The first period embraces the years 1872 to 1888. It was in the latter year that Economic Entomology was first taught here. It was one year earlier, 1887, that the college was moved to its present location. The second period is from 1888 to 1914. During these years Entomology was an appendage to Zoology. The third and present period is from 1914 to the present, being characterized by the fact that Entomology was given recognition as a separate department. A fourth period might begin with 1932 when Entomology became a part of the school of Science instead of Agriculture.

¹ Generous acknowledgement is hereby made to Dr. Noal P. Larson for much of the material contained in this section.

In 1885 the church voluntarily relinquished its influence on the school and in 1887 the school moved to its new location, the present campus. The entire institution was housed in the administration building. The old location was at Fifth and Madison Streets at the present location of the Madison Street Methodist church.

In 1869, the year following the adoption as the state agricultural college, agriculture courses were offered. This was four years after Michigan State, the first in the nation. The course here was the first on the west coast. The first curriculum in agriculture was complete in 1873. It was a two-year course and was taught by Prof. B. J. Hawthorne. Entomology was included in the course, being taught in the third term of the second year. Hawthorne was also professor of languages, teaching German, Latin, and Greek as well as all his other subjects. He was a botanist by choice (according to J. F. Yates). He taught unassisted until 1884 when he left this campus. He taught at the University of Oregon for several years until his death. In 1906 he was still there, teaching Psychology.

The state of Entomology as such is a puzzle for the remainder of the first period.

The college catalog states that in 1885 Prof. Edgar Grimm taught Etymology (a natural science), it being for Sophomores.

Yates, who graduated in 1885, states that Grimm taught no Entomology, being Prof. of Agriculture and Chemistry. However, John Fulton, present professor of Chemistry, says that Grimm taught Entomology, and this was corroborated by E. R. Lake, professor of Botany and Horticulture. He taught it mainly as it affected Horticulture. Grimm and Lake were both graduates of Michigan state college. Grimm left the campus about 1890. He became a lawyer and practiced several years at Nome, Alaska, and recently lived at Salem, Oregon. It was he who planned and established the first campus drainage system here. The "Grimm alfalfa" referred to on the large sign at the first landing in the north stairs of the Agriculture building was not named for Edgar Grimm, but for a farmer in Minnesota. After leaving here, Lake was on the faculty at the Washington state college, edited a magazine called "Fruits and Flowers" at Portland, managed a prune orchard near Corvallis, was a member of the state legislature, and was on this faculty again, this time in Botany and Forestry.

Grimm was first director of the Agricultural Experiment Station. The Station was created July 2, 1885. In the first station bulletin¹ Grimm wrote that "the station will have facilities for identification of insect pests and study of the

¹ History & Organization of the Oregon Experiment Station, 1888.

best methods of protection against their ravages."

In 1887 W. N. Hull was professor of Zoology and the catalog of that year states: "Insect and animal life, particularly where they benefit or destroy, should be generally studied." Entomology was listed for the third term of the sophomore year and the second term of the third or junior year.

The pioneer professor of Beekeeping in the west was W. W. Bristow. From 1884 to 1894 he was professor of Bookkeeping, professor of Beekeeping and principal of the Preparatory department. "Old Bris" as Bristow was popularly called, was a native of Missouri. He had a natural liking to bees. He could work with them for hours, even in unfavorable weather without being stung. He worked without gloves or veil. He had an A. B. degree from a normal school in Missouri and had studied some about bees at that time. He was probably a banker in Missouri before he was elected to be a professor of Bookkeeping and principal of the Preparatory department at this school. In Corvallis, he established himself on Monroe Street at the corner of Tenth, where the home of E. E. Wilson now stands. He kept several beehives west of the house, where the Evangelical church now stands. The rest of the block up to Jackson Street was his farm. He kept buggy horses, did his own plowing and cut his own hay. He made an annual hunting expedition to get deer meat for the winter.

Having such a liking for bees, Bristow was made professor of Beekeeping and taught the fundamentals to interested students. The text for beekeeping in 1888 was "Bees and Honey" by Thomas G. Newman. Bristow's office and classroom was on the northeast corner of the second floor of the administration building. He taught the subject annually except in 1889, when his duties as principal of Preparatory School were too heavy to allow him any time for bees. He was able to teach Beekeeping later because the late Mrs. Ida B. Callahan of the English department was added to the staff as assistant principal of Preparatory. Bristow lectured to the students on the fundamentals and then gave them practical experience by caring for bees at his own apiary and for farmers who wished the work done. Fulton says he took the course in 1891 along with about fifteen other students. After the institution moved out to the hill, a small apiary was maintained as school property. It was located just northeast of where the library now stands.

Being a native of Missouri, "Old Bris" believed in linden trees as honey plants. He was habitually extolling the trees to all with whom he came in contact, in fact, he privately expressed his faith in lindens to everybody. He believed them to be the best honey producing plants available. He owned a seven-acre tract of land west of town (approximately at Thirty-fifth and Harrison Streets) and confided to everyone

that he would plant it all in lindens. His ambition was not realized, for in 1894 the Preparatory department was discontinued and Bristow went into the insurance business in Portland. He died there a few years later.

The second period begins in 1888 when F. L. Washburn arrived from the east. He was a graduate of Harvard, and was the first Economic Entomologist at this institution. He was a Zoologist by training with Entomology as his specialty. His title here was professor of Zoology and Entomology. He also served on the Committee on the Farmers' Institute. In 1889¹ Washburn taught Economic Entomology in the spring term for third year students. This marked the first course in Economic Entomology at this school and the beginning of the second period. The course included recitations, laboratory and field work. The text was Packard's Entomology for Beginners. There were five chief goals of the course: (1) to study insect anatomy, (2) classification, (3) collection and recognition (4) habits and life histories, and (5) the study of insecticides in the field. Washburn's office and classrooms were on the top floor of the east side of the Administration Building.

¹ All references to years imply school years, i.e., 1889 refers to the school year 1889-1890.

Washburn did not care for bees.¹ There was a school insect collection here in those days but it was not a well-kept one. Fulton and Charles L. Johnson, professor of Mathematics, both collected Lepidoptera which were placed in the collection as part of the class work.

Washburn taught Economic Entomology each year for the next five years.² In 1891 the experiment station became an actuality, and Washburn was appointed as Station Entomologist. The catalog for that year states that there was a zoological museum which included insects. The course in Economic Entomology was required of students in agriculture and household economy. The 1892 catalog states that the biology laboratories of this institution were by far the best in the northwest. The catalog of 1893 states that three boxes of Oregon insects which had been exhibited at the state fair were placed in the museum.

Washburn left after 1894. He was at the University of Oregon for a few years and then went to Minnesota, where he

¹ Through Cordley's influence an insectary was erected in 1899. It was a glass house about 12x16 feet. It contained several cages and was used in life history studies. It was an unsuccessful proposition because, due to its glass construction and lack of facilities, it was impossible to maintain constant temperatures. It was the target of considerable fun, being commonly called the "bug house". It stood for about eleven years, or until 1910 and was located just west of the administration building about midway to the road.

² 1890 through 1895.

became State Entomologist and gained distinction in that capacity.¹

In 1895, Arthur Burton Cordley came to take the place of Washburn as professor of Zoology and Entomology and Entomologist of the station council.

Cordley had graduated from Michigan state in 1888, specializing in Entomology. He spent two years more there as an Assistant and then served as Assistant State Entomologist of Vermont for one year. In 1891, he went into the old Division of Entomology in Washington, D. C., as Assistant Entomologist to Thomas Pergande. In 1893, during his vacation, he was Entomologist on a scientific expedition to the Arizona desert. He claimed the two years he was at Washington was very valuable experience for him. He then returned to his home in Michigan, got married and started farming. As the nation was in the midst of the business depression of 1893, his farming efforts were not successful. He went back to Michigan State college as an Assistant in Horticulture. He was hardly established when he received a wire that he had

¹ According to Prof. Fredrick Berchtold, of the English department, Washburn's most cherished memory was a trip to the French Marquesas Islands, where he was sent to collect insects by the governor of Minnesota. Washburn died in 1927.

been elected to the professorship and office of Entomologist of Oregon at a salary of \$1500 per year. He hastily made the trip and two days after arriving here in September, 1895, he met his first classes in this institution.

Cordley's classrooms were on the third floor of the administration building at the north end. There were two rooms and a closet. One room was office and laboratory. The other was classroom and museum for Zoology, Entomology, and Physiology. The insect collection was not a workable one so Cordley set out to build it up. He had had a large personal collection but had sold it to the University of Vermont on leaving the East. He swung his bug net to and from his work daily for the first year.¹ Then it was necessary to spend much of the time mounting and classifying the specimens. To this collection he added about 5,000 specimens he had collected in Arizona.

In 1895, Zoology, Entomology, and Physiology were required of all students except engineers. That year Cordley taught one course in Entomology. The term's work was divided

¹ By 1901, the college Zoological museum possessed the largest collection of Oregon insects in existence, according to the catalog of that year.

into halves, the first dealing with insect structure and classification, the second treating of Economic Entomology. In 1896, the course "Entomology" was given again and also Advanced Entomology. This was for major work in a chosen field. In 1897, Cordley was assisted by S. C. Brown, but Brown had nothing to do with Entomology.¹ Cordley taught the same two courses again in 1898. In 1899, Brown was replaced by F. M. McElfresh, who had specialized in Entomology at Illinois. McElfresh remained here only two years, 1899 and 1900. He and Cordley taught the two previous Entomology courses.

In following the class schedule we have passed up Cordley's Experiment Station work for which he gained wide recognition. During those few short years he had made three important discoveries: First, the life history of the codling-moth under Oregon conditions and a successful method of spraying for its control in the northwest; second, the cause of apple tree anthracnose and a method of its control by the use of a Bordeaux mixture; third, a control for apple scab by the use of lime sulfur spray, a method now in universal use.

¹ The 1897 Catalog states that Master's Degrees might be granted in Zoology.

Cordley was Station Plant Pathologist in addition to his duties as Entomologist and Zoologist and with two student assistants was spraying for San Jose Scale in an orchard out on Arnold Way, and more or less accidentally discovered the control of the apple scab. He was also first to determine the cause of the anthracnose.

In 1901, W. T. Shaw became instructor of Biology, replacing McElfresh. Cordley continued teaching the Advanced Entomology, which since 1899 was given all three terms. Shaw taught the basic course.¹ In 1902, the same courses were given by the same staff but the department of Zoology and Entomology occupied six rooms on the third floor of the Chemistry or Science building, called Ag Hall at that time. There were no changes in 1903. In 1904 and 1905 there were no changes, but in 1906, J. C. Bridwell replaced Shaw and the same courses continued until 1908.

Bridwell, nicknamed "Bridy", was a jack of all trades who, although he taught Entomology, was really a zoologist with wide interests. After he left here in 1910, he became Assistant Entomologist in California (1910-1913), and later worked in the National Museum at Washington, D. C.

¹ Comstock's "Manual for the Study of Insects" was used as a text.

In 1908, Cordley became dean of agriculture. By this time a group of graduate students in Entomology were on the staff besides Cordley and Bridwell. C. C. Cate was assistant in plant pathology, F. C. Ewing was assistant in Entomology, and Miss Laura Hill was assistant in Zoology and Entomology. Cordley taught a course on Crop Pests.¹ Bridwell gave General Entomology and Advanced Entomology, but was assisted in the laboratory by Miss Hill. Ewing and Cate were both in the experiment station.

In 1909, Miss Hill and Cate were not on the staff. The same three courses were given and Seminar was added, which has been given almost continuously since that time. The first year it was combined with plant pathology but has been separate since then. In 1910, Cordley was Professor, Miss Alice Leora Edwards was an Instructor in Zoology,² and H. F. Wilson was an instructor, taking most of the responsibility for the teaching of the three former courses.

In 1911, Cordley quit teaching Entomology. Wilson became Assistant Professor and directed the teaching of Entomology. V. I. Safro was a Station Assistant, as was

¹ A two year course on insects and fungi attacking crops

² Miss A. L. Edwards also presumably assisted in Entomology.

Dr. H. E. Ewing. A. L. Lovett was a Research Assistant and helped with instruction. G. F. Sykes was Instructor in Zoology. Wilson taught Introductory Entomology, Bee Culture, and Forest Entomology. Lovett taught Entomology of Orchard and Small Fruits. Wilson left after 1916 and served for years at Madison, Wisconsin, as State Entomologist. The same three courses were given the next two years and in 1913, Entomology of Field Crops was given by Lovett.

Beginning with 1914, Cordley became Director of the Experiment Station, a position he held until 1920. He held the position of Dean of Agriculture until 1931 when he was honored for his long service by being made Dean Emeritus. Also in 1914, Entomology became a separate and distinct department from Zoology. Sykes became Professor of Zoology and Wilson Professor of Entomology and Entomologist of the Experiment Station. W. J. Chamberlin was added to the staff in 1915 and remained until 1941 when he was called into army service. He had studied forestry and began teaching Forest Entomology in 1916. G. F. Moznette, L. R. Childs, and L. G. Gentner were Research Assistants in the station. In 1918, F. H. Lathrop replaced Moznette and in 1919, B. Black and B. B. Fulton were added to the staff. The former two were teachers but Fulton's work was confined to the Station.

The staff in 1920 included Lovett, who had been Professor and Entomologist since 1917, Chamberlin, Lathrop, and H. A. Scullen. Scullen has been on the staff since that time. Lathrop left in 1922 and D. C. Mote came in 1923, and has been here since then. Since the death of Lovett in 1924, Mote has been Professor and State Entomologist.

In 1925, the Experiment Station, under the direction of Chamberlin, made the first airplane dusting experiment in the west. The experiment was made at the Oaco apple orchards at Monroe with the cooperation of the U. S. Army Air Force. The experiment was satisfactory.

A. Burr Black held a Research Fellowship in Entomology in 1917-1918, was Assistant Entomologist in 1919, and resigned shortly thereafter. He returned in 1937 and remained until 1939 as a Graduate Assistant. Since that date he has been State Apiary Inspector.

John Emerson Davis has acted as Graduate Assistant and Assistant Entomologist since 1937. He is a candidate for a Doctor of Philosophy Degree.

Daniel Ernest Bonnell was brought from the University of Washington in 1939 to act as Graduate Assistant and Artist, and also as Assistant Entomologist. When W. J. Chamberlin obtained a leave of absence in 1941 to serve with the Army,

Bonnell was appointed as Instructor in Entomology. He was the Department's first candidate for a Doctor of Philosophy degree.

Richard Lewis Post, former Head of the Department of Entomology of Wards Biological Supply House of Rochester, New York, came to the Department in 1941 as Technician and Curator. He motivated the formation of the Oregon Entomological Society, and greatly aided in bring the Departmental collection to its present high standard. Post is a candidate for a Doctor of Philosophy degree.

Experiment Station workers since 1920 include: Dr. B. G. Thompson, G. R. McGinnis, Joseph Wilcox, F. R. Cole, S. C. Jones, Howard Stearns, W. D. Edwards, Kenneth Gray, R. E. Dimick, D. G. Gillespie, Joe Schuh, H. E. Morrison, R. G. Rosensteil, and Dr. George Ferguson.

Federal Cooperators include: L. P. Rockwood, A. O. Larson, F. G. Hinman and J. C. Chamberlin.

Industrial Fellowships have been granted to J. D. Vertrees, S. E. Crumb, Jr., and R. G. Rosensteil.¹

¹See Section on Biography for additional data on men mentioned above.

LIST OF MASTER'S THESES

OF

ENTOMOLOGY DEPARTMENT

- 1913 Wilson, Harley Frost
 A list of the aphididae of the world, with
 host plants. 235 p.
- 1918 Maris, W. Homer
 A brief study of the history of entomology.
 67 p.
- 1921 Chamberlin, Willard Joseph
 A catalogue of the Buprestidae of the United
 States and adjacent territory. 471 p.
- 1924 Thompson, Benjamin Garrison
 The Aegeriidae of the Pacific states. 49 p.
- 1925 Stearns, Howard Cecil
 The European earwig--its life history,
 habits and natural enemies. 89 p.
- 1928 McGinnis, Guy Robert
 Life history, habits, and control of the
 Indian meal moth *Plodia interpunctella* hbn.,
 order Lepidoptera, family Pyralidae. 52 p.
- 1929 Hills, Orin Ancil
 Life history and habits of the strawberry
 crown-moth *Aegeria rutilans*, Hy. Edw. 77 p.
- 1930 Allen, Thomas Cort
 A study of the economic status of the
 ringed-neck or Chinese pheasant in Oregon. 67 p.
- 1930 Gillespie, Douglas Grayson
 The commercial propogation (!) and bio-
 logical studies of two parasites of the codling
 moth. 108 p.
- 1931 Dimick, Roland Eugene
 Digonichaeta setipennis Fall. A Tachinid
 parasite of the European earwig, with a study
 of its introduction, biology and laboratory methods
 used in rearing in Oregon. 118 p.

Masters' Theses (cont.)

- 1931 Johnson, Philip Cornwell
The American species of the genus *Ellopia* (Lepidoptera) with special reference to *Ellopia somniaria* Hulst. 55 p.
- 1932 Vaughan, Edward Kemp
Studies of the crinkle disease of strawberry, with special reference to its transmission. 26 p.
- 1932 Yates, Willard Wilson
A study of the effect of accessory substances on the adherence of lime sulfur spray to the integuments of insects. 30 p.
- 1933 Henry, Harold H.
On weed, disease and insect control in lawns and turfs. 54 p.
- 1933 Wong, Kwan Lun
Tingids of economic importance in Oregon with special reference to the western willow tingrid, *Corythuca salicata* Gibson. 47 p.
- 1934 Roaf, James Richardson
Some observations on the life history and bionomics of the holly scale, *Aspidiotus britannicus* newst. in Oregon 48 p.
- 1935 Gray, Kenneth Wiesner
Some observations on the Bionomics of *Microbracon nevadensis* (Ashmead). 128 p.
- 1936 Edwards, William Donald
Biology of *Cnesphasia longana* Haworth, an insect pest of several important crops in Oregon. 61 p.
- Evenden, James Cawston
Effects of defoliation by the pine butterfly (*Neophasia menapia* Felder) upon Ponderosa Pine. 37 p.

Masters' Theses (cont.)

- 1936 Gjullin, Claude Melvin
The female genitalia of the Aedes mosquitoes of the Pacific Coast states. 36 p.
- Larson, Noal P.
The hop aphid, Phorodon humuli (Schrank) and its control in the Willamette Valley. 66 p.
- Schuh, Joe
A contribution to the knowledge of the Odonata of Oregon. 213 p.
- 1937 Crowell, Hamblin Howes
A contribution to our knowledge of the bionomics of Digonichaeta Setipennis fall, a Tachnid Parasite of the European Earwig. 76 p.
- 1938 Crawford, Eugene Edward
A study of the food habits of waterfowl in the Willamette Valley. 35 p.
- Hsiao, Tsai Yu
Investigation of the life history and habits of the cherry case-bearer, Cleophora pruniella Clemens and the cigar case-bearer C fletcherella Fernald, in the Willamette Valley. 53 p.
- Leung, Yuk Maan
A general study of the mint flea-beetle, Longitarsus waterhousei Kutsch. 30 p.
- 1939 Black, A. Burr
History and distribution of bee diseases in Oregon 42 p.
- Davis, John Emerson
Pterophoridae of Oregon (Plume moths of Order Lepidoptera). 73 p.
- Ferguson, George Ray
Laboratory studies on the effectiveness of insecticidal materials against Diabrotica soror Leconte. 66 p.

Masters' Theses (cont.)

- 1939 Kaloostian, George Hagop
Life history and control of the grape leaf
folder in the San Joaquin valley, California.
32 p.
- Rosenstiel, Robert George
Life history and morphology of Cremona
cotoneastri Busck (Cotoneaster webworm) Order
Lepidoptera. 38 p.
- Tarshis, Maurice Steinmetz
The culture of surgical maggots and clinical
aspects of maggot therapy. 164 p.
- 1941 Morse, John Salls
Foods of the ring-necked pheasant on Pro-
tection Island, Washington
- Swisher, Ely Martin
Observations on some western Oregon mites,
with special reference to the Oribatoidea.

PH. D. THESIS

- 1941 Bonnell, Daniel E.
Some Factors in the Development of North-
western Entomology.

Entomology Courses Offered at Oregon State College¹

1890-1891

Economic Entomology - In Economic Entomology the student becomes thoroughly familiar with the structure of a typical insect by dissections in the laboratory, and then, with this as a foundation, studies the classification of insects. In this course each student is taught how and is required to make a collection of the more common insects of the State, with special reference to injurious and beneficial forms; is made familiar with the habits and life histories of insect pests of the orchard and farm, and the best means of exterminating the same. In the field each student will, under the instructor's direction, learn how to work with insecticides and will be required to carry on experiments to discover the best means of preventing insect ravages.

1892-1893

Zool. 4 - Economic Entomology - the same description as above only that a collection of 300 insects is also required.

1894-1895

Zool. 6 - Econ. Ent. Formerly Zool. 4.

1895-1896

Entomology

a. Structural and Systematic - The fore part of the term is occupied in dissecting some typical insects to get a working knowledge of insect anatomy, and later the student is required to collect, and properly mount and label, a series of insects representing the principal orders, and to classify them as far as possible.

b. Economic - On the principal insect pests of the farm, garden, orchard, and house, and on the most approved methods of combatting them. The work is illustrated by a small but rapidly growing collection of Oregon insects and by numerous insecticide preparations, spray pumps, etc.

¹ Taken directly from the Catalogs (by year) of Oregon State College.

1896-1897

Zool. 4 - Entomology - Laboratory work on structure of insects, with practice in collecting and mounting them. Lectures on injurious insects and insecticides.

Zool. 7 - Advanced Entomology - Students electing this course will select some particular insect, or group of insect pests, for their major work.

1899-1900

Zool. II - Entomology - A study of the structure, classification, and habits of insects, with particular reference to those which are beneficial or injurious. Instruction is given in methods of collecting, mounting, and studying the life histories of insects and in the preparation and use of insecticides.

Zool. VI-c - Advanced Entomology - A laboratory study of some restricted group of insects, of some particular species of economic importance, or of the insects affecting some particular crop. In this case the students have full access to the collections and the library and records of the experiment station.

VII-b - A continuation of VI-c

VII-b - A continuation of VI-c, and VII-b

1908-1909

Zool. 6 - General Entomology - An introduction to the study of insects with special reference to economic forms. Agriculture students may give chief consideration to those species which are destructive to farm crops or which are parasitic upon domestic animals; horticulture students may consider the insects of the orchard; while domestic science and art students study the life history and habits of mosquitoes, flies, and cock-roaches, ants, carpet-beetles, clothes moths, and other household pests or those which prey upon the plants of the vegetable or flower garden. In all cases preventive and remedial measures are given consideration. The lab work consists of a preliminary study of the anatomy of the grasshopper with comparative work in collecting, and lab work in properly mounting and classifying insects, is provided to make the student

familiar with the principal orders of insects. The course thus becomes at once an elementary course in economic entomology for those who can pursue the subject no further, and an introductory course for those who desire to specialize in this branch of science.

Zool. 7 - Advanced Entomology - This course is designed for those who desire to specialize in Entomology. The instruction includes lectures and reference reading upon the biology of the principal families of insects supplemented by laboratory studies of typical life histories. Considerable time is devoted to studying the habits of insects, particularly injurious species, in the field; to collecting, rearing, mounting and classifying them; and to becoming proficient with entomological methods and literature.

Zool. 8 and 9 - Advanced Ent. - Adv. Ent. Continued. In connection with courses 7, 8, and 9 the student will be required to present a thesis detailing the results of a systematic study of some restricted group of insects or of the biology of some particular species or group of species.

Zool. 10 - Crop Pests - A course of lectures, laboratory, and field observations upon the chief insect pests, fungus and other diseases of cultivated crops. Instruction and practical work is provided in the preparation of sprays and in the use of various types of spraying machinery, fumigation and other approved methods of reducing the losses from the various crop pests. The course is designed to furnish the student with that practical information which experience has shown is most often desired by farmers or orchardists.

Zool. 11 - A continuation of Zool. 10

1909-1910

Zool. 10	-	formerly	Zool. 6
" 11	-	"	" 7
" 12	-	"	" 8
" 13	-	"	" 9
" 14	-	"	" 10
" 15	-	"	" 11

Zool. 16 - Beekeeping - A brief course in the principles of beekeeping with practical work in the apiary. Special attention will be given to the relation between beekeeping and orcharding.

1909-1910 - continued

Zool. 17 - A continuation of Zool. 16.

Zool. 18 - Seminar - Senior and graduate students in Entomology and Plant Pathology. Reading, discussing, and abstracting the leading articles upon Entomology and Plant Pathology as they appear in the scientific journals, horticultural press, current magazines, and experiment station literature.

Zool. 19 - A continuation of Zool. 18.

1910-1911

Zool. 8 - Introductory Entomology - An introduction to the study of insects by lectures, laboratory work, and field exercises. The lab work consists of a preliminary study of the anatomy of the grasshopper with comparative work upon other types. Sufficient field work in collecting, and lab work in properly mounting and classifying insects, is provided to make the student familiar with the principal orders of insects. In this and succeeding courses in Entomology the rearing of economic and other forms is carried on parallel with other work to gain familiarity with the development and habits of insects. Each student is required to familiarize himself with the life history, habits, and means of controlling some insect of economic importance.

Zool. 9 - Entomology of Orchards and Small Fruits - An intensive study of the more important insect enemies of the apple, pear, prune, plum, cherry, currant, gooseberry, bramble fruits and strawberry, and the critical examination of the methods to be employed in combating them. Each important pest will be studied in the field and lab with the view to becoming thoroughly familiar with the appearance of the insect and its work in all its stages of development.

Zool. 10 - Entomology of Truck and Field Crops - A similar intensive study of the insect enemies of celery, onions, beets, cabbage, kale, clover, vetch, potato, hops, corn, wheat, and oats.

Zool. 11 - Forest Entomology - Study of the insects destructive to forest trees and forest products, and the insect enemies of reforestation and the measures by which the injuries may be avoided or reduced.

1912-1913

Zool. 301	-	Formerly	Zool. 8
" 302	-	"	" 9
" 303	-	"	" 10
" 304	-	"	" 11
" 305	-	"	" 12
" 306	-	"	" 13
" 307	-	"	" 14
" 308	-	"	" 15
" 309	-	"	" 16
" 310	-	"	" 20
" 311	-	"	" 21

Zool. 312 - Problems in Forest Entomology - This course will include the study and application of methods of forest insect investigations. Each student will be assigned a practical problem in forest entomology to work out under direction.

Zool. 313 - A continuation of Zool. 312

1913-1914

Zool. 315 - Entomology of Field Crops - Similar to Zool. 303, but devoted to a discussion of the insect enemies of field crops and their control.

1914-1915

Ent. 317 - Household Entomology - A study of insects in their relation to pharmacy and to the household. The history and development of insects in medicine, insects in relation to disease, and insect pests of dwellings and stores. Control methods will be taken up in detail. This course is intended to prepare students in Pharmacy and Home Economics intelligently to understand the relation of insects to the household and the community, and the principle underlying methods of control.

1917-1918

Ent. 316 - Insect Taxonomy - An intensive study of the systematic groupings of insects; insect ecology as allied to taxonomy.

1917-1918 - continued

Ent. 317, 318 - Advanced Thesis and Research Methods.

1919-1920

Ent. 301 - Principles of Economic Entomology - Designed primarily for general agricultural students. A consideration of typical economic forms of insects in the principal orders and more important families, and of the principles of insect pest control.

Ent. 303 - General Entomology - Collection, preservation, and elementary classification of insects. In field collecting, the economic aspects are emphasized. Life history studies, the use of breeding cages, and practice in compiling field and laboratory notes receive attention.

Ent. 404 - Advanced Economic Entomology - An intensive consideration of specific insect pests of farm, garden, and orchard, particularly of the Northwest, and their control; latest developments in insecticides and their uses.

Ent. 321 - Forest Entomology - An intensive study of insects injurious to forests and forest products, forest insect surveys, and the principles of forest insect control.

Ent. 422 - a continuation of Ent. 321.

Ent. 331 - Beekeeping - A practical course in actual apiary manipulations designed primarily for students interested in horticulture. The College has a small apiary where the simpler manipulations may be mastered. Trips are made to commercial apiaries for the benefit of those interested in commercial beekeeping.

Ent. 351 - Insect Morphology - A study of the fundamentals of external, internal, and comparative morphology of insects including adaptive structures and their utility, and wing venation. Especial attention is given to structures used in classification.

Ent. 452 - Insect Ecology - A study of insects in relation to their surroundings, considering the interrelations of insects with each other and with other animals, and plants; influence of climate and other natural phenomena upon the distribution and activities of insects and application of these factors to Economic Entomology.

1919-1920 - continued

Ent. 453 - Insect Taxonomy - The collection, preservation, and classification of insects of the several orders; intensive study of insects of selected groups; attention to phylogenetic relationships and distribution.

Ent. 473 - The Teaching of Entomology - Designed primarily for high school teachers. The principles of entomology including materials and methods.

Ent. 481, 482, 483 - Seminar - Reading, discussing, and abstracting of the leading articles of entomological topics as they appear in current scientific literature.

Ent. 691, 692, 693 - Advanced Thesis and Research Methods - A course offered only to graduate students. Students select problems in applied entomology; problems in insect ecology; monographic problems, etc.; emphasis on methods in research.

Ent. 14 - Injurious Insects:- A practical course in Entomology, including life history, habits, and control of insects of farm, garden, and orchard.

1921-1922

Ent. 131, 132, 133 - Commercial Bee Culture - Designed primarily for the student who contemplates taking up honey production as an occupation. The course includes a study of the selection and preparation of equipment; the biology and life history of the honey bee; honey flora; fall, winter, spring, and summer management; marketing; disease control.

Ent. 231, 232, 233 - Advanced Commercial Bee Culture - Designed for students preparing for educational work in bee culture, inspection work, or extensive honey production. The course includes a study of apiary management, queen rearing, disease control, inspection work, etc.

Ent. 13 - Vocational Bee Culture - Designed to meet the needs of the bee keeper who desires to improve his technique and increase his knowledge of commercial bee culture. Includes equipment, manipulation, disease control, queen rearing.

1922-1923

Ent. 422 - Forest Entomology - A continuation of Ent.321

1924-1925

Ent. 423 - Advanced Forest Entomology - An intensive study of the bark beetles injurious to forest trees.

Ent. 424 - Forest Insect Problems - Research work on special problems relating to forest insect control; life history problems; preparation of bibliographies, etc.

1927-1928

Ent. 321 - Principles of Forest Entomology - A consideration of the economic forest insects, their habits, how they live, the damage they do and how this damage may be prevented and the insects controlled.

1929-1930

Ent. 101 - Insects of the Farm, Garden, and Orchard - A condensed course. The important pests of farm, garden, and orchard, and methods of control.

Ent. 301 - Entomological Field Work - Field work performed between sophomore and junior years, or between junior and senior years in connection with some State or Federal service; a written report based on an approved outline.

Ent. 324 - Entomology for Engineers - Designed to acquaint Engineering students, who will deal with timbers, lumber, and wood products, with the defects in wood caused by insects and how to combat them.

Ent. 405 - Principles of Insect Control - Pests of special groups such as fruit insects, truck crop insects, insects affecting man and animals, greenhouse and field crop insects; control measures and principles.

Ent. 451 - Insect Morphology - Anatomy, histology, embryology, and postembryological development of insects, with technique in histological methods as applied to insects.

1929-1930 - continued

Ent. 454 - Insect Taxonomy - Identification and classification of special groups of insects with practice in collection, preparation, and technique involved.

Ent. 461, 462, 463 - Special Studies - For students specializing in Entomology. Investigation of special problems or advance studies not included in regular courses.

Ent. 694, 695, 696 - Graduate Thesis - Prosecution of special studies by graduate students and preparation of thesis for advanced degree.

1930-1931

Ent. 321 - Prin. of Forest Ent.- (change of subject) - A general introduction to entomology for Forestry students. A survey of the forest losses due to insects; the groups responsible and a consideration of typical examples of the various groups and methods of control.

1932-1933

Ent. 352 - Entomological Literature and Nomenclature - A survey of rules, regulations, and practices in entomological nomenclature; the International Code; sources of entomological literature; Bureau of Entomology; periodicals and books; bibliographies.

Ent. 353 - Historical Entomology - The insects of the ancients; early works on entomology; beginnings in America; early entomological workers in America; introduced pests; development of the Bureau of Entomology; early work in Oregon.

1933-1934

Ent. 201, 202, 203 - General Entomology - Designed as basic instruction for students planning to take a major or a minor in entomology. Elementary work in morphology, taxonomy, general technique, and biology of insects.

Ent. 223 - Elementary Entomology - Designed primarily for prospective teachers of high school biology and others interested in insects from the biological point of view. Insects

1933-1934 - continued

in their relation to human welfare, their collection, preservation, classification, and the rearing of living forms are emphasized. Laboratory work includes field trips.

Ent. 471, 472, 473 - Advanced Entomology - First term, insect morphology - anatomy, histology, embryology, and postembryonic development. Second term, insect physiology - life processes of insects. Third term, insect ecology - environmental factors and their influence on insect development and distribution.

1935-1936

Ent. 351 - Insect Morphology - A study of the fundamentals of external, internal, and comparative morphology of insects, including adaptive structure and their utility, and wing venation. Especial attention is given to structures used in classification.

1936-1937

Ent. 341 - Aquatic Entomology - Studies involving the classification of aquatic insects, their ecologies, life histories and economic importance as food of game fishes. Emphasis is placed upon the technique of conducting lake and stream surveys.

1937-1938

Ent. 224 - Elementary Entomology Laboratory - Designed as a lab course to accompany Ent. 223. Field trips and lab work acquaint the student with the habits, methods of study, and classification of the more common forms of insects.

Ent. 236 - Practical Bee Culture Laboratory - Designed to accompany Ent. 235; to give practical training in the assembling of equipment and the management of bees for honey production or the pollination of crops.

1938-1939

Ent. 373 - Entomological Technique - Designed to acquaint the student with the methods of rearing living insects, collecting and preserving insects and the preparation of insect

1938-1939 - continued

material for study. For major students in entomology and for prospective teachers of biology. The laboratory work is adapted to the need of the student.

1940-1941

Ent. 411 - Fruit Insects - Major fruit insects and their control. Especially for students in horticulture and entomology.

Ent. 412 - Medical Entomology - Brief consideration of the men instrumental in the study that gave rise to medical entomology; ways in which disease is transmitted by insects; insects responsible for diseases of man; more common disease parasites, their carriers, and possible means of prevention and control.

Ent. 431 - Biological Control - Brief history of those who started this work, its possibilities and limitations; groups of insects that lend themselves to artificial propagation, examples of successes and failures, study of typical species in the various groups.

Ent. 471 - Insect Morphology - Fundamentals of external and internal morphology and the adaptation of parts to their functions; histology, embryology, postembryonic development and wing venation.

Ent. 472 - Insect Physiology - Life processes of insects, including nutrition, respiration, circulation, excretion, and reproduction.

Ent. 473 - Insect Ecology - Environmental factors and their influence on insect development, distribution and behavior.

Appendix to Section E

1890 to 1927 O.S.C. known as Oregon Agricultural College.

1927 to 1933 Known as Oregon State Agricultural College.

1933 to present - Known as Oregon State College

1890 - Entomology was included under the Department of Zoology
and Entomology.

1896 - Entomology was included under the Department of Zoology,
Entomology, and Physiology.

1899 - Entomology was included under the Department of Zoology.

1908 - Entomology was included under the Department of Zoology,
Entomology, and Physiology.

1914 - Entomology was raised to the status of Department of
Entomology.

It is apparently necessary, in a work of this sort, to attempt some evaluation of the institutions mentioned. The University of Washington had a pioneer status in entomology, chiefly based on the exploits of the Young Naturalists, O. B. Johnson and Trevor Kincaid. More recently, the teaching of entomology and the training of students has fallen on M. H. Hatch. Hatch is the northwest's premier taxonomist and his graduate students have written splendid taxonomic papers. Except for one or two good papers however, economic work has been largely ignored.

The University of British Columbia is a relative newcomer, and while under Dr. Spencer some admirable work is being accomplished, entomology in that institution cannot compare as yet with some of the others.

The University of Idaho has had an excellent history in entomology. The small separate Department of Entomology is functioning very efficiently under Dr. Shull.

Washington State College combines zoology and entomology, but the Department under Dr. Webster offers excellent training and courses in entomology.

Oregon State College offers more courses in entomology than does any other northwestern institution. Special emphasis is laid upon remunerative field work for entomology majors.

The Staff is large, competent, and facilities are good. The Department enjoys national recognition and ranking. Both instructional and experiment station work are under the direction of Dr. D. C. Mote. Emphasis, too, is laid on Agricultural, Forest, and Apiary entomology. Graduate students are expected to become proficient in their chosen field under the direction of the Specialists on the Staff.

Work on economic entomology is covered in the section on Economic Entomology.

III.

ENTOMOLOGICAL SOCIETIES IN THE NORTHWEST

Presumably, societies will bud whenever men of like interests get together. The northwest has proven no exception to this rule. Numerous small societies, composed of naturalists--and in particular of those persons interested in insects--have waxed and waned in this area. Some were so small that they soon passed out of existence. At least one large one, the Young Naturalists' Society, became defunct. However, several entomological societies are flourishing at the present. There are a number of scientific societies in the northwest which include occasional talks on insects, but these few brief instances are not of sufficient importance or interest to come within the modest scope of this paper. Several large ones, however, are worth of mention in some detail.

A. The Young Naturalists' Society (1879-1905)¹

The Young Naturalists' Society was an organization founded in December, 1879, in Seattle, and devoted to the study

¹ The bulk of the material on the Young Naturalists' Society has been very kindly furnished by Dr. M. H. Hatch of the University of Washington, and was made from direct perusal of the records of that organization as preserved in the Washington State Museum in Seattle.

of natural history. The society had a functional demise about 1900, although this cold fact did not occur to the members until 1905. Shortly thereafter, its library and collections were turned over to the University of Washington.

The society was extremely important because it represented the first endemic study of natural history in Washington territory and filled the gap between early day visiting naturalists and the organization of competent scientific departments at the University.

The society meetings were supposedly scheduled weekly but 37 meetings in 1880 and 32 meetings in 1895 are the most recorded in any individual years. An average of ten or twelve meetings were held yearly, with more meetings in the early years and fewer in the later ones.¹ A total of 278 meetings are recorded in the minutes of the organization.

¹ The records of the Society indicate the following years, meetings, and approximate number of members: 1880, 37 meetings, 18 members; 1881 24 meetings, 23 members; 1882, 28 meetings, 23 members; 1883, 24 meetings, 25 members; 1884, 18 meetings, 22 members; 1885, 21 meeting, 17 members; 1886, 12 meetings, 20 members; 1887, 4 meetings, 17 members; 1888, 3 meetings, 17 members; 1889, 0 meetings, 17 members; 1890, 10 meetings, 21 members; 1891 4 meetings, 19 members; 1892, 2 meetings, 16 members; 1893, 1 meeting, 16 members; 1894, 16 meetings, 38 members; 1895, 32 meetings, 41 members; 1896, 19 meetings, 38 members; 1897, 4 meetings, 32 members; 1898, 13 meetings, 30 members; 1899, 3 meetings, 12 members; 1900, 1 meeting; 1904, 1 meeting; 1905, 1 meeting.

The society functioned for approximately twenty years and had a total membership of about ninety persons. The members were elected to active or associate status. In addition to the above, ten others were elected to honorary or corresponding membership. Nearly a third of those elected seem never to have taken part in the activities of the society and there is reason to believe that many were not initiated or at least the records indicate that they had paid no initiation fee. Possibly not more than twenty-five members acted as the functioning nucleus of the group. The attendance of members actually at the meetings rarely numbered more than eight or nine, and thirteen was the highest number recorded.

Dues were set at twenty-five cents per month and later increased to fifty cents per month.

In 1885, some of the members raised, among themselves, \$1965 for the construction of a clubhouse.¹ In 1895, the

¹ According to the records of the Society these were: Charles L. Denny, Capitalist and son of A. A. Denny, one of the founders of Seattle; P. Brooks Randolph, Seattle bailiff; Edmond S. Meany, later Professor of History at the University of Washington; J. Edward Chilberg, banker; Benjamin A. Starkey; Edward C. Cheasty, clothier; O. B. Johnson, Professor of Biology; Lawrence J. Colman, Capitalist; James F. McElroy, Attorney; Charles V. Piper, student; Adam E. Hubbard, carpenter; and John B. Denny, brother of Charles L.

Society was incorporated and eighteen members united in the act of incorporation.¹

The Charter members of the group were: P. Brooks Randolph, Walter A. Hall, J. O. Young, Charles A. Denny, and Edmond S. Meany. Of these five, Randolph, Meany, and Denny remained active throughout the life of the organization. The young men averaged between eighteen and twenty years of age. They first met December 20, 1879, at the residence of B. P. Randolph. Later, Mr. A. A. Denny, the father of Charles L., provided a clubroom for the boys in a small brick building in the rear of his residence. It was here that they met on the average of every two weeks and began the collection of books and specimens.

The early members were amateurs and presented papers or natural history essays of a page or two in length. These papers would serve as a basis for discussion and questions.

¹ Of the twelve men who subscribed in 1885, nine remained when Starkey, McElroy, and Cheasty dropped out. Nine additional men, however, were among the incorporators. These were: Dr. Stephen B. White, government physician; Albert Bryan, businessman; Trevor Kincaid, student; J. W. Buzby; Charles Hill, Professor of Biology; Adela M. Parker, teacher; E. S. Ingraham, businessman; Dr. John Wotherspoon; and Henry Havelock Hindshaw, museum curator.

At one time the group debated, "Resolved that the Colorado potato bug is an injury to mankind." The negative side won! Occasionally an outsider would lecture but not very often, because the small frontier town of the Eighties had little attraction for lecturers.¹

In February, 1883, the activities of the group were divided into nine sections of which entomology was one. In the same year the society subscribed forty dollars for the purchase of a microscope.

In the winter of 1885-86, the young men raised \$1965 among themselves and by contributing their own labor erected a two-story frame building and excavated a basement. The clubhouse was situated on a fifty-six by thirty foot site obtained on a twenty-five year lease from the University of Washington Regents.² In return, their exhibits and facilities were to be available to the University students. Benches and shelves were installed, and Hubbart later established a small cabinet shop in the basement.³ The first meeting was held April 22, 1886.

¹ Population of Seattle according to the University Catalogs was: 1880, 3533; 1890, 42,837; 1900, 80,671

² The clubhouse was erected on what is the present site of the Cobb Building in the heart of downtown Seattle.

³ Tarrar, Washington Alumnus XIII, Jan. 1922, pg. 12.

Firmly established in comfortable new quarters, the records indicate that the Society actually declined. Presumably, however, the clubhouse was actually used as such with frequent informal meetings which more than made up for the lack of formal meetings.

In the year, 1894, the organization enjoyed a new spirit with the guidance of Hindshaw, Kincaid and Parker. The library was developed to several hundred volumes. Among the scientific journals on the subscription list were the Canadian Entomologist and the Entomological News.

The year 1895 foreshadowed the end. The Regents moved the University from downtown Seattle out to the northern suburbs. This took certain University naturalists away from the scene of immediate activity. O. B. Johnson, always a guiding light, became an invalid, and the University wished to use the clubhouse site for business purposes. The group was essentially amateur and, as its members became older, they found their professional pursuits supplanting their youthful hobbies. New members, of the right kind, were scarce. The last dues paid by the members was in 1900. Only seven members attended meeting of January 5, 1905.

Some books and most of the entomological specimens were given to O. B. Johnson. The remainders, were carried out a few at a time and turned over to the University Museum. A

few of the members tried to carry on in informal meetings, but the driving spirit and life was gone from the group. The Young Naturalists' Society had come to an end.

Few members survive.

B. The Entomological Society of British Columbia

If publications and continued interest be considered dominating factors, then certainly the Entomological Society of British Columbia is without a peer in the northwest.

The Entomological Society of British Columbia was founded January 8th, 1902, by a small but ardent group of entomologists living in the environs of Vancouver and Victoria. The original document of organization into Mr. George Hopping's hands in 1938 from Mr. W. Downes of Victoria, who in turn received it from Mr. Francis Kermode, Director of the Provincial Museum. It was found among some old papers of the museum. This document consists of a portion of a sheet of foolscap on one side of which is set forth the names of the first officers and the purpose of the Society, namely:

"The Work of the Society shall include all branches of the Science of Entomology."

Upon the other side appears a list of charter members of the Society as follows: E. Anderson, Victoria; A. H. Bush, Fairview; W. A. Dashwood-Jones, New Westminster; Miss O. De Wolf,

Vancouver; A. W. Hanham, Victoria; R. V. Harvey, Vancouver;
Rev. G. W. Taylor, Wellington; L. D. Taylor, Vancouver;
E. Wilson, Vancouver; T. Wilson, Fairview.

The first president of the Society was Reverend G. W. Taylor, of St. Mathews Rectory, Wellington. Mr. G. O. Day, in his Presidential address of 1914 said of him. "All records point to one man, the late Rev. George W. Taylor, F. R. S. C., F. Z. S., as the first active entomologist in this province. He settled on Vancouver Island about the year 1877 and studied for the ministry. In 1881 he was made a Fellow of the Royal Society of Canada, obtaining this honour largely through his interest in entomology. During the next few years, Mr. Taylor proved himself an active collector and a keen student in the order. At the annual meeting of the Entomological Society of Ontario, held in London, Ontario, October 15th, 1884, he presented the Society with a collection of Diurnal Lepidoptera through the medium of Mr. James Fletcher." Reverend Taylor was largely responsible for the establishment of the marine biological station at Departure Bay, near Nanaimo, in 1908, and was the first director of the station from its inception until his death in 1912.

The first secretary-treasurer of the Entomological Society of British Columbia was Mr. R. V. Harvey, of Queens School, Vancouver. Throughout the early "Proceedings" are

many evidences of the fine attributes of this gentleman and his untiring efforts on behalf of the Society.

The Society was active and strong from its inception in 1902 until April 16th, 1908. A new interest was kindled on March 29th, 1905, by a circular letter sent by the secretary, Mr. Harvey, stating that the Entomological Society of British Columbia had been duly affiliated with the Entomological Society of Ontario. After 1908, no meetings appear to have been held for three years and interest waned, not in entomology, as Mr. Tom Wilson pointed out, but in the Society. A new wave of enthusiasm took place in 1911 owing to the energy and enterprise of Mr. R. C. Treherne, a man of dynamic but charming personality. He called a meeting in December, 1911, at Aberdeen School, Vancouver, at which seventeen regular members were in attendance and various papers read. The present vigorous condition of the Society is due in no small measure to the timely effort of Mr. R. C. Treherne.

Upon the death of Reverend Taylor, Mr. Tom Wilson held the office of president until the meeting in January, 1913. Mr. Wilson was born at Musselburgh, Scotland, in 1856. As a young man he studied horticulture and forestry and then went to India at the age of twenty-four. Here he had charge of tea plantations in lower India and in Burma. After six years in the tropics, he returned to Scotland but set sail

soon afterward for Canada. For a time he was employed on construction work of the Canadian Pacific Transcontinental Railway and he used to remark that "he walked into British Columbia before the railway was completed". From this time on he remained in British Columbia and was always an ardent supporter of the Entomological Society. In 1896 he was appointed Fruit Inspector in the Provincial Department of Agriculture. In 1900 he entered the Dominion Service as Superintendent of Fumigation and in 1906 the Inspectorship of Indian Orchards was added to his duties. Mr. Wilson lost his life in an hotel fire at Hope on March 6th, 1917. Mr. R. C. Treherne said of him, "His intimate knowledge of our birds, mammals, plants and insects was nothing short of marvelous, and it was conceded by all who knew him that he represented the best type of field naturalist the Province has enjoyed for a great many years."

The Society experienced a very active life from 1911 to 1914, and then the effects of the war began to be apparent. Members were called overseas and our first secretary, Captain R. V. Harvey, was wounded and taken prisoner at Festubert, subsequently dying of his wounds in Germany. There were three presidents who guided the Society through this difficult time from 1913 to 1918. Mr. G. O. Day who now resides at Duncan, Vancouver Island, held the presidency from 1913 to 1915

inclusive, Mr. E. H. Blackmore during 1916 and 1917, and Mr. R. S. Sherman in 1918. Both Mr. Day and Mr. Blackmore were Lepidopterists of considerable note. The latter prepared one of the most complete collections of Microlepidoptera of British Columbia. After the death of Mr. Blackmore in 1929, his large collection was acquired by the University of British Columbia. Mr. Blackmore again held the presidency during 1919 and 1920.

In 1921 Mr. L. E. Marmont of Maillardville became president and held the office for five years. At the last annual meeting held in February, 1938, the members again had the pleasure of greeting Mr. Marmont, one of the older and beloved members of the Society. From 1920 to the present time, the Society has been in fairly robust health and during the past decade, particularly, has come to be one of the foremost scientific bodies in the Province. In September, 1923, the Society took another step forward when it became incorporated under the Societies Act of British Columbia.

Mr. J. W. Winson of Huntingdon occupied the presidential chair from 1926 to 1932 inclusive. He is a man of considerable attainment as a naturalist and edits an enjoyable column on natural science in one of the Vancouver papers. From 1933 to 1935 inclusive, Mr. W. Downes ably piloted the organization. Mr. Downes is doing entomological work at Victoria and has a

particular interest in the Hemiptera. At the annual meeting in 1936, Mr. Ralph Hopping was elected President. He has recently retired after long service as a forest entomologist in the Dominion Entomological Branch. His particular interest in systematics lies in the Coleoptera of which he has a collection ranking among the first five on this continent. In 1937 the chair was occupied by Mr. E. R. Buckell, a keen Orthopterist who represented Canada at the International Conference for Anti-locust Research held in Cairo, Egypt, in 1936. He has prepared a very good collection of the Orthoptera of British Columbia and has done some excellent work on the control of grasshoppers on stock ranges.

The president in 1939 was Mr. E. P. Venables of Vernon. Mr. Venables has had long service in fruit insect work and has been a member of the Society since the early years. It is to Mr. Venables that we are indebted for many reminiscences of the early days. He has related how Captain R. V. Harvey walked into the Okanagan Valley over the old Hope-Princeton trail in 1906, and how he spent many congenial hours with Harvey, collecting at the head of Okanagan Lake. It is also related that one of the charter members, Mr. A. H. Bush, a locomotive engineer by profession, used to proceed down the main streets of Vernon with a perfectly huge insect net,

beating the shade trees along the way, much to the bewilderment and sometimes amusement of the townspeople. In perusing the old files and papers of the Society, many interesting details have come to light which space does not permit recording here. However, it might be of interest to note that one of the charter members, Mr. L. D. Taylor, afterwards was Mayor of Vancouver for a number of years. In the election of 1938, he was candidate for this office again but was unsuccessful.

During the past decade, the Society has increased in membership and scope so that it is now international in character, including members from the University of Washington, Oregon State College, and various United States Experiment Stations. In 1927, the membership was thirty-three. At the present time the membership stands at sixty-seven, and a further increase may be expected. The current publication of the Society is entitled "Proceedings of the Entomological Society of British Columbia," at present issued once a year, in February.

Slowly but steadily the Entomological Society of British Columbia is working toward the goal of becoming an organization embracing the entire northwestern part of the continent, issuing a quarterly publication, and including a membership

commensurate with such a scientific body.¹

British Columbia is of great size geographically with most of the population concentrated near the coastal area. Formerly most meetings were held at the Grosvenor Hotel and at the Science Building at the University of British Columbia, at Vancouver. This entailed the journey of a considerable number of members who lived and worked in the interior. With the coming of war, the Society decided to hold simultaneous meetings in Vancouver and in Vernon for the better accommodation of coastal and interior members. All papers are read, either in entirety or by title at each meeting. A vice-president is elected by the coast and one of equal rank by the interior group. Thus the Society continues to function efficiently.

The Society honors its outstanding members who have been long active in activities, by electing them to the office of Honorary President.

The meetings of the Society are characterized by splendid Canadian hospitality, and by the reading of excellent papers, both professional and amateur. The dues are very nominal.

¹With only a few small changes to assure uniformity, the bulk of the material included in this section is taken from:

Hopping, George R., The Entomological Society of British Columbia, The Canadian Entomologist, LXXI, Jan. 1939, pp.31-33.

Number 38 of the Proceedings of the Entomological Society of British Columbia¹ lists the Directors as follows:

Honorary President.....L. E. Marmont
 President.....G. J. Spencer
 Vice-President (coast).....R. Glendenning
 Vice-President (interior).....G. Allen Mail
 Hon. Secretary-Treasurer.....Geo. R. Hopping
 Hon. Auditor.....J. W. Eastham
 Advisory Board: - W. Downes, H. B. Leech, W. G. Mathes,
 E. R. Buckell, A. D. Heriot.

FORTY-FIRST ANNUAL MEETING¹
 ENTOMOLOGICAL SOCIETY OF BRITISH COLUMBIA
 FEBRUARY 28, 1942

(Held in two sections, one at the University of British Columbia and one at the Dominion Entomological Laboratory, Vernon, B.C.)

Officers Elected for Ensuing Year

Honorary President.....L. E. Marmont
 President.....A. D. Heriot
 Vice-President (coast).....J. R. J. Llewellyn-Jones
 Vice-President (interior).....James Marshall
 Honorary Secretary-Treasurer.....G. R. Hopping
 Honorary Auditor.....J. W. Eastham
 Advisory Board: - W. Downes, H. B. Leech, G. A. Mail,
 W. G. Mathers, G. J. Spencer.

There were fourteen present at the Vernon meeting and twenty-five at the Coast. The following papers were presented: G. A. Hardy, Notes on Some Wood Boring Beetles of Saanich, Vancouver, Island; D. E. Bomell, The Biology of the Klamath Midge; W. Downes and H. Andison, The Occurrence of the Apple Sawfly on Vancouver Island; G. Allen Mail, Lethal Temperatures for Demacentor andersoni Stiles and Other Species of Ticks in British Columbia; G. J. Spencer, A Note on the Bethyloid

Parasite of the Carpet Beetle, Anthrenus scrophulariae (Linn.); J. D. Gregson, Notes on the Laboratory Rearing of Some Canadian Ticks; Ivor Ward, A Note on Grasshopper Control in the Nicola Valley, 1937-1941; G. A. Hardy, The Black Witch Moth, Erebus odora L. in British Columbia; James Marshall, The Effect of Lime on the Larvicidal Value of Cryolite; R. Glendenning, Insects of Note in the Lower Fraser Valley in 1941; G. J. Spencer, The Mallophaga of Mammals in British Columbia; A. D. Heriot, The Diet of the Codling Moth Larva; G. J. Spencer, Insects and Other Arthropods in Buildings in British Columbia; A. A. Dennys, Feeding Habits of the Codling Moth Adult with Reference to the Use of Stomach Insecticides; I. McTaggart-Cowan, Notes on the Life History and Anatomy of Cephenomyia pratti Hunter and Lipoptena depressa Say, Two Flies Parasitic on Deer in British Columbia; H. F. Olds, Results of Further Work Done on the Control of Grain Mite; E. P. Venables, Habits of the Brown Mite, Bryobia praetiosa Koch; Ben Hoy, Bigger and Better Codling Moths (Vernon meeting only).

Both meetings strongly urged that every effort be made to have the Society meet in one group next year. Plans for this are to be worked out by the executive.

A motion was carried that the Constitution be amended to establish a category of Honorary Membership. This amendment

will be prepared and voted upon at the next annual meeting.

A motion was carried that, because of war risk, all remaining stocks of Proceedings be transferred from Vancouver to Vernon.

The Vernon meeting voted to charge contributors for reprints of articles in the Proceedings, the Vancouver meeting left it to the discretion of the Secretary-Treasurer and other Board Members.

The reproduction of portraits of past Presidents in the Proceedings was objected to at this time by the majority of members on the grounds that money is scarce and the cost of publishing such plates would cover publication of valuable papers.

In the evening an enjoyable informal dinner was held at Vernon. At the Coast, members gathered for luncheon at Brock Memorial Hall. In the evening out-of-town and some local members met at the home of Professor G. J. Spencer for dinner and a social evening.

The Society has been publishing the papers of its members since 1906. However a certain confusion has arisen because of changes in titles, numbers, sections, and financial sponsors. It is hoped that the record of these numbers, as reproduced on the following page, will clarify the situation.¹

¹Leech, Hugh B., The Dates of Publication of Certain Numbers of the Proceedings of the Entomological Society of British Columbia. Proc. Ent. Soc. B.C. No. 38, Feb. 7, 1942, pp. 29-36.

This information is given chiefly because this is the only solely entomological publication of the northwest.

It seems desirable to establish the dates of publication of the various numbers of the "Proceedings of the Entomological Society of British Columbia." In several cases, the numbers were not published even within the year cited on the covers or title pages. The data given are taken chiefly from records and letters of transmittal in the possession of the Society.

First of all, just what constitutes actual publication? There is as yet no definite ruling on this matter, by the International Commission of Zoological Nomenclature. A generally accepted suggestion is that to establish the first date of publication, a journal must give out or distribute on the one day, ten or more copies; i.e. a mailing or distributional date, as against a printing date. In the case of the Society's Proceedings, distribution of copies at an Annual Meeting could thus establish a date of publication. For a period of years, it was customary for the Secretary of the Entomological Society of British Columbia to send copies of the "Proceedings" to the printers of the "Canadian Entomologist." The firm then mailed both journals under one cover. This would undoubtedly establish dates of publication for certain of our numbers, provided copies had not already been distributed in a recognized manner.

The earliest publication of the Society, then known as the British Columbia Entomological Society, was the quarterly "Bulletin," edited by Captain R. V. Harvey, and financed by the members. Ten numbers were published between March, 1906, and June, 1908. Complete sets of these bulletins being rare, they were reprinted in August, 1926.

After a few years of quietness, the Society became active again in 1911, largely through the enthusiasm of the new secretary, the late R. C. Treherne. Publication was resumed under the title "Proceedings of the British Columbia Entomological Society." The first two numbers were printed at the private expense of a few members, but the Provincial Department of Agriculture later reimbursed the Society. Manuscripts for the third number dealt chiefly with economic entomology, so Treherne, backed by a favorable resolution from the British Columbia Fruit Growers' Association, put up a strong case to the Department of Agriculture at Victoria. He succeeded in having No. 3 passed through the Government press free of charge to the Society, which had by then become known as the Entomological Society of British Columbia. Because many papers were considered to be too technical for the farmer, it became necessary to submit only the purely economic manuscripts to the Department of Agriculture, while the others were printed through the Department of Education. This led

to the labelling of the Proceedings as "Economic Series," and "Systematic Series," the numbers of the former being consecutively paged, those of the latter independently. This system resulted in double numbers, and a considerable mix-up in the order of publication; it was discontinued with No. 20.

Number 1.: "1911" is imprinted on the title page, but on page 39 there is a List of Members dated as for "January 19th, 1913," presumably a misprint, for just below that is the Financial Statement as of "January 31st, 1912." The Fruit Magazine Publishing Co. Ltd., Hastings Street West, Vancouver, sent a printing bill for \$94, which was paid on February 14, 1912. On March 6, 1914, R. C. Treherne wrote to an Entomological Society in Naples, saying in part: ".....Bulletin No. 1, which was published in December, 1911...."

Thus December 31, 1911, might be acceptable as the date of publication, though the data are confusing, and suggest January or February, 1912, as possibilities.

Number 2.: This was printed by Western Specialties, Ltd., Vancouver. The title page gives "1912" but this can be ruled out as a date of publication, since Plate 1 is a photograph of members taken at the afternoon session of the meeting, January 9, 1913.

There are cards acknowledging receipt, from persons in eastern Canada and the United States, dated April 10, 11, and 12, 1913, and one from the Imperial Bureau of Entomology, London, posted on April 14, 1913. Mr. W. E. Scott, Deputy Minister of Agriculture, Victoria, B.C. acknowledged 600 copies on February 27; these were to be given out at the Annual Meeting of the British Columbia Fruit Growers' Association. Western Specialty Co. gave the Society a receipt for \$250, representing 1,000 copies of Proceedings No. 2, on April 18, 1913.

Accordingly the date of publication may perhaps be set as the last day of February (28), 1913.

Number 3.: With this number the title changes from "Proceedings of the British Columbia Entomological Society," to "Proceedings of the Entomological Society of British Columbia." Printed by the King's Printer. Both the cover and the title page state "July, 1913," but this means only that No. 3 contains the proceedings of the midsummer meeting, Vernon, B.C., July 18 and 19.

The proof for No. 3 was sent to Treherne for correction on November 3, 1913 (letter from W. J. Bonavia, Secretary to the Minister of Agriculture). There is a letter from W. E. Ward, dated December 2, 1913, in which he says, "I understand from the daily papers, that the British Columbia Entomological Society have issued their semi-annual report..". An old mailing list in our files is headed "List of Members, Regular and Complimentary, to whom copies of Bulletin No. 3 N.S. were sent in November and December, 1913" and there are letters of acknowledgment dated as follows:

G. O. Day,	December 7	Arthur Gibson	December 24
H. F. Wilson,	December 13	R. T. Heselwood	December 30

Number 4.: This was originally to have been published as two separate numbers: the papers on economic entomology (pages 1-39) by the Department of Agriculture, the technical papers (pages 39-83) through the kindness of Mr. Kermode, by the Department of Education. The two sections were so financed, but the King's Printer was willing to print both under one cover.

In a letter to Treherne, dated October 14, 1914, the Secretary to the Minister of Agriculture said that he was forwarding a copy of Proceedings No. 4, just off the press, and that 800 copies would follow direct from the bindery. This shows that in Treherne's later remark (Proceedings No. 7, Part 2, page 24), October should be substituted for September. Dr. Gordon Hewitt in Ottawa had just received a copy of No. 4 on October 27, and on September 10 he acknowledges a number of copies to be distributed to the Ottawa staff.

Thus October 20, 1914, would seem to be a fair date to accept for the publication of No. 4.

Number 5.: This number was issued at the expense of the Society, to "set a standard in type of print thought desirable for scientific literature." The pages are numbered consecutively with those of No. 4, except that 79-83 (the index pages) of the latter were omitted from consideration, and hence the numbers are repeated in No. 5. Printed by the News-Advertiser, Vancouver.

The cover and title page are imprinted "January, 1915;" the proofs are on hand at the meeting of January 16, 1915, and were there examined by the members (letter of February 16, 1915, Treherne to G. O. Day): Treherne stated at the meeting that "We are getting out a little bulletin which will be Bulletin No. 5, and.....will be published in about ten days." In a letter to F. Kermode, dated February 17, 1915, Treherne

mentions having heard complimentary remarks on No. 5, from persons who had received copies.

Accordingly, January 31, 1915 is probably acceptable as a date of publication for Proceedings No. 5.

Number 6.: This was published under the direction of the Provincial Museum of Natural History. It is paged consecutively with No. 5.

On February 16, 1915, Treherne wrote to Mr. G. O. Day, "I am submitting Bulletin No. 6 to the Department to print in Victoria.." On February 23, W. J. Bonavia wrote from Victoria, asking Treherne whether or not 1,200 copies would be sufficient. The letter of transmittal by F. Kermode (page following the title page) is dated March 5.

With no further data at hand, it is proposed to accept the date on the cover of No. 6, i.e., June, 1915.

Number 7.: There is no data on this number. It was issued through the King's Printer, and is independently paged. It contains some of the papers given at the Second Midsummer Meeting, Kelowna, August 20, 1914 (Part 1), and some from the Fourteenth Annual Meeting, Vancouver, January 16, 1915.

The cover and title page give the date "July, 1915".

Number 7A: "Supplementary Report to the Proceedings of the British Columbia Entomological Society."

This report, printed by the Thos. R. Cusack Press of Victoria, cost the Society \$60. It contains twenty pages numbered in Roman numerals; the cover is Page 1, and carries the date, "April, 1916." The Cusack Press shipped the newly-printed Report to Mr. Williams Hugh, Hon. Secretary-Treasurer of the Society, on July 6, 1916, and in his account book there is the entry, "July 6th. Mailed 82 Reports."

Accordingly, the Supplementary Report is accepted as of July 6, 1916.

Number 8, Systematic Series: This is marked "March, 1916" in large type, on both the cover and title page; but at the bottom of each there is "1918" in small type. Independently paged.

We know that it was not published in 1916, for in Entomological News 28 (10):469 (December, 1917) there is a quotation from a letter written by E. H. Blackmore, then President of the Society, to the News. At the foot of the page the editor (P. P. Calvert) says: "We heartily second the hope expressed by Mr. Blackmore in another place in his letter that the B. C. Entomological Society may, in spite of its difficulties, soon issue numbers 8 and 10 of its Bulletin." Dr. Philip P. Calvert tells that Nos. 8 and 10 are stamped as having been received there on October 24, 1918; the two are numbers apparently sent to them in one shipment. The Library of the United States National Museum also received Nos. 8 and 10 together, on October 26, 1918.

There are entries by Wms. Hugh, in the Society's accounts for 1918, as follows:

"October 17, Cartage on Proceedings.....	\$.50
"Postage Proceedings.....	2.00
"October 18, Postage Proceedings.....	1.50"

These entries establish a mailing date, October 17, 1918, for Nos. 8 and 10.

Number 9. Economic Series: This was published through the King's Printer, and the page numbers are a continuation from No. 7. The cover and title page are dated "August, 1916." The Library of the U. S. National Museum received their copy on December 14, 1916, so it is probable that the date of publication could be accepted as given on the cover.

Number 10, Systematic Series: The cover and title page give "March, 1917" in large type, and "1918" in small type at the bottom. Independently paged. See notes on No. 8; both these numbers were printed by the Colonist Printing and Publishing Co., Ltd., Victoria. The mailing date is established as October 17, 1918.

Number 11, Economic Series: Published through the King's Printer; the page numbers are a continuation from No. 9. The cover and title page are dated "April...1920." The following data are from letters in the Society's files: W. Downes (Hon. Sec.-Treas.) to E. H. Blackmore, April 9, 1920, "Bulletin No. 11 is temporarily held up as we are waiting for Mr. Baird's paper, which he had to send to Ottawa for approval." Mr. H. Ruhmann to W. Downes, September 2, 1920. "I return herewith the galley proof you sent for list of references..." (article 2, No. 11). W. Downes to R. C. Treherne, October 19, 1920. "Bulletin No. 11 is now ready, and I will send you a

number of copies today." The U. S. National Museum received their copy on November 10, 1920.

Hence it appears that about October 20, 1920, would be an acceptable date for No. 11.

Number 12, Systematic Series: Independently paged; printed by The Colonist Printing and Publishing Co., Ltd., Victoria. The cover and title page show "February, 1918" in large type and "1919" in small type at the bottom.

The bill for printing was submitted to the Society on December 21, 1919, and reads as if the 500 copies of Proceedings No. 12 were handed over to the Secretary on December 17, 1919; there is a letter from W. Downes to Dr. Warnock on December 26, "The cost of issuing our last Bulletin, No. 12, was \$196, an increase of \$70 over the previous issue." A letter from W. Downes to W. H. Brittain, January 7, 1920, says in part, "The Proceedings of the B. C. Entomological Society is now ready and we would be glad to send copies to all the members of the Nova Scotia Society, but we do not know their addresses." There is a similar letter, on the same date, to A. W. Baker of the Entomological Society of Ontario. The Library of the U. S. National Museum received their copy on January 21, 1920.

It is not likely that mailing to members of the eastern Societies was attended to until all members of the local Society had received their copies; hence December 31, 1919, should be a fairly accurate date for No. 12; there is an entry on that date in the Sec.-Treasurer's account book, showing that thirty-two copies of the Proceedings were mailed.

Number 13 and 15 (one volume) Economic Series: Published through the King's Printer; the page numbers are a continuation from No. 11. The cover and title page give "June, 1921." The Library of the U. S. National Museum received their copy on December 27, 1921; No. 16 was received at the same time.

Number 14, Systematic Series: Printed by the Colonist Printing and Publishing Co., Ltd., Victoria. Independently paged. The cover and title page show "March, 1919" in large type, and "1920" in small. There is a letter from W. Downes to R. C. Treherne, December 28, 1920, "The next bulletin No. 14 ought to be off the Press some time next week." Also one

from G. O. Day to W. Downes, December 30, 1920, "I am return-herewith the galley proof of my paper on Oporinia autumnna, together with the typewritten copy." On January 29, 1921, W. E. Whitehead acknowledged the receipt of twenty copies of No. 14, to be distributed to members of the Entomological Society of Nova Scotia. The Library of the U. S. National Museum received their copy on February 2, 1921.

It is presumed from the above that early January, 1921, was the date of mailing of copies to local members of the Society.

Number 16, Systematic Series: Printed by The Colonist Printing and Publishing Co., Ltd. Independently paged. The cover and title page show "February, 1920" in large type, and "1921" in small. The Library of the U. S. National Museum received their copy on December 27, 1921.

Number 17 and 19 (one volume), Economic Series: Printed by Evans and Hastings, Vancouver; the pages are a continuation from No. 15. The cover and title page show "October, 1923." The bill for printing was submitted for payment on September 11, 1923. There is no other date.

Number 18, Systematic Series: Printed by The Colonist Printing and Publishing Co., Ltd., Victoria. The cover and title page give "February, 1921." It is desirable to date this number accurately, since it contains H. M. Parshley's original descriptions of four new species of Hemiptera.

Number 20, Systematic Series: Printed by Rose, Cowan and Latta, Ltd., Vancouver. The cover and title page state "September, 1922." According to entries in the Treasurer's account book, the Dominion Express Co. were paid on October 17 for delivering Proceedings No. 20, while \$5.50 was paid out for postage stamps between October 25 and November 2. This indicates the second half of October, 1922, as a probable mailing date.

Number 21: Printed by Evans and Hastings, Vancouver, and dated "1924" only. The following entries from the Treasurer's accounts for 1924 indicate early August as the mailing date, and also that some copies accompanied the August number (mailed Aug. 29) of the "Canadian Entomologist."

"July 31. Cheque, express on Proceedings..	\$2.35
Aug. 7. Cheque, stamps.....	10.00
Aug. 10. Cheque postage on Proceedings	
(Curran Bros.).....	4.47

But this does not agree with Glendenning's statement (Proceedings No. 22, p. 6) that it was published in October. This latter date is surely a mistake for the printing bill was paid on August 14.

Number 22: Printed by Evans and Hastings, and dated "1925." There is no further date.

Number 23: On the cover, "1927". There is a letter of January 29, 1927, from the printers, Evans and Hastings, referring to No. 23, which must have been printed soon after that date. The Library of the U. S. National Museum received a copy on April 18, 1927, and the Division of Entomology at Ottawa got theirs on April 13.

Number 24: On the cover and title page, "1927". There is a letter from the printers, Evans and Hastings, to R. Glendenning, dated January 11, 1928, giving a page estimate for No. 24. Also a letter to Messrs. Curran Bros. printers of the Canadian Entomologist, with reference to including copies of No. 24 with the February, 1928, number of that journal. Mr. R. H. Ozburn advised that the February, 1928, number of the Canadian Entomologist was mailed on March 5, 1928. The Library of the U. S. National Museum received a copy of the Proceedings No. 24 on February 17, 1928, while the Division of Entomology at Ottawa got theirs on February 13. Thus No. 24 was issued in February, 1928.

Number 25: On the cover and title page, "1928." Printed by Murphy and Chapman, Vancouver. According to a letter from G. O. Day to R. Glendenning, December 4, 1928, No. 25 was not yet in press. On January 8, 1929, Day returned a typed and corrected copy of his paper for No. 25 to Glendenning. The Ottawa library got their copy on March 19, 1929.

It is probable that early February, or perhaps January 31, 1929, could be accepted as the date of publication of this number.

Number 26: On the cover and title page, "1929." There is a letter from Wrigley Printing Co., Ltd., to Glendenning, dated February 11, 1930, which refers to the figures for E. R. Buckell's article on earwigs, so No. 26 was not printed until soon after that date. The printers sent in their bill on February 20. The Division of Entomology got their copy on March 1, and the U. S. National Museum got theirs on March 5.

Therefore, the latter part of February, 1930, can be accepted as the date of publication of No. 26.

Number 27: On the cover and title page, "1930". Printed by Murphy and Chapman. On February 25, 1931, W. Downes wrote to Glendenning, asking to have a short paper put into the Proceedings, if it was not already in press. On March 2, he acknowledged Glendenning's answer, and says that since the number is in press, he will send his article to "The Pan-Pacific Entomologist." Copies were distributed at the Thirtieth Annual Meeting, in Vancouver, on March 21, 1931. The U. S. National Museum received their copy on April 1, 1931.

Thus March, 1931, can be accepted as the date of issue of No. 27.

Number 28: On the cover and title page, "1931". Printed by Murphy and Chapman. According to a letter from Downes to Glendenning, dated March 30, 1931, Glendenning must have just asked for the manuscript of "Holly Insects," so that he could submit all papers for an estimate of the cost of printing. The Division of Entomology at Ottawa received a copy on November 30, 1931, and the U. S. National Museum got theirs on December 2.

Number 29: On the cover and title page, "1932" Printed by Murphy and Chapman. The U. S. National Museum received a copy on August 19, 1932. G. O. Day, in a letter dated August 17, 1932, said, "I have duly received the copy of the 'Proceedings of the B. C. Entomological Society' (sic) you have so kindly sent me."

Number 30: On the cover and title page, "1933." Printed by The Quality Press, Victoria. According to a letter from W. Downes to G. R. Hopping, October 23, 1933, copies of No. 30 had just been received from the printers. Except for a sample to Hopping, no copies had been distributed by October 28. On November 14, Downes sent 25 copies to Hopping; the U. S. National Museum received theirs on November 27.

Thus it is probable that November 1, 1933, could be cited as the date of publication of No. 30.

Number 31: On the cover and title page, "February -, 1935." Many copies have been changed by pen, to read "February - 1934." Printed by The Quality Press. The date, February, 1934, cannot be either a printing or a publication date, because on

page 3 there is mention of the "Thirty-third Annual Meeting... held on Saturday, March 24, 1934,..." while on page 6 there is a footnote referring to an article in the "Canadian Entomologist" for August, 1934, (mailed September 2).

Galley proofs were ready on January 31, 1935. Following the suggestion in a letter from W. Downes (January 17, 1940), No. 31 should be considered as published on February 23, 1935, by distribution to members at the Thirty-fourth Annual Meeting. The U. S. National Museum received their copy on May 1, 1935.

Number 32: On cover and title page, "Issued January, 1936," Printed by the Quality Press. On January 9, 1936, G. R. Hopping wrote to Downes as follows: "The copies of the Proceedings were received. I presume you are mailing to those on the list there and that these are given for odd requirements."

Copies were distributed at the annual meeting on February 28, 1936, and it may be best to accept that as the date of publication.

Number 33: On the cover and title page, "Issued January, 1937," Printed by the Quality Press. On February 8, 1937, G. R. Hopping returned the page proofs to W. Downes. According to a letter from Downes (January 17, 1940) "No. 33, 1937 was distributed at the Annual Meeting on February 27, and the balance mailed early in March.

Thus February 27, 1937, is the date of publication for No. 33.

Number 34: This is the first number printed by the Vernon News, Vernon, B.C. Succeeding numbers have also been done by that firm. On the cover and title page, "Issued February 16, 1938." This is actually a printing date; copies were not mailed or distributed then, but were first given out at the Thirty-seventh Annual Meeting at Vancouver, on February 26, 1938, which is thus the date of publication.

Number 35.: On the cover, "Issued February 25, 1939." This is an actual date of publication. Copies were received from the printers on February 24, and about thirty were distributed at the Thirty-eight Annual Meeting at Vancouver, February 25.

Number 36: On the cover, "Issued February 24, 1940." This is an actual date of publication, as in the preceding case.

Number 37: On the cover, "Issued February 22, 1941." This is an actual date of publication.

C. The Society of Scarabs

The Scarab Society is small, unique, and clings to a certain exclusiveness. Meetings are usually held one evening monthly in the study of Dr. M. H. Hatch's home at 5547 Twent-fifth Avenue, N.E., Seattle, Washington. Informality and hospitality is the keynote. All of the members are, or have been, students in entomology at the University of Washington. All, however, are primarily interested in Coleoptera. The members have available to them the collections and enormous personal library of M. H. Hatch as well as the O. B. Johnson Collection, the Kincaid Collection, and certain items of the University of Washington Collection. Members exhibit and expand certain parts of their personal collections. Emphasis is laid on the expansion of personal collections. A considerable number of foreign specimens have been added to the collections.

Occasionally guests are invited or persons to speak informally to the group. Occasionally too, the members meet in the rooms of the Zoology Department on the University of

Washington campus. Notices of the meetings are mailed to the members on cards marked with a symbolized scarab designed by Mr. Clifford Burner, one of the charter members.

The group gravitates around Doctor Hatch, who has held the informal post of chairman since the inception of the club in 1937. Small yearly dues of fifty cents each are paid by members with an occasional small subscription levied for mimeographing certain material.

The Society functions also in a social capacity. Wives and husbands of the members good humoredly call themselves the "Auxillary" and play bridge until the Scarab's meeting is adjourned and refreshments served.

The first meeting of the charter members of the Society of Scarabs was held at the home of M. H. Hatch at 8:00 p.m. Sunday, June 6, 1937. Dr. Hatch acted as chairman.¹ The records of that meeting state:

"The common bond between members is a profound interest in some phase of the study of Coleoptera. Future members of the Society are defined as those advanced students of Entomology who have found interest in Coleoptera."

¹ This information is taken from a letter sent to the writer March 7, 1942, by Mrs. Helen Gelleman Houk, Secretary, and from the recollections of the writer who was a charter member of the group.

The objectives of the group as listed at the first meetings include:

1. Field trips to new collecting areas.
2. Discussion meetings for:
 - a. Purpose of comparison of specimens.
 - b. Trading of specimens by members.
 - c. Study of entomological literature.
 - d. Collecting information.
 - e. The study of groups of Coleoptera.
 - f. Social enjoyment.
3. That a typical collection of Northwest Beetles be assembled.
4. That a preliminary check-list of the Coleoptera of Washington be made.
5. Simple initiation of new members.

Up until March 7, 1942, a total of forty-nine meetings had been held. Rarely more than a half dozen members are present. These are usually those persons residing in or near Seattle, since a number of members, who were formerly associated with the University in one capacity or another, have transferred their residences to other localities since the formation of the group.

The charter members are: Melville H. Hatch, Barbara Gray Bruhns, Gertrude Minsk, Elizabeth Tarrar Kinney, Dan Bonnell, Joseph Bruzas, Robert Pratt, and Clifford Burner. Members inducted since: Frank Beer, Frances Bjorkman, Helen Gellerman Houk, Erwin Dailey, Robert Duvall¹, and Gordon

¹ Dropped from membership in 1938.

Patterson. Trevor Kincaid was elected as an Honorary Member.

The organization has put out one mimeographed paper, "A Preliminary List of the Coleoptera of Washington," in 1939. It lists 2200 species.

D. The 'Puget Sound Entomological Society'¹

The Puget Sound Entomological Society was formed at the instigation of M. H. Hatch, of the University of Washington, and Mr. E. P. Breakey, Entomologist of the Western Washington Experiment Station, who, along with other persons, felt that Western Washington was rather inadequately represented by any functioning entomological society.

A group of thirty-two men and women, who represented a good cross-section of western Washington amateur and professional entomologists, met at Puyallup, Washington, during the day and evening of November 18, 1938. After some discussion the names: Washington Entomological Society, Columbia Entomological Society, and Western Washington Entomological Society were rejected and the group was formally named The Puget Sound Entomological Society.

¹ Information in this section was very largely furnished by Dr. E. P. Breakey, Entomologist for the Western Washington Experiment Station, and Secretary to the Society, and from the recollections of the writer who was a charter member of the group.

The Society held its initial meeting on March 10, 1939, in Room 214, Johnson Hall, on the University of Washington campus. Professor Trevor Kincaid was elected President and Mr. S. E. Crumb, Vice-President. A general constitution and by-laws were adopted. Twenty-three persons attended the meeting.

Two meetings have been held each year: one in the spring and one in the fall, rotating between Seattle and Puyallup. However, in the fall of 1941, the constitution was amended to provide for only one meeting per year, that meeting to be held in the fall.

Mr. S. E. Crumb was the second president of the Society, and Professor James R. Slater was elected to the office for 1941-1942. Mr. W. W. Baker was elected Vice-President under Slater and is apparently scheduled for the Presidency of the Society in 1942-1943.

The Society does not sponsor the papers given at the meetings by the members for later publication. Most of these papers, however, of such caliber that they are eventually printed by reputable journals.

The membership has remained fairly stable and the Society has attracted persons from other sections of the Pacific Northwest. Dues are nominal. The Society fills a long-felt need

in the area (which was not covered by the activities of the Scarab Society and the Puget Sound Academy of Science) and partially fills the scientific gap caused by the demise of the Young Naturalists' Society.

E. The Oregon Entomological Society

The Oregon Entomologists have recently come to feel that the state definitely needed an entomological society. The Seminar of the Department of Entomology had functioned somewhat in the nature of a club for many years, catering chiefly to the staff and students of Oregon State College. The Seminar had frequent guest speakers and presented papers by the faculty and experiment station members and by students. It was obvious, however, that the Seminar could not function efficiently for the entire State because many professional and amateur entomologists were not contacted. Dissatisfaction continued and several proposals, to organize a club or society of larger scope, were abortive. This activity was suddenly directed and consummated by the arrival on the campus of Richard Lewis Post in the fall of 1939.¹

Post had had considerable experience in the East as Head of the Entomology Department at Ward's Biological Supply

¹ See Richard Lewis Post in the Section on Biography.

House in Rochester, New York. He was thoroughly familiar with the workings of societies and had a very wide acquaintance with entomologists all over the country. In his new capacity as Curator of the Oregon State College Collection he rapidly made many friends among the entomologists of Oregon.

After conferences with Doctor Don C. Mote and other members of the staff, Post instigated a movement which culminated in the formation of the Oregon Entomological Society. A list was prepared bearing the names of many Oregon entomologists. A form letter was prepared and, over the signature of Mote, sent out to a large number of persons. This letter is reproduced herewith.¹

"We are contemplating the organization of an Entomology Club in Oregon which will include all individuals who are interested in Entomology, either as a vocation or avocation. By this means professional and amateur entomologists of Oregon can become acquainted with each other and come together for mutual pleasure and cooperation.

The date selected for the organization meeting is Saturday, November 18, at 10:00 a.m. The place---Corvallis, Oregon State College Campus, Room 302, Agricultural Hall. Oregon State College homecoming is also this weekend with a good football game between Oregon State and California. At this meeting we will decide the time and place of future meetings.

At the organization meeting, we would like to outline our program and objectives. Will you give the tentative

¹ This letter is dated November 1, 1939, and is in the files of the Department of Entomology at Oregon State College.

objectives which follow your consideration so that they may be discussed along with any other suggestions that may occur to you.

1. Preparation and publication of state lists of insects.

Specimens collected by members of the organization in addition to those in the O.S.C. collection should add appreciably to the total number of species of insects now recorded from the state.

2. Assemble and inform members on the collecting and preserving techniques.

Devote a portion of certain meetings to technique. Members will present helpful hints and suggestions on how to collect, prepare, mount and display specimens in which they are interested, as well as the publications and workers in the various groups of insects.

3. Assemble and compile information for the Insect Pest Survey.

The Insect Pest Survey is a monthly publication put out during the active season by the U.S.D.A., Bureau of Entomology and Plant Quarantine. It is believed that we can be of assistance in compiling data for this survey by recording distribution, damage and abundance of injurious species.

4. Publication of a periodic bulletin on the activities of the Entomology Club.

This bulletin will give the minutes of the meetings and a summary of the program. Additional items that may be of interest to the club will be included. In this manner the club members will have an opportunity to keep in touch with the proceedings even though they are not able to attend each meeting.

It is planned to hold certain meetings in different sections of the state in the spring and summer. The objects of these meetings are two-fold: (1) to enable members who live

far from the valley to attend and become acquainted with those who attend from the valley and other districts of the state, (2) to provide an opportunity for all members who attend to collect insects and compare notes and observations to their hearts content.

We are including herewith a list of individuals who are interested in Entomology and who we believe will be interested in this club. We will be glad to receive names of others who might be interested, so that we may inform them of this meeting.

We trust that you will be able to attend the organization meeting, and take an active part in our club."

P.S. Your name was submitted in response to the above request. We hope that you will be interested and able to attend the organization meeting. If you can not attend, please indicate your interest by asking to be placed on our mailing list."

Following the organizational meeting, it was decided that the Society would publish a mimeographed bulletin, using the facilities of the college, and that the bulletin would be dispatched periodically to the members. The first Bulletin of the Oregon Entomology Society is reproduced herewith:¹

Volume 1, Number 1

December 7, 1939

THE BULLETIN OF
THE OREGON ENTOMOLOGICAL SOCIETY

Notice of Next Meeting:

The next meeting of the Oregon Entomological Society will be held Saturday, December 16 at 3:30 p.m., Room 310 Agricultural Building, Oregon State College, Corvallis, Oregon

¹From a copy in the possession of Richard Lewis Post.

Proceedings of the Organization Meeting:

The organization meeting of the Oregon Entomological Society was held Saturday, November 18, at Oregon State College. 35 persons attended. This organization is composed of amateur and professional entomologists of the State of Oregon banded together to promote interest in entomology and to be mutual assistance.

The following officers were elected:

President: Dr. Don C. Mote, Head, Department of Entomology, Oregon State College

Vice-Presidents: Mrs. Ruth C. Whitney, Portland, Oregon; Mr. Kenneth M. Fender, McMinnville, Oregon

Secretary: Richard L. Post, Technician, Oregon State College.

Letters from persons who could not attend the meeting were read to show their interest in the organization and their regret at being unable to attend.

Following the election of officers the members stated their particular interests in Entomology.

It was decided to hold monthly meetings at Corvallis with the exception of one meeting to be held in Portland and an annual week-end field trip to some favorite collecting grounds in the state. Crater Lake was suggested as a likely place for the first field trip.

Mrs. Whitney invited us to hold our spring Portland meeting at her home as there is good collecting in that vicinity.

The third Saturday of each month at 3:30 p.m. was tentatively selected as the most convenient time for the meetings of this organization.

The objectives of the society as outlined in the mimeographed announcement were heartily approved and plans to build up a reference collection of insects were discussed.

The members of the club adjourned to the steps of the library in order that a group picture might be taken.

Selection of Committees:

At a brief meeting of the officers held after the organization meeting of the Society, the following committees were appointed:

Program Committee

Chairman: Dr. W. J. Chamberlin, Oregon State College
Mrs. K. M. Fender, McMinnville, Oregon
Mr. F. P. Keen, Portland, Oregon

Membership Committee

Chairman: Jim Baker, Baker, Oregon
Fred Lawrence, Medford, Oregon
Mrs. A. L. Veazie, Portland, Oregon
Mrs. H. K. Zimmerman, Astoria, Oregon
Harold Rice, Eugene, Oregon

The members of this committee are asked to contact everyone in their section of the state who is interested in Entomology and inform them of the Society and its meetings. It is possible that they can arrange for the members in their section to come in a group and share expenses.

* * * *

Everyone, and especially those members who were not present at the organization meeting, is requested to state their field of interest in Entomology and if they are willing to exchange or determine specimens. A complete list of all entomologists in the state, both professional and amateur, is planned for the next issue of the Bulletin. This list will include the particular interest of each member. If you know of anyone interested in the study of insects whose name has not appeared on our list, please advise us.

Proposed Program for the Next Meeting:

The following is the tentative program for our next meeting:

1. A sound movie film on the mormon cricket will be shown. This is a new film just released by the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

2. We have asked Mrs. Whitney to introduce her new book on entomology for children, and to speak on the popularization of entomology.

3. A portion of the time will be reserved for the determination and discussion of insects and technique. It is hoped that members will bring specimens with them for discussion and determination.

* * * *

Remember the next meeting is to be on December 16 at 3:30 p.m. We hope you can plan to come. Also remember we are interested to know your particular interest in entomology and whether or not you are willing to collect, exchange and/or determine material.

R. L. Post, Secretary

The organizational meeting, as indicated above, was held at Oregon State College on November 18, 1939. Thirty-five persons attended.

Meetings are rarely held in the summer months, hence Volume I of the Bulletin contained six numbers. Volume II, Number 1, is dated November 12, 1940.¹ Meetings are usually held monthly, on a Saturday, and embraced a variety of localities to favor the many members who do not reside in Corvallis. The Bulletin shows a chronological gap between Number 4, March, 1940, and Number 5, August, 1940. The minutes of the April 22 meeting are included in Number 5. Volume I ends with Number 6, dated October 5, 1940. Volume II, Number 1, is dated November 12, 1940; Number 2 is dated

¹Copies of the Bulletin of the Oregon Entomological Society are on file in the Department of Entomology.

January 11, 1941; Number 3 is dated February 14, 1941; Number 4 is dated March 15, 1941; Number 5 is dated April 21, 1941; Number 6 is dated June 5, 1941. Volume III, Number 1 is dated October 10, 1941; Number 2 is dated November 7, 1941; Number 3 is dated January 12, 1942; Number 4 is dated February 14, 1942; Number 5 is dated March 4, 1942.

The Bulletin indicates that, prior to April, 1942, a total of twenty meetings have been held. The number of members attending has been as high as 43 and as low as 8. The average is between 30 and 35.¹

Volume III, Numbers 4 and 5 listed a total of one hundred and eighty-four members! However, the Society actually gravitates around a nucleus of twenty or thirty members. The membership rolls boast the names of the heads of the Divisions of the Bureau of Entomology and Plant Quarantine, and includes Mr. Annand and Miss Mabel Colcord, Federal Librarian.

The meetings are informal, no dues are levied, and are usually climaxed by refreshments or dinner at the homes of the entertaining members or at local hotels. There is no formal initiation. Meetings have been held in all sections

¹ The Bulletins indicate the date of meetings and number of members attending as follows: Dec., 1939 - 35; Jan. 1940-32; Mar. 1940-36; Apr. 1940-43; Aug. 1940-8; Oct. 1940-34; Nov. 1940-38; Jan. 1941-41; Feb. 1941-23; Mar. 1941-18; Apr. 1941-22; May 1941-8; June 1941-9; July 1941-35; Aug. 1941-16; Oct. 1941-22; Nov. 1941-16; Jan. 1942-14; Feb. 1942-31.

of the state. It remains to be seen just how much lack of transportation, due to the present war, will curtail the activities of the Society. The meetings are usually featured by lectures, scientific movies, economic exhibits, and general activity.

The Bulletin is written by R. L. Post, who has been Secretary since the inception of the Society, and is newsy, contains the minutes of previous meetings, notices of future meetings, and contains notes on the activities of the various members.

The nominal guidance of the organization has been under the following officers:

1939-1940

President.....	Dr. Don C. Mote
Vice-Presidents.....	Mrs. Ruth C. Whitney
	Kenneth M. Fender
Secretary.....	Richard L. Post

1940-1941

President.....	Dr. Herman A. Scullen
Vice-President.....	Dan Bonnell
Secretary.....	Richard L. Post

1941-1942

President.....	Kenneth M. Fender
Vice-President.....	Dan Bonnell
Secretary.....	Richard L. Post

The success of the organization is to date very largely due to the initiative and unflagging interest of D. C. Mote and R. L. Post.

IV.

INSECT COLLECTIONS IN THE NORTHWEST

The Northwest has proven no exception to the rule that insects will be collected, by interested persons, wherever they might be found. Large numbers of insects have been collected in this area from very early days. European entomologists sent many specimens to other parts of the world during the past century. It is beyond the present scope of this paper to offer other than general information on the subject of insect collections and to mention some few in detail.

A. The O. B. Johnson Collection¹

Orson Bennett Johnson's history is essentially tied in with the early days of the University of Washington. Johnson first appeared at the University in 1882 as Professor of Natural History. He had been collecting natural history specimens since boyhood. His first collection was given to Woods Oregon Museum and its exact fate is not known. Johnson brought with him from Oregon a collection of 20,000 natural history specimens. Johnson very soon became associated with the Young Naturalists' Society and gave them most of his

¹ See the Biographical sketch on O. B. Johnson for additional information concerning details of his collection.

birds, shells, egg, etc., in return for their entomological specimens. Johnson's chief interest was in the Lepidoptera. He corresponded with Dr. Herman Strecker (1836-1901) of Reading, Pennsylvania. Strecker in turn submitted Johnson's local species to authorities all over the world. Johnson would then receive the named species. Johnson also began to collect Coleoptera at this time. His invalidism prompted less activity and his working hours became more and more devoted to his collection. This collection was turned over to the University in 1916. Johnson died the following year. The collection, at the time of deposition, was said to include more than 6,000 Lepidoptera and more than 12,000 Coleoptera—the most complete collection of Washington insects in existence. In 1927, M. H. Hatch described the collection as containing: Arachnida 1 box; Myriapoda 1 box, Neuroptera 1 box, Hemiptera 5 boxes, Diptera 10 boxes, Hymenoptera 11 boxes, and the Coleoptera 38 double boxes. The Coleoptera contained 4503 named species (3146 Nearctic). Professor Johnson kept few records of determinations. Many determinations are undoubtedly correct but there are sufficient errors to make one critical and considerable value is thereby lost. Name labels of different colors indicate the region of origin: pink for the Pacific Northwest, white for the balance of the Nearctic

region, green for Europe, blue for Asia, yellow for Africa, salmon for Neotropical, and brown for Australiasian.

The collection is deposited in the Orson Bennett Johnson Biological Laboratory, on the University of Washington campus, and has been consulted by the writer many times.

B. The Trevor Kincaid Collection

Kincaid has been essentially associated with the University of Washington since 1894. Previous to that summer, as a young man, he built up a collection of nearly 60,000 insects in addition to sending off the astounding amount of nearly 100,000 specimens for determination. Kincaid has continued as an assiduous collector but his collection has been largely dissipated through gifts to the National Museum, the University of Washington Museum, and other scientific agencies. The residue has been in the care of M. H. Hatch since 1927 or 1928.

C. The M. H. Hatch Collection

M. H. Hatch came to the University of Washington as an assistant professor of zoology in 1927. He is, at present, professor of zoology at the same institution. He collected insects from early boyhood and became especially interested in Coleoptera while a student at Pomona College and has

studied the group since 1917. In 1925, his collection of Coleoptera listed 9254 species, 524 varieties (2736 species plus 95 varieties from North America). He made extensive purchases of foreign material from Germany in 1922 and 1923. At the present time his personal collection includes more than 500 boxes of which 200 contain northwestern material, 200 general North American material, and 100 foreign material.

Hatch's collection is perhaps the most complete in the West with the possible exception of that of the California Academy of Science. It is the epitome of painstaking neatness and accuracy. It is of great value. The writer is without exact personal information regarding its ultimate donation, but suspects that the collection will be deposited with University of Washington. The writer has made extensive use of this collection.

D. The Washington State Museum Collection

This is a general collection that has proceeded by slow increments and is now deposited with the University at Seattle. It includes fragments of the collections of O. B. Johnson, Trevor Kincaid, the Young Naturalists' Society, and others. The foundation of the Museum was approved by the Legislature on March 6, 1899.¹ However, a museum was actually functioning

¹ From Session Laws, 1899, p. 40. Chap. XXX (H.B. No. 79).

already under the sponsorship of the Biology Department. An inventory¹ indicated that there were 4,500 species and approximately 15,000 specimens in the insect collection. In the early part of 1905, certain materials were received from the Young Naturalists' Society.² The collections were shuttled from building to building during the early days and were partly inaccessible.³ Certain temporary buildings were left on the campus from the Yukon-Pacific Exposition of 1909. The California State Building and the Forestry Building were reserved for the exclusive use of the Museum. These buildings served until 1927. In that year the Museum took up quarters in the old library building when the new University library was constructed. The insect room was finished in October, 1928. A large amount of insects are now on special display for the benefit of numerous museum visitors. The collection has been examined by the writer many times.

¹ Fourth Biennial Report, University of Washington, Dec. 1, 1896.

² From the Minutes of the Young Naturalists' Society, 1905-1906. Mss.

³ Tenth Biennial Report, Jan. 1, 1909.

E. The Washington State College Collection

This collection numbers approximately 118,000 specimens: 47,000 determined and 71,000 undetermined. The groups Hymenoptera, Diptera, Coleoptera, and Hemiptera are well represented.¹ The insects mounted for demonstration are very good. This collection was examined by the writer during the summer of 1941.

F. The University of British Columbia Collection

Little information has been obtained concerning this collection. It has been very largely accumulated during the past decade, and represents the gifts of a large number of enthusiastic collectors, as well as the personal collection of Professor G. Spencer. The writer had a brief opportunity in February, 1942, to examine the collection maintained for student use. The collection was neat, authentic, and workable.

G. The University of Idaho Collection

This collection is largely economic, and represents gifts of students, professors, and friends of the University. Professors Shull and Martin have contributed. The writer briefly viewed the collection during the summer of 1940 and considered it adequate for student needs.

¹ From a letter sent to R. L. Post from Roy D. Shenefelt, Instructor, W.S.C., on April 12, 1940.

H. The Spokane City Museum Collection

A small display chiefly gathered by Frank Hall, former Curator. Viewed by the writer during the summer of 1940.

I. The Vancouver, B.C., City Museum Collection

A fairly comprehensive collection of Butterflies and Moths pertaining to British Columbia, arranged chiefly by Mr. Larnder, and the R. S. Sherman collection of Diptera.¹ Viewed by the writer in February, 1942.

J. The W. J. Chamberlin Collection

Located at Oregon State College and considered one of the nation's finest private collections of Buprestidae and Scolytidae. About 100 boxes are in the office of the writer. The collection contains numerous types etc.

K. The British Columbia Provincial Museum Collection²

Since the inception of the museum at Victoria, B.C., in 1886, there has accrued to date approximately 52,000 specimens of all orders. The basis of the collection was the work of Mr. E. M. Anderson, a member of the staff from 1903-1916. He

¹ From a letter to the writer by T. P. O. Menzies, Curator, April 15, 1942.

² Information contained herein is from a letter to the writer by G. A. Hardy of the Museum, dated April 9, 1942.

collected extensively in various parts of the Province in all the orders. This nucleus has been considerably augmented by many gifts. These gifts have been incorporated with the main collection or stored for future study and identification. A catalogue of British Columbia Lepidoptera compiled by E. M. Anderson in 1904 was published by the Museum. From 1913 to 1928 Mr. E. H. Blackmore published on Lepidoptera in the Annual Reports from 1913 to 1924, and also published therein certain new species and identifications of British Columbia insects. The Museum also published a revised Check-List of the Macrolepidoptera of British Columbia in 1927 by the same author. The 1924-1928 Annual Reports contain the work on Buprestidae and Cerambycidae by Mr. G. A. Hardy, the versatile staff botanist. The 1930 Report contains the work of Mr. J. F. Gates Clarke on Microlepidoptera. The collection is still receiving numerous additions.

L. The Oregon State College Collection

This is one of the world's large collections, second only to that of the Calif. Acad. of Sci. on the Pacific Coast, and enjoys the distinction of being, possibly excepting the combined Kansas-Snow collection, the largest of any University or College west of the Mississippi.

The Collection was inaugurated during the very early days of the institution and has gradually increased by gifts from

the students, staff, and other institutions and agencies. The collection has gained 25,000 additional specimens in the past two years. The collection, prior to 1939, was large, but rather unwieldy and additions were not receiving due attention. At the instigation of D. C. Mote, Head, Mr. Richard Lewis Post was brought from Wards Biological Supply House to act as Curator and Technician. Post has, with a small staff of assistants, brought remarkable order to the Collection. Thousands of insects have been sent away for determination with the result that the entomological collection contains approximately 134,700 specimens of insects; of these 96,500 were named. About 90 per cent are from Oregon, the remainder being from various regions of the country, and about 3,000 from foreign lands. Orders represented are: Coleoptera 29,500; Hymenoptera 20,000; Diptera 9,000; Lepidoptera 3,000; other orders constitute the remainder. The collection now contains more than 285 types, paratypes, and cotypes; types are the specimens in the hands of the authorities when the species are first described. A microscope slide collection contains 2,100 minute and fragile forms. In 1941, 1,650 specimens were donated to the insect collection from other institutions here and abroad, and from individuals interested in entomology in Oregon.

Special attention is being paid to Oregon aquatic insects, which now number 4,800 vials of preserved specimens. A collection of 820 authentically determined specimens is housed in a special rack system.

A special student reference collection containing 8,000 forms has been prepared. Specimens are mounted in permanent transparent-topped tin boxes and so arranged that the important taxonomic characters are visible. Illustrated keys to the orders of the insects, accompanied by the actual specimen, have been arranged in glass-topped display boxes. Life histories of the most important insects are contained in 450 glass-topped Riker mounts. A catalog of Oregon insects is in the process of preparation. The value of the collection is enhanced by the research publications available in the entomological library.

M. General Insect Collections in the Northwest¹

Complete information is not obtainable, therefore omissions are regretted. A brief list of private collections are as follows: Prof. Spencer of the University of British Columbia, Ectoparasites; G. A. Hardy, of the Provincial Museum of British Columbia, Buprestidae and Cerambycidae; Geo. Hopping, Vernon, B.C.;

¹ See the Section on Biography for further information on some of the persons listed here.

Forest Coleoptera; Robert Pratt, Coupeville, Wash., Coleoptera; James, Baker, Baker, Oregon, Geometrids and Elateridae; Fender Collection, McMinnville, Oregon Coleoptera (Cantharidae) 20,000 specimens, Rhopalacera 300 specimens; Mrs. A. L. Veazie of Portland, Oregon, 1000 Butterflies; Lee Motley, Durkee, Oregon, 24 drawers of general collections; Dr. Getzlaff of Salem, Ore., Oriental Lepidoptera; C. W. Herr (deceased) 2 cabinets of rare Tropical Lepidoptera; Gertrude Hoppe, Seattle, Plecoptera; Falconer Smith, Seattle, ants; Elizabeth Farrar, Seattle, Cembidiini; Barbara Gray Bruhns, Seattle, Agonini; Margery Wills, Seattle, Trichoptera; Frederick Eernisse, Seattle, Curculionidae; E. C. Anderson, Corvallis, clover insects; Harris Anderson, Victoria, Thysanoptera; W. W. Baker, Puyallup, Rhyncho-
phora; A. Burr Black, Salem, Oregon, Hymenoptera; E. P. Breakey, Puyallup, Wash., leafhoppers; E. R. Buckell, Kamloops, B.C., Orthoptera and Odonata; I. McT. Cowan, Vancouver, B.C., parasitic insects; S. E. Crumb, Sumner, Wash., noctuid larvae; S. E. Crumb, Jr., Corvallis, Tachinidae; M. S. Cummings, Klamath Falls, Oregon, Aquatic insects; J. E. Davis, Corvallis, Aquatic insects; Wm. Downes, Victoria, Hemiptera and Homoptera; G. R. Ferguson, Corvallis, Hymenoptera; R. E. Foster, Vancouver, B.C., forest insects; R. M. Fouts, Eugene, Oregon, Hymenoptera; P. A. Gavin, Seattle, Tachinidae; C. W. Getzendanner, Yakima,

Wash., Cicindelidae; K. E. Gibson, Yakima, Elsteridae and Buprestidae; C. M. Gjullin, Portland, Culicidae; R. Glendenning, Agassiz, B.C., Aphididae; H. G. Grady, Portland, Psyllids; H. E. Graham, Corvallis, Hymenoptera; K. G. Gray, Corvallis, general collection; J. D. Gregson, Kamploops, B.C., Coleoptera; T. Y. Hsiao, Corvallis, Hemiptera; C. Andresen Hubbard, Forest Grove, Oregon, fleas; J. K. Jacob (deceased), Vancouver, B.C., Termites; S. G. Jewett Jr., Portland, Lepidoptera and Plecoptera; E. W. Jones, Walla Walla, Wash., Coleoptera; J. R. J. Llewellyn Jones, Cobble Hill, B.C., Lepidoptera; J. C. Jones, Corvallis, trypetidae; G. H. Kaloostian, Spokane, fruit insects; F. P. Keen, Portland, forest insects; Robert Furniss, Portland, forest insects; E. F. Knipling, Portland, Diptera; E. P. Lanchester, Walla Walla, Wash., wireworms; M. C. Lane, Walla Walla, Wash., Elateridae; H. B. Leech, Vernon, B.C., aquatic coleoptera; B. V. Leighton, Seattle, Lepidoptera; H. V. Loughhead, Eugene, Ore., Coleoptera; G. A. Mail, Kamploops, B.C., wireworms; H. C. Manis, Moscow, Idaho, economic insects; W. G. Mathers, Vernon, B.C., forest insects; G. V. G. Morgan, Vancouver, B.C., forest insects; Paul Mowry, Corvallis, Diptera; R. W. Nelson, Spokane, economic insects; H. J. Ostlind, Corvallis, forest insects; R. L. Post, Corvallis, display insects; M. L. Prebble, Victoria, forest insects; M. M. Reeher, Forest Grove, Oregon, economic insects; H. E. Rice, Eugene, Oregon, Australasian

Lepidoptera; R. E. Rieder, Salem, Oregon, Diptera; L. P. Rockwood, Forest Grove, Oregon, economic insects; Joe Schuh, Corvallis, Odonata; R. G. Scott, Corvallis, Coleoptera; H. A. Scullen, Corvallis, Hymenoptera; C. H. Starker, Corvallis, tachinidae; E. M. Swisher, Corvallis, Orthoptera; W. D. Touzeau, Vancouver, B.C., Aphididae; I. J. Ward, Kamloops, B.C., economic insects; Ruth C. Whitney, Portland, Lepidoptera; R. M. Yancey, Corvallis, aquatic insects; Stanley Nicolay, Edmonds, Wash., Lepidoptera; Frank Beer, Salem, Oregon, Buprestidae; B. G. Thompson, Corvallis, Aegeridae; D. E. Bonnell, Corvallis, Carabidae; Joe Bruzas, Bothell, Wash., Coleoptera; Gertrude Minsk, Seattle, Coleoptera; Helen Gellerman Houk, Seattle, Coleoptera; H. Patterson, Seattle, forest insects.

V.

THE DEVELOPMENT OF ECONOMIC ENTOMOLOGY IN THE NORTHWEST

Economic entomology, in the northwest, has been as important and received at least as much attention, during a corresponding period, as any other section of North America. It has been chiefly based upon fruit, vegetable, cereal and forage crops, and forest products. Minor attention has been paid to medical, veterinary, and other aspects. The chief centers of investigation have been the various state and provincial agricultural experiment stations. The federal governments, in the United States and the Dominion of Canada, have aided greatly.¹

It is hoped that the complete listing of State and Provincial entomological bulletins, on succeeding pages, will be of some use to Northwestern entomologists.

¹ Other than a brief listing, the writer has not attempted to enumerate the work of the U.S.D.A., Bureau of Entomology and Plant Quarantine in this area. The reader is referred to W.P.A. Publication No. 9, not yet printed as of the date, April, 1942. It is the writer's understanding that this publication will contain all relevant information concerning the federal entomological work in this region. Any attempt on the writer's part to delineate federal work would be superfluous in view of the impending publication. The writer regrets that he can give no further information on the publication.

A. BEPQ OFFICES AND LABORATORIES

IN THE NORTHWEST

Oregon

Corvallis

Division of Fruit Insect Investigations,
Oregon Agricultural Experiment Station.

Biology and control of the pear thrips on prunes.

In cooperation with the Oregon Agricultural Experiment Station.

S. C. Jones, agent, in charge.

Eugene

Division of Fruit Insect Investigations,
1701 Riverview Avenue. P.O. Box 346.

Filbert insect investigations, including studies of the biology, habits, and host-plant relations of the filbert worm, as a basis for control measures.

S. M. Dohanian, associate entomologist, in charge.

Forest Grove

Division of Cereal and Forage Insect Investigations,
312 Gales Creek Road. P.O. Box 278.

The pea aphid and other insect pests of leguminous forage and seed crops, including the vetch bruchid, grasshoppers under range conditions, entomogenous fungi, and miscellaneous pests of grains and grasses are studied.

In informal cooperation with Oregon and Washington Agricultural Experiment Stations.

L. P. Rockwood, entomologist, incharge.

The Forest Grove station for Cereal & Forage Insects Investigations was established in 1914 by Cecil W. Creel, under the direction of F. M. Webster who was at that time in charge of the Division of Cereal and Forage Insect Investigations. The first laboratory was over the wood shed in the rear of Science Hall on the campus of Pacific University. Later a room was occupied in the basement of the college library for a brief period. In 1916, the laboratory was moved to an old

residence on the Gales Creek Road, adjacent to an acre of land owned by the Indian Service and abandoned by them when the Indian School was moved to Chemawa. The laboratory was moved from this location to the second floor of the Miller Building at 1 Main Street in 1936. The present quarters at 312 Gales Creek Road were occupied jointly by the Cereal & Forage Insect Division and the Truck Crop & Garden Insect Division in 1939. The plot of Indian Service land in northwest Forest Grove was transferred to the Department of Agriculture by Act of Congress in 1919.¹

The following entomologists have been employed at this station:

C. W. Creel, 1914-1919; now Director of Extension, Univ. of Nevada.

James M. Langston, 1917-1919; now with Mississippi A&M College.

B. G. Thompson, 1918-1919; now Assoc. Entomologist, Ore. Expt. Sta.

Frank R. Cole, 1918-1919; dipterologist, now a citrus grower, Redlands, California.

A. C. Burrill, 1918-1920; now in museum work in Missouri.

M. C. Lane, 1918-1925; now in charge of Walla Walla Laboratory for Wireworm Investigations, Truck Crop & Garden Insect Investigations, U.S.D.A.

Sadie E. Keen, 1921-1929; now Mrs. S. K. Zimmerman, Astoria, Oregon.

T. R. Chamberlin, 1926-1935; now in charge of laboratory for White, Grub Investigations, U.S.D.A., at Madison, Wisconsin.

Max M. Reeher, temporary 1914-1918, permanent 1919 to date.

L. P. Rockwood, 1915 to date; in charge since July, 1919.

The more important insects upon which work has been done are:

Clover Flower Midge
Hessian Fly & its parasites
Grasshopper & Crickets

Clover Root Borer
Dry Land Wireworms
Cutworms

¹ This historical information concerning the Forest Grove Station is from the Personal Correspondence of the writer and was very kindly furnished in a letter of March 30, 1942, by Mr. Rockwood.

Clover Leaf Weevils & their parasites	Wheat Jointworm
Clover & Alfalfa Sitona Weevils	<u>Diabrotica</u> <u>soror</u>
Meromyza Species & other stem maggots	The Wheat Midge
Pea Aphid on forage crops	<u>Hypera</u> <u>rumicis</u> &
Scouting for alfalfa weevil	parasites
Pests of native legumes	Vetch bruchids
Entomogenous fungi	Pollination of red clover

In addition to these, some data has been accumulated on many other insects affecting cereal and forage crops.

Division of Truck Crop and Garden Insect Investigations.
312 Gales Creek Road. P. O. Box 278.

Investigations of the pea weevil as a pest of garden and Austrian peas.

In cooperation with the Oregon Experiment Station
J. C. Chamberlain, associate entomologist, in charge.

Portland

Division of Foreign Plant Quarantine

439 U. S. Court House, Sixth and Main Streets.

Enforcement of foreign plant quarantines for the state of Oregon and southern Washington; involving inspection of imported plants and plant products and treatment of same when necessary, inspection of maritime vessels and aircraft, and inspection and/or certification of plants and plant products to meet sanitary requirements of foreign countries.

C. L. Ritchie, inspector in charge.

Division of Forest Insect Investigations,

445 U. S. Court House, Sixth and Main Streets.

Supervision of bark-beetle survey and control projects in Oregon and Washington. Studies of the western pine beetle, mountain pine beetle, carpenter ant, and other insects, and methods of control. Special studies of climatic factors influencing the abundance of bark beetles and the rise and fall of epidemics. In cooperation with the National Forest Service, National Park Service, Office of Indian Affairs, State forestry department, and organizations of private ownership of forest land.

F. P. Keen, senior entomologist, in charge.

Division of Insects Affecting Man and Animals

438 438 U. S. Court House, Sixth and Main Sts.

Biology and control of mosquitoes in the Pacific Northwest. Studies of the flood-water and snow mosquitoes. Relation of certain diseases to mosquitoes. Also ecological studies.

C. M. Gjullin, agent, in charge.

Medford

Division of Plant Disease Control,

103 South Front Street.

State leader in cooperative control of white pine blister rust on important white pines in Oregon by the eradication of wild and cultivated currant and gooseberry plants.

In cooperation with the Federal Forest Service, National Park Service, the State of Oregon, and other local agencies.

Conrad P. Wessla, associate forester, in charge.

Washington

Blaine

Division of Foreign Plant Quarantine,

206 Pacific Highway Customs Station. P. O.

Drawer O.

Enforcement of foreign plant quarantine in northern Washington, including the ports of Anacortes, Blaine, and Bellingham and the Canadian border ports. Inspection and certification to meet the sanitary requirements of foreign countries.

T. A. Barnett, inspector in charge.

Puyallup

Division of Truck Crop and Garden Insect Investigation

2102 Meridian Street, South. P. O. Box 30.

Investigation of the European earwig and berry insects, including the red berry mite and the raspberry fruit worm.

Birely J. Landis, associate entomologist, in charge.

Seattle

Division of Foreign Plant Quarantines,
422 Federal Office Building

Enforcement of foreign plant quarantines in the Puget Sound area, including supervision of the Division's port inspection activities in central and northern Washington and headquarters for cooperative inspection of plants and plant products to meet sanitary requirements of foreign countries, with emphasis on apples and pears (for the western states).

L. M. Scott in charge.

Spokane

Division of Fruit Insect Investigations
805 Realty Building

Eradication of the pear psylla in the Pacific Northwest. In cooperation with the State department of agriculture, experiment stations, and extension service of Washington and Idaho.

James F. Cooper, entomologist, in charge.

Division of Plant Disease Control

618 Realty Building

Field direction and general supervision of cooperative program to establish and maintain control of the white pine blister rust disease in important white pine areas in the western white pine region of Washington, Idaho, and Montana, also in the Rocky Mountain region of Wyoming and Colorado, by the eradication of wild and cultivated currant and gooseberry plants. In cooperation with the Federal Forest Service and National Park Service, the States of Colorado, Idaho, Montana, Washington, and Wyoming, and the timber-protective association, pine owners, and other local agencies.

H. E. Swanson, senior pathologist, in charge.

Sumner

Division of Truck Crop and Garden Insect Investigations
Pierce County Farm. P. O. Box 458

Investigations of the bulb insects and their control and the vectors of narcissus mosaic. In cooperation with the Bureau of Plant Industry, United States Department of Agriculture.

C. F. Doucette, associate entomologist, in charge.

Division of Truck Crop and Garden Insect Investigations
Three miles west of Walla Walla on Wallula Rd. P.O. Box 616.
Investigations of wireworms on irrigated land. In cooperation with the Washington Agricultural Experiment Station and the Bureau of Plant Industry at Prosser, Washington.
M. C. Lane, entomologist, in charge.

Yakima

Division of Fruit Insect Investigations
301 Second Street, P.O. Box 1291
Investigation on apple insects; testing of insecticides for codling moth in relation to the residue problem; studies of bait materials and of bait traps, and banding. In cooperation with the Bureau of Plant Industry and the State agricultural experiment station.
E. J. Newcomer, senior entomologist, in charge.

Division of Insecticide Investigations
301 Second Street. P.O. Box 1291
Determination of residues from sprays containing lead, arsenic, fluorine, and other insecticides; Spray-residue removal by chemical means; field studies of new insecticides. General chemical assistance to cooperating entomologists. In cooperation with the Bureau of Plant Industry.
C. C. Cassil, associate chemist, in charge.

Idaho

Coeur d'Alene

Division of Forest Insect Investigation
P. O. Box 630
Supervision of bark-beetle control projects in Idaho, Montana, Utah, and western Wyoming. Studies of bark beetles and various defoliating insects. In cooperation with National Forest Service, National Park Service, Office of Indian Affairs, State forestry department, and with organizations of private owners of forest land.
J. C. Evenden, senior entomologist, in charge.

Moscow

Division of Truck Crop and Garden Insect Investigations
Entomology Building, University of Idaho. P.O. Box 73.

Investigation of the beet leafhopper. In cooperation
with the Idaho State Experiment Station, the office
of the Governor of Idaho, and the Bureau of Plant
Industry.

J. R. Douglass, associate entomologist, incharge.

B. LOCATION AND PERSONNEL OF THE STATE EXPERIMENT STATION

IDAHO

Moscow - E. J. Iddings, Dir.

W. E. Shull, Ph.D., Ent.

Substations:

Aberdeen - J. L. Toevs, Supt.

Caldwell - R. F. Johnson, Supt.

Sandpoint - R. E. Knight, Supt.

Tetonia - W. A. Moss, Supt.

OREGON

Corvallis - W. A. Schoenfeld, Dir.

D. C. Mote, Ph.D., Ent.

Branch Stations:

Burns - Harney Branch Expt. Sta., Obil Shattuck, Supt.
Squaw Butte Range Expt. Sta., R. G. Johnson,
Leader.

Astoria - H. B. Howell, Supt.

Hermiston - H. K. Dean, Supt.

Hood River - Leroy Childs, Supt. and Ent.

Medford - E. S. Degman, Ph.D., Supt.

Moro - M. M. Oveson, Supt.

Pendleton - G. A. Mitchell, Supt.

Talent - F. C. Reimer, Supt.

L. G. Gentner, Ent.

Union - D. E. Richards, Supt.

WASHINGTON

Pullman - E. C. Johnson, Dir.
R. L. Webster, Ph.D., Ent.

Substations:

Lind - H. D. Jacquot, Supt.
Long Beach - D. J. Crowley, in charge
Prosser - H. P. Singleton, Supt.
Wenatchee - F. L. Overley, in charge
W. J. O'Neill, Asst. Ent.

Puyallup (Western Washington Expt. Sta.) -
J. W. Kalkus, D.V.M., Supt.
E. P. Breakey, Ph.D., Ent.

C. THE OREGON AGRICULTURAL EXPERIMENT STATION

1888-1900

The Experiment Station of Oregon State College (formerly Oregon Agricultural College) is the primary source of work in economic entomology in the State of Oregon.¹ The State College was empowered, under the Hatch Act of 1862, to proceed with Agricultural investigations. E. Grimm, Director, in 1888 stated that the year would be one of preparation and mentioned among other items that work would be done, "for identification of insect pests, and the study of best methods of protection against their ravages."²

Since that time, entomology has played an integral part

¹ Exclusive of Federal Work

² History and Org., Ore. Ag. Exp. Sta. Bul. No. 1, Vol.1, 1888, pg.11.

in the work of the Experiment Station. The first published reports on entomology as issued by the Experiment Station in 1889, contained reports by E. R. Lake and F. L. Washburn on the efficacy of insecticides against the codling moth, woolly aphids, and green aphids; it also gave a description of the corn worm, and standard spray machines.¹ In April, 1890, Bulletin No. 5, written by Washburn, described "some injurious insects and remedies therefor."² 1891 saw Washburn working on the codling moth and attempting to formulate a combined insecticide and fungicide.³ In the same year⁴ he wrote on the grain beetle, sugar beet beetle, tent caterpillars and twig burrower.

Thus work continued apace through the 1890's and was primarily concerned with fruit and small vegetable insects. The year 1898 saw A. B. Cordley, Entomologist, reporting⁵ on the prune twig borer and mentioning the codling moth, the woolly aphids, the apple tingis, the striped cucumber beetle, the peach

¹ Oreg. Ag. Exp. Sta. Bull. No. 3, 1889. pp. 3-24.

² Oreg. Ag. Exp. Sta. Bull. No. 5, 1890, pp. 3-23.

³ " " " " " " 10, 1891. pp. 3-34

⁴ " " " " " " 14, 1891. pp. 3-14.

⁵ Annual Report, Ore. Ag. College & Exp. Sta. June 30, 1898.

tree-borer, flea beetles, and hop louse. 1889 saw the introduction of new work on the strawberry pests, pea weevil, onion pests, and Oregon grasshoppers. Cordley made this report.

1900-1920¹

In 1900 Cordeley reported on essentially the same insects as mentioned above and appeared concerned over the spread of the Hessian Fly. He also expressed satisfaction at obtaining an assistant in the person of Fred M. McElfresh, a graduate of the University of Illinois. An Act of the Legislature in 1901 appropriated \$10,000 for buildings and experimental work in Eastern Oregon. Cordeley reported to Dr. James Withycombe, Vice-Director on the outbreaks of the variegated cutworm. In 1902, McElfresh resigned and Cordeley turned over much of his teaching to an assistant and began to concentrate on economic entomology. The year was marked by the outbreak of the European scolytid beetle referred to as Xyleborus dispar (pyri?) on apple trees, and experiments with "California Crude Petroleum!"² The year 1904 saw Cordley report submitted by the Department of Entomology and Plant Diseases and mentions the

¹ Data acquired from the Annual Reports, Ore. Ag. Coll. and Exp. Sta. 1900-1920.

² Quotation marks are the writers.

rapid spread of San Jose Scale. Bulletin, Number 88, issued in 1906 treats fully with this pest. Apparently Cordley began experimenting with lime-sulphur two years before in 1904, and is recognized as being extremely instrumental in the development of this insecticide. H. E. Ewing in 1914 published an extensive paper on the Common Red Spider.¹ Just prior to this in 1911 the State appropriated \$15,000 to investigate crop and fruit pests and horticultural problems.² H. F. Wilson and A. L. Lovett collaborated on an extensive section of the following report. Meanwhile the Experiment Station had been expanding. Branch Stations were located at Union, Hermiston, and Talent. Cordley was listed as Director and received the highest salary paid by the college—\$2700 for the year 1912.³ The Legislature of 1915 repealed the appropriation acts of 1911 and the Experiment Station staff and activities were dangerously curtailed.⁴ Shortly thereafter investigations

¹ Ewing, H. E., 1914, The Common Red Spider, Ore. Ag. Exp. Sta. Bull. No. 121, Vol. 4, 1914.

² Biennial Crop Pest and Horticultural Report, 1911-1912, Ore. Ag. Coll. and Exp. Sta.

³ Biennial Report of the Board of Regents, 1910-1912, Ore. Ag. College, pg. 163.

⁴ Biennial Report of the Board of Regents, Ore. Ag. Coll. Bull. 1914-1916. Intro. pg. viii.

of the insect pests of yellow pine were pursued. The apple pests, the prune thrips, prune root borer, grasshoppers and garden slugs received attention in 1918-1920.¹ The Hood River Branch continued to report on apple pests.

1920 to Date

The Station continued work with common insect pests and studied calcium caseinate as a spreader, and the use of oil emulsions. The European Earwig, first reported in 1916 was the cause of an emergency project and the Station recommended poison bran bait using sodium fluoride as a toxic agent.² By 1922 the entomologists were rearing tachinid parasites of the earwig. In 1924-1926 attention was given to cherry maggots and symphilids, airplane dusting for the alfalfa weevil and to native bees. The syneta leaf beetle and the strawberry crown borer were added to the list of insects being studied in 1926-1928. In addition substitutes for lead arsenate were sought and field tests with oil spray on codling moths were made. The walnur aphid appearing in 1928 caused additional concern. The filbert moth appeared in Oregon in 1929. The

¹ Director's Biennial Report, 1918-1920. Ag.Col. Exp. Sta. pp. 59-62.

² Dir. Biennial Rep., 1920-1922, Ore. Ag. Col. Exp. Sta. p. 79.

following year the State emergency board allotted a small sum of money for making a survey of the infestation. No real work was begun until 1937 when B. G. Thompson began an investigation. H. A. Scullen began extension work with bees in 1921. D. C. Mote became Acting Head in 1924 of the Department of Entomology and the appointment was confirmed the following year. Many of the above mentioned projects were revived as fresh outbreaks visited the state from time to time.

Entomologists at the Station have been: F. L. Washburn, 1891-1894; A. B. Cordley, 1895-1911; H. F. Wilson, 1911-1915; A. L. Lovett, 1915-1924; and D. C. Mote, 1924-----.

Experiment Station workers, since 1920, include: Dr. B. G. Thompson, G. R. McGinnis, Joseph Wilcox, F. R. Cole, S. C. Jones, Howard Stearns, W. E. Edwards, Kenneth Gray, R. E. Dimick, D. G. Gillespie, Joe Schuh, H. E. Morrison, R. G. Rosensteil, and Dr. George Ferguson.

D. The Idaho Agricultural Experiment Station, Moscow¹

The Idaho Agricultural Experiment Station--based on the Merrill and Hatch Acts, was organized by the Board of Regents

¹ Material listed herein is contained in the Annual Reports, Idaho, Ag. Exp. Sta. from 1893 to date.

of the University and formally opened on February 26, 1892: and immediately qualified for \$15,000 of federal funds annually under the Hatch Act of 1887. Three branch stations were established at once: one near Grangerville in Idaho County; one near Idaho Falls in Bingham County; and one near Nampa in Ada County.

J. M. Aldrich was the Station's first entomologist. In making his report to the President, Aldrich stated, "...the work of the Department of Entomology began with the arrival of the Entomologist September 1, 1893."¹ Aldrich worked on insecticides, grasshoppers, box-elder bugs, Putnam's Scale, San Jose Scale, codling moth, elm louse, pear leaf blister mite, apple aphid, and grape phylloxera. He became a western authority on Diptera but lost most of his collection when the Administration Building burned in 1906. Aldrich served from 1893 to 1905. L. F. Henderson, Botanist and Plant Pathologist, also served as Economic Entomologist between 1905 and 1908. He published on lime sulphur sprays and sprays for apple scab and codling moth. F. E. Whitehead, Extension Entomologist, published on grasshoppers in 1914. A. C. Burrill acted in

¹ Univ. Idaho Bull. 6, January, 1894. p. 17.

the years 1916-1918. R. H. Smith published on the clover aphids in the latter year. J. E. Wodsdalek, Zoologist, assisted with entomology, and in 1922 Claude Wakeland was secured as Entomologist. Between 1922 and 1931, Wakeland was primarily concerned with: onion root maggots, aphids, clover aphids, fruit tree leaf rollers, alfalfa weevils, false wireworms, snowy tree crickets on prunes, and the ever present codling moth. 1932 notes R. W. Haegele, assistant entomologist, publishing on the codling moth, and W. E. Shull on hemipteran pests of vegetables. In 1936, Wakeland and Shull published on the Mormon cricket. Shull has been Head since 1938 and with Fisher as assistant, has been concerned with the pea weevil and more recently in cooperating with the Pear Psylla Project in addition to the current insect pests and instructional duties.

E. The Washington Agricultural Experiment Station, Pullman¹

Entomological work at the Washington State Experiment Station began in 1892 and has continued to the present time. This work has been on various phases and under various men

¹ Compiled from the Bulletins of the Washington Agricultural Experiment Station and the Annual Reports of the State College of Washington Agricultural Experiment Station.

and has been uniformly excellent. Due to the establishment of the Station rather late in the nineteenth century, it, like the other northwestern stations, had a relatively late start and was not functioning efficiently until the nineteen hundreds. The total staff was very small and the early bulletins, to fill out the page and staff roster, included the names of the teamsters and mailing clerk. The station has worked on many of the same problems as its sister stations in Idaho and Oregon.

1892-1900

The first bulletin, on entomology, concerned wireworms and was issued in May of 1892.¹ The second bulletin on entomology concerned the pea weevil and the cottony maple scale.²

Charles Vancouver Piper arrived at the Station from Seattle shortly thereafter and worked upon: farm and orchard pests, Kerosene emulsion, and arsenicals. Later he was assisted by R. W. Doane and gave attention to: San Jose Scale, bud moth, strawberry crown moth, plum sphinx, and blister

¹ Bull. 4, Wash. Ag. Exp. Sta., May, 1892.

² Bull. 7, Wash. Ag. Exp. Sta., Jan., 1893.

beetles. Piper left shortly after the turn of the century.

1900-1920

In 1904 A. L. Melander arrived on the scene as assistant Entomologist. The first two and a half decades of the twentieth century are essentially those of Melander. In 1906 he was promoted to Professor, Head, and Entomologist. His assistants, in succession for his years of service were: W. H. Lawrence, E. L. Jenne, M. A. Yothers, and Anthony Spuler. In 1904 he worked on the raspberry cane maggot, raspberry root borer, apple scab, and woolly aphis. In 1905, major attention was given to the codling moth, The elm bark louse, elm leaf louse, and the effect of lime sulphur on the codling moth, claimed most of his attention in 1906 and 1907. From 1912 to 1920 with the help of Yothers and later of Spuler, the Station was concerned with the Colorado potato beetle, the coulee cricket, cranberry insects, wireworms, bee diseases, and a number of minor insect pests of fruit and vegetables.

1920 - to Date

Melander, assisted by Spuler, continued with the codling moth in 1922. The succeeding years, until his unfortunate death in 1932, show the influence of Spuler in the increased

interest in insecticides. During this period, in addition to many of the above projects, the Station was also concerned with leaf rollers, subterranean insects and grasshoppers.

A. L. Melander left in 1926 and was replaced by R. L. Webster, who has continued as Professor and Entomologist to date.

Webster has continued the Station interest in insecticides.

His department has been concerned with the codling moth, potato flea beetle, box elder bugs, red spiders, blackberry mite, cherry fruit fly, carrot rust fly, onion thrips, pea aphids, pear psylla, and a host of other insects. He was assisted by Spuler (until 1932), W. Baker, and A. J. Hansen. J. Marshall replaced Spuler in 1932 and R. D. Eichman was added to the staff in 1937.

F. Publications of the Agricultural Experiment Stations Relating to Entomology

The publications of the northwestern State and provincial experiment stations form a numerous and varied list and one which it is hoped will be of some use to northwestern entomologists.

The entomological publications of the states of Oregon, Washington, and Idaho, and the Province of British Columbia, give a more complete picture, of insects of economic importance and their control, than can be formed in any other way.

The material listed below contains the state¹ or provincial bulletin numbers, titles, authors, and dates.

OREGON

Oregon Agricultural Experiment Station, Corvallis

Bulletins

3. Practical work with insecticides. By E. R. Lake--Corn worm, insecticides; spraying machines; directions for sending insects. By F. L. Washburn--Some investigations on plants poisonous to stock. By P. H. Irish. Oct., 1889.
5. Entomology: Introductory; some injurious insects and remedies therefor; experiments with grain beetle. By F. L. Washburn--Zoology: Gophers and rabbits. By F. L. Washburn.--Chemistry; fertilizers. By P. H. Irish and W. D. Bigelow. Apr., 1890.

¹ List of Bulletins of the Agricultural Experiment Stations in the United States from their establishment to the end of 1920. U.S.D.A. Departmental Bulletin No. 1119, Washington, D.C., May 26, 1924.

Supplement 1, Bulletin No. 1119, Aug. 1924

Supplement 2, Bulletin No. 1119, Sept. 1926.

Supplement 3, Bulletin No. 1119, Dec., 1927.

List of Bulletins of the Agricultural Experiment Stations for the Calendar year 1927 and 1928. Miscellaneous Publication No. 65, Jan. 1930.

U.S.D.A. Miscellaneous Publication No. 128, Jan. 1932.

U.S.D.A. Miscellaneous Publication No. 181, Mar. 1934.

U.S.D.A. Miscellaneous Publication No. 232, Feb. 1936.

U.S.D.A. Miscellaneous Publication No. 294, Mar. 1938.

U.S.D.A. Miscellaneous Publication No. 362, Jan. 1940.

U.S.D.A. Miscellaneous Publication No. 459, Dec. 1941.

10. Entomology: Practical work at station: Experiments with codling moth and with a combined fungicide and insecticide. By F. L. Washburn.--Hop louse, life history, prevention, remedies, etc. By F. L. Washburn. Apr. 1891.
14. A plain talk about insects; some injurious insects of 1891; the grain beetle (Silvanus surinamensis): a sugar beet beetle (Monoxia guttulata); Tent caterpillars; the branch and twig burrower (Polycæon confertus Leconte). By F. L. Washburn. May, 1891.
18. Insects injurious to young fruit trees; codling moth; kerosene emulsion wireworms; flea beetles. By F. L. Washburn. Mar. 1892.
25. Codling moth and hop louse; gophers and moles. By F. L. Washburn. Apr. 1893.
31. Entomological department: Progress of work; codling moth, hop louse, flea-beetles, radish flies, cutworms and wireworms, tent caterpillars, illustrations of Oregon insects and insect work, gophers and moles, capons and caponizing. By F. L. Washburn. Apr. 1894.
33. Tent caterpillars; the grain plant louse (Siphonophora avenae Fab.); the pear leaf blister; the clover mite Bryobia pratensis Garman; Koebeler's resin wash. By F. L. Washburn. Dec., 1894.
38. Fruit pests. By F. L. Washburn. Sept., 1895.
48. Spraying. By A. B. Cordley. Jan., 1898. See 108.
69. The codling moth and late spraying in Oregon. By A. B. Cordley.--Spraying. By E. L. Smith.--Method of spraying for the codling moth. By J. D. Olwell. Feb., 1902.
75. Insecticides and fungicides. By A. B. Cordley. Mar., 1903. Second edition Feb. 1906. See 108.
88. San Jose Scale. By A. B. Cordley. Mar., 1906.
106. Spraying for peach fruit spot. By A. B. Cordley and C. C. Cote. Aug. 1909.

107. Commercial fertilizers and insecticides. By C. E. Bradley.
Jan., 1910.
108. Insecticides and fungicides: Brief directions for their
preparation and use. By A. B. Cordley. Apr., 1910.
Supersedes 41, 48, and 75.
121. The common red or spider mite. By H. E. Ewing. Aug., 1914.
147. Bark beetles infesting the Douglas fir. By W. J. Chamberlin.
Jan., 1918.
148. The life history and control of the rose leaf hopper (Empoa
rosae): An apple pest. By Leroy Childs. Feb., 1918.
169. Insecticide investigations. By A. L. Lovett. Apr., 1920.
170. The gray garden slug (Agriolimax agrestis Linn.), with notes
on allied forms. By A. L. Lovett and A. B. Black,
June, 1920.
171. Spray gun versus rod and dust in apple orchard pest control.
By Leroy Childs. July, 1920.
172. The western pine bark-beetle (Dendroctonus brevicornis Lec.)
a serious pest of western yellow pine in Oregon
3. A report of chemical investigations on the lime-sulfur
spray. By H. V. Tartar. Mar., 1914.
201. The preparation of spray materials. R. H. Robinson.
Jan., 1924.
223. The tree crickets of Oregon. B. B. Fulton. June, 1926.
259. Sprays, their preparation and use. R. H. Robinson. Feb.,
1930.
296. The strawberry crown moth. Joseph Wilcox, K. W. Gray,
and D. C. Mote. May 1932.
321. Dormant sprays and their use for the control of insect
pests of fruit trees in Rouge River Valley. L. G.
Gentner and R. K. Norris. Dec. 1933.
330. The root weevils injurious to strawberries in Oregon. D. C.
Mote. June 1934.

336. Sprays, their preparation and use. R. H. Robinson. June, 1935.
337. The blackberry mite in Oregon (Eriophyes essigi Hassan), W. D. Edwards, K. W. Gray, Joseph Wilcox, and D. C. Mote. June 1935.
349. The ticks of Oregon. W. J. Chamberlin. June 1937.
357. Insect pests and diseases of strawberry in Oregon. W. D. Edwards and S. M. Zeller. Aug. 1938.

WASHINGTON

Washington Agricultural Experiment Station, Pullman

Bulletins

7. Two injurious insects. By C. V. Piper. Jan., 1893.
17. Insect pests of the garden, farm, and orchard. By C. V. Piper. 1895.
27. A few facts about insects. By R. W. Doane. Jan., 1897.
35. Miscellaneous injurious insects. By C. V. Piper and R. W. Doane. May, 1898.
36. Insects injurious to currants and gooseberries. By C. V. Piper and R. W. Doane. May, 1898.
42. A new sugar-beet pest and other insects attacking the pest. By R. W. Doane. 1900.
47. The variegated cutworm. By R. W. Doane and D. A. Brodies. 1901.
56. Spraying for the San Jose scale with modifications of the sulphur-salt-lime wash. By C. V. Piper.—Chemical notes on the sulphur-salt-lime wash. By R. W. Thatcher. 1903.
62. The raspberry cane maggot. By W. H. Lawrence. 1904.
63. The raspberry root borer or the blackberry crown borer. By W. H. Lawrence. 1904.

65. Three common insect pests of western Washington: The oyster-shell bark louse; the woolly aphis of the apple; the pear and cherry slug. By W. H. Lawrence. 1904.
68. The wormy apple. By A. L. Melander. 1905.
74. Two insect pests of the elm. By A. L. Melander. 1906.
76. Economical preparation of the sulphur-lime spray. By R. W. Thatcher. 1906.
77. The codling moth in the Yakima Valley. By A. L. Melander and E. L. Jenne. 1906. Also Popular Bul. 5.
81. The codling moth in eastern Washington. By A. L. Melander and E. L. Jenne. 1907. Also Popular Bul. 5.
86. The codling moth in 1907. By A. L. Melander and R. E. Trumble. Also Popular Bul. 5.
103. The control of the codling moth. By A. L. Melander. Dec. 1911.
106. The penetration system of orchard spraying. By A. L. Melander and R. K. Beattie. Jan., 1915.
124. Bud weevils and other bud-eating insects of Washington. By M. A. Yothers. Feb., 1916.
130. The dipterous family Scatopsidae. By A. L. Melander. Apr., 1916.
137. The coulee cricket (Peranabrus scabricollis Thomas); General discussion and photographs. By A. L. Melander. Miscellaneous notes on the biology of the coulee cricket. By A. L. Yothers. Jan., 1917.
143. The dipterous families Sepsidae and Piophilidae. By A. L. Melander and Anthony Spuler. Apr. 1917.
2. The sulphur-lime wash. By A. L. Melander. Jan., 1908. See 28.
5. Spraying for the codling moth. By A. L. Melander, Mar. 1908.
16. The sulphur-lime wash. By A. L. Melander and R. K. Beattie. See 28.

17. The single spray for the codling moth. By A. L. Melander.
Apr. 1909.
27. Spraying calendar for 1910. By R. K. Beattie and A. L.
Melander. Jan., 1910.
28. The sulphur-lime wash. By A. L. Melander and R. K. Beattie.
Mar., 1910. A new edition of 2 and 10.
30. Spraying for the codling moth. By A. L. Melander. May, 1910.
33. Spraying calendar for 1911. By R. K. Beattie and A. L.
Melander. Jan. 1, 1911.
43. Spraying calendar for 1912. By R. K. Beattie and A. L.
Melander. Jan. 1, 1912.
45. The control of the codling moth. By A. L. Melander. Apr. 1,
1912.
52. Spraying calendar for 1913: Pests and diseases of the apple,
pear, peach, plum, cherry, etc. By A. L. Melander and
H. B. Humphrey. Feb., 1913.
59. Spraying calendar for 1914: Pests and diseases of the apple,
pear, peach, plum, cherry, etc. By J. G. Hall and
M. A. Yothers. Jan., 1914.
61. The peach twig borer: An important enemy of stone fruits.
By M. A. Yothers. Feb. 10, 1914.
64. Winter sprays: Sulphur-lime wash and crude oil emulsions.
By A. L. Melander. Feb., 1914. See 107.
70. The alfalfa weevil (Phytonomus posticus Cyll.). By W. O.
Ellis. June 10, 1914.
77. Spraying calendar for 1915: Pests and diseases of the
apple, pear, peach, plum, cherry, etc. By A. L.
Melander and D. C. George. Jan. 1915.
78. The San Jose Scale insect (Aspidiotus perniciosus). By
A. L. Melander. Jan., 1915.
100. The control of fruit pests and diseases. By A. L. Melander
and F. D. Heald. Feb. 1916.

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Idaho by the use of oil emulsion sprays. Claude
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156. The beet leaf hopper (Eutettix tenellus Baker); a survey in Idaho. R. W. Haegele, July, 1927.
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Same. 1909. 200 pp.

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Same. 3rd. ed. 1908. 31 pp.

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¹ This verbatim list was compiled by a perusal of:
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Circular No. 33.

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Same, 3rd ed. 1924. 12 pp.
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The woolly aphid of the apple. 1918. 4 pp.
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Same 3rd ed. 1926. 4 pp.
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Circular No. 36.

The onion thrip. 1918. 4 pp.
Same 2nd ed. 1919. 4 pp.
Same 3rd ed. 1921. 4 pp.
Same rev. ed. 1926. 4 pp.
Same 1935. 4 pp.

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The imported cabbage worm. 1918. 4 pp.
Same 2nd ed. 1921. 4 pp.
Same rev. ed. 1926-1929. 4 pp.
Same 1935. 4 pp.

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Same 2nd ed. 1921. 3 pp.
Same rev. ed. 1926. 4 pp.
Same. 1931. 4 pp.

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Apple aphids. 1918. 7 pp.
 Same 2nd ed. 1921. 7 pp.
 Same 3rd ed. 1927. 7 pp.
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Soap solution for spraying. 1918. 3 pp.
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 Same. 3rd ed. 1928. 4 pp.
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Circular No. 63.

Locust control. 1921. 12 pp.
 Same 2nd ed. 1926. 12 pp.

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 blister mite under interior conditions of B. C.,
 by H. H. Evans. 1927. 11 pp.
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G. Notes on Medical Entomology

Medical entomology, due perhaps to geography, lack of vectors, and reservoirs of infection, has never received any great prominence in the northwest. Other than occasional cases of tropical fevers, filaria, etc., apprehended at seaports by quarantine officials, and the observation of such cases at hospitals and the Oregon Medical School,¹ the area has escaped the worst of insect-bourne diseases.² Tularemia and bubonic, typhoid and malaria, and Rocky Mountain Spotted Fever are among the worst diseases of the region. The latter is especially dreaded.

In British Columbia the works of: G. J. Spencer on ectoparasites; Seymour Hadwen on piroplasmosis, ticks and Diptera;

¹ From a statement to the writer in 1942 by E. E. Osgood, M.D., Associate professor of the Oregon Medical School.

² Dean Olaf Larsell of the Oregon Medical School told the writer, in 1941, that his students rarely got to see a typhoid case.

J. L. Todd on ticks; J. D. Gregson on ticks; and G. P. Holland on fleas; are especially noteworthy.¹

Idaho has been primarily concerned with Spotted Fever. In 1908, Dr. Maxey did pioneer work on causal factors, mortality and the geographic distribution of the disease. His findings, briefly, were: that the tick Dermacentor andersoni is the prevailing species; that the disease is more fatal to the aged than to the young; the majority of cases occur in April and May; that there must be some causal relationship between the sheep industry and spotted fever inasmuch as 38% of the cases were noted among sheepherders or sheep handlers.² In the same year, H. T. Ricketts published the observation that the Idaho Spotted Fever was a much milder disease than that found in Montana, as based on his experimental work with guinea pigs, but that it conferred lasting immunity.³ J. L. Stewart and W. E. Smith, Boise physicians published in 1908 on their clinical observations of Spotted Fever.

¹ The reader is referred to Sydney M. Weston's "Publications of the Government of British Columbia 1871-1937," Ag. Dept. Circ. Series. for a list of titles and references.

² Maxey, E. E., Rocky Mountain Spotted Fever, Medical Sentinel, December, 1908. pp. 666-667.

³ Ricketts, H. T., Recent Studies of Rocky Mountain Spotted Fever in Montana and Idaho, Medical Sentinel, Dec. 1908, pp. 678-687.

R. H. von Ezdorf, made a study of malaria in Idaho for the U. S. Public Health Service in 1914, and concluded that only imported cases were present.¹

Publications, on medical entomology, for Washington are sparse. In 1911 Howard reported twenty-seven areas in the state as possessing spotted fever ticks.² Whitaker reported on lice and mite infestations in 1914.³ In 1915 William Hislop gave a control for ox warble flies,⁴ and in 1919 Anderson records a typhoid epidemic at Loon Lake as spread by house flies.⁵ In 1930, H. H. Stage reported on the Mosquito Control Program (U.S.D.A.) for the state of Washington and gives the above date as the inauguration of the first control program. He gave particular attention to Skamania County by mentioning

¹ von Ezdorf, R. H., Malaria in the United States, Public Health Reports, 1915, vol. 30, No. 22, pp. 603-610.

² Howard, L. O., Distribution of the Rocky Mountain Spotted Fever Tick, U.S.D.A., Bur. Ent. Circ. 136. 1911.

³ Whitaker, Helen, Lice and Mite Infestations, Wash. Exp. Sta. Pop. Bull. 74. 1914.

⁴ Hislop, William, The Oxwarble fly. Wash. News. Bull. 139. 1915.

⁵ Anderson, J. B., Typhoid Fever Epidemic. Thirteenth Biennial Report of the Dept. Ag., 1919.

that the actual mosquito control program was begun in 1934; that during 1933-1934 the work was greatly accelerated by an allotment of funds from the Civil Works Administration. He further reported that mosquitoes of importance in the program were Aedes aboriginus, A. fitchii, A. vexans, and A. aldrichi.¹

In 1931 Baker cheese in Puyallup was infested with tyroglyphus siro,² two years later, in 1933, Stage mentions the tropical rat mite, Liponyssus bacoti, as a serious pest on the bodies of some C. W. A. employees at Olympia, Wash.³ In 1934 Stage reported that Aedes aldrichi and A. vexans emerged from flooded bottoms in the Columbia River Area during the middle of May.⁴ The Rocky Mountain Spotted Fever Laboratory staff found Ixodes ricinus californicus on Orcas Island in Puget Sound in 1934.⁵

¹ Stage, H. H., Mosquito Control Activities in the Pacific Northwest under C.W.A. Program. Jour. Econ. Ent. Vol. 28, pg. 1023, 1935.

² Baker, W. W., Tyroglyphus siro in Washington. Insect Pest Survey, Report No. 11, pg. 568, 1931

³ Stage, H. H. ~~The Tropical Rat Mite~~ Liponyssus bacoti, Insect Pest Survey Report No. 14, 163, 1934

⁴ Stage, H. H., Common Mosquitoes in Washington, Insect Pest Survey, Report No. 14, 163, 1934.

⁵ Parker, R. R., Philip, B., Cooley, R. A., Ticks of the United States in Relation to Disease of Man. Jour. Econ. Ent. Vol. 30, No. 1, pg. 51, 1937.

In 1934 M. H. Hatch and Harriet Exline of the Wash. Exp. Sta. state that in Western Washington the black widow spider Latrodectus mactans is known only from Whidley Island, Fidalgo Island and some of San Juan Islands.¹ In 1936 the tick, Ornithodorus parkeri, recently described by Cooley and a possible vector of one disease, was collected by staff members of the Rocky Mt. Laboratory from a cotton-tail rabbit, ground squirrels, and a prairie dog near Yakima, Wash.² In 1936 R. S. Lehman reported a black widow spider was found in an outside dirt cellar at College Place, Washington.³ In 1937 Aedes aloponotum and Aedes cinereus were found about Lake Tapps, Pierce Co., Washington.⁴ In 1937 Tick Paralysis, which is a disease associated with the attachment of an engorging female, Dermacentor andersoni has been found in eastern Washington.⁵ In 1937 relapsing fever, an infection due to spirochetes which are transmitted by a species of the Ornithodorus was reported from Washington. The principle is Ornithodorus

¹ Hatch, M. H. Exline, Harriet. The Black Widow Spider. Jour. of N. Y. Ent. Soc. 52:449. 1934.

² Parker, R. R., Philip, B., Davis, Gordon, Cooley, R. A., Ticks of U. S. in Relation to Disease in Man. Jour. Econ. Ent. 30:(1)51. 1937.

³ Lehman, R. S., Black Widow Spider. Insect Pest Sur. Rep. 16:424. 1936.

⁴ Stage, H. H., Mosquitoes. Insect Pest Sur., 17:378. 1937.

⁵ Refer to (2).

parkeri.¹ In 1938 M. C. Lane found Rocky Mt. Spotted Fever abundant in the foothills of the Blue Mountains.²

In 1940 Hammon, Hammon and Howitt found the virus of St. Louis and Western equine encephalitis in the blood of man and horses in Washington. They also tested the blood of 162 birds and 153 mammals for the St. Louis virus and 172 birds and 161 mammals for the western equine virus. If the significance of their findings is confirmed it will indicate a much more wide spread potential reservoir for both viruses than has generally been suspected. It would appear that barnyard and fowl runs found in large numbers in small towns, rural and suburban areas, are the principle foci of infection for encephalitis of either the western equine or the St. Louis type.³

¹ Parker, R. R., Philip, B., Davis, Gordon, Cooley, R. A., Ticks of U. S. in Relation to Disease in Man. Jour. Econ. Ent. 30:(1)51 1937.

² Lane, M. C., Spotted Fever Tick, Insect Pest Survey Report, 18:136. 1938.

³ Hammond, William, Gray, John A., Evans, Francis, Izumi, Ernest. Western Equine and St. Louis encephalitis antibodies in the sera of mammals and birds from an edemic area. Science 94:305. Sept. 26, 1941.

In 1940 in the Yakima Valley, Washington, evidence was obtained by Hammon, Hammon and Howitt during the summer of 1940 indicating the probable presence in man and horses of both the western equine virus and the St. Louis virus. These workers outlined evidence which suggested a *Culex* mosquito as the likely vector of the latter. In May of 1941 an extensive coordinated field and laboratory survey of this region was begun. They succeeded in isolating both the St. Louis and western equine viruses from *Culex tarsalis* taken from collections where human encephalitis cases occurred. Experiments are now in progress to test the ability of *Culex tarsalis* to serve as a host to, and to transmit these viruses. The *Culex tarsalis* is the most common mosquito in the Yakima valley.¹

Oregon boasts information of some value on medical entomology. This is chiefly because of the government Mosquito Laboratory in Portland, which has, under H. H. Stage, contributed much information on the mosquitoes of the Columbia and Willamette River area. The work of W. J. Chamberlin

¹ Hammond, William, Reeves, William, Brookman, Bernard, Izumi, Ernest. Isolation of the Virus of Western Equine and St. Louis encephalitis from *Culex tarsalis* mosquito. Science 94:328. Oct. 3, 1941.

listing ticks is likewise of interest and importance.¹

Stage and Gjullin wrote an interesting article in 1935 which has received so little notice following its publication² that it is reproduced in part in this paper:

History of Malaria in the Pacific Northwest

In a search of the literature relating to malaria in this section, we have found but brief notes here and there. Von Ezdorf,³ in his "Malaria in the United States," 1915, has made the following statements: "Oregon Malaria is reported to have been more or less prevalent many years ago, but no cases are now known to originate in the state. Anopheles mosquitoes are also reported as not present in the state." "Washington.

¹ Chamberlin, W. J., The Ticks of Oregon. Ore. Ag. Exp. Sta. Bull. 349, June, 1937

² Stage, H. H. and Gjullin, C. M., Anophelines and Malaria in the Pacific Northwest, Northwest Sci., Vol. IX, No. 3, pp. 5-11, Sept. 1935. (Writer's note: The writer has the original manuscript of Mr. Gjullin as presented to the Seminar of Oreg. State College in Oct. of 1933. The material contained in the exposition on this and following pages, however, is quoted without comment from the reference cited above.)

³ Ezdorf, R. H. van; Malaria in the United States. Pub. Health Rep. 1915. Vol. 30, No. 22 (Reprint No. 277, pp. 19 and 24).

Malaria is a notifiable disease, but is reported to be comparatively rare." Barber, in his "History of Malaria in the United States," 1929, does not mention malaria in Oregon or Washington.

It was therefore with considerable interest that the authors in their mosquito studies of this region discovered numerous accounts of malaria by old residents or visitors. It appears to have been introduced over one hundred years ago, to have been an important factor in the decimation of the Indian tribes at that time, and since to have remained with varying degrees of intensity, endemic to at least the Willamette Valley, in Oregon.

We cannot be sure when the disease first made its appearance along the Columbia River, since our sources of information do not agree in this matter. It is likely that its presence first became known in 1829 or 1830. Bancroft¹ referring to a settlement of half-breeds, French Canadian servants of the Hudson Bay Company, and trappers from the United States and California says, "from 1829, this cluster of farms stood as a pot-flower of civilization in a wilderness

¹Bancroft, Hubert Howe: History of the Northwest Coast, San Francisco, 1884, vol. 2, p. 501.

of savagism, the sole effort of independent husbandry in Oregon.

"And strange to say, with these incipient ideas of fixed occupation, and their attendant forest-clearings, housebuildings, and soil stirrings came civilization's kindly savage-destroyer, disease, . . .

"That the ague and fever which in this year of 1829 . . . became epidemic and raged with such virulence as with the thousands of red men to carry off scores of white and wholly to depopulate certain sections, is to be attributed to the scratching . . . of a few acres . . . seems to me absurd . . .

"But whatever the cause, certain it is that when the soil around Fort Vancouver was first upturned to any considerable extent for cultivation, the fever and ague broke out among the natives in the form of fearful epidemic. White men as well as Indians were seized by it . . . and, during the years 1830, 1831 and 1832 the epidemic was even worse than in 1829."

John Dunn¹ agrees, "After having enjoyed a considerable respite from this visitation (smallpox), and recruited their force and numbers to some extent, they were again, in 1829, and some subsequent years, attacked by another malady, equally

¹ Dunn, John; History of the Oregon and British North America Fur Trade, London, 1844, pp. 115-116.

fatal--fever, attended with ague." Douglas¹ however, on his second visit to the Columbia, wrote, "October 11, 1830 . . . A dreadfully fatal intermittent fever broke out in the lower parts of this river about eleven weeks ago, which has depopulated the country. Villages, which had afforded from one to two hundred effective warriors, are totally gone; not a soul remains! I am one of the few persons among the Hudson Bay Company's people who have stood it, and sometimes I think, even I have got a 'shake!', and can hardly consider myself out of danger, as the weather is yet very hot." DeSmet² confirms the date mentioned by Douglas: "une fievre tremblante et contagiuse, qui se declara cette meme annee 1830...."

The epidemic was widespread and serious for several years. Dr. W. F. Tolmie³ a Scotchman assigned to Fort Vancouver during the period, wrote : "All through the year 1833 intermittent fever was very prevalent. A hospital was erected

¹ Douglas, David; Second Journey to the Northwestern Part of the Continent of North America. Reprinted from The Companion to the Botanical Magazine. Vol. 2, London, 1836.

² DeSmet, P. J.; Missions de l'Oregon et Voyages Aux Montagnes Rocheuses aux sources de la Columbia, de l'Athabasia et du Saschatshawin.

³ Tolmie, W. F.; Private Journal MS.

for Gairdner, in which there were usually from two to three hundred cases. All through the Shoshone country and thence throughout the region of the hypothetical river, Buenaventura, round Klamath and Pyramid Lakes and along the Willamette and Columbia Rivers the disease raged."

While there may be uncertainty as to the disease to which early historians refer, it nevertheless seems likely that it must have been malaria since the various accounts continually refer to "intermittent fever," "fever and ague," "ague," and even "malaria." The treatment and general symptoms are also indicative of chills and fever.

Information regarding the symptoms is meager, although fever and shaking or trembling is frequently recorded. Townsend¹ has written: "The symptoms are a general coldness, soreness and stiffness of the limbs of the body, with violent tertian ague."

The disease was most apparent during the late summer, the peak of which corresponds well with the reported cases of malaria in Oregon for the past 14 years. John McLeod,² Chief

¹ Townsend, J. K.; *Sporting Excursions to the Columbia River, and a Visit to the Sandwich Islands, Chili, etc.* London. Henry Colburn. 1840. Vol. II. p. 4.

² McLeod, Sr., John: *Journal and Correspondence of John McLeod*, Sr. London, Wm. Wesley and Son, 1914, MS.

Trader to the Hudson Bay Company at Fort Vancouver from 1812 to 1844, wrote on Feb. 25, 1831: "The intermitting fever which broke out here in August and was still (when I reached here on the first of November and for some time after) raging with great violence." Lee and Frost,¹ note: "In the month of August, in the time of harvest, the intermittent fever began to shake its burning, freezing subjects." Townsend,² speaking of the absence of Dr. Gairdner, the surgeon at Fort Vancouver, wrote in his journal: "October 1st, (1833) . . . In his absence, the charge of the hospital will devolve upon me, and my time will thus be employed through the coming winter. There are at present but few cases of sickness, mostly ague and fever, so prevalent at this season."

The treatment and history also indicates that it responded to the use of quinine. Townsend³ tells something of the attempted cures and described curing a little Indian girl of the fever with quinine after she had been tortured by the Indian

¹Lee, D. and Frost, J. H.: Ten Years in Oregon, New York, 1844, pp. 108 and 132.

²Townsend, John K.: Narrative of a Journey Across the Rocky Mountains. Philadelphia. 1839, pp. 233, 241.

³Ibid.

Medicine man. Allen.¹ tells of his use of quinine in the treatment of fever and ague: "In the fall of the year 1832, the fever and ague was very prevalent at Vancouver, and at one time we had over 40 men laid up with it, . . . and I well remember my tramps through the men's houses with my pockets lined with vials of quinine . . ."

Something has been set down too of the frequent relapses occurring in the same individual, a condition frequently observed at the present time when sufficient quinine has not been taken to effect a permanent cure. This is best illustrated in the case of Jason Lee and is taken from a photostat copy of the daily accounts of the Willamette Station Mission.²

"Friday, 20th May, 1836, J. Lee was suddenly seized with ague and on the following day had a very severe fit."

"Wednesday, 12th July, 1836. J. Lee yet quite unwell, not having recovered from the debilitating effects of ague."

"Sabbath, 14th August, 1836, Jason Lee was this morning seized with a sever fit of intermittent fever. . ."

"Saturday, 22nd October, 1836. J. Lee had another attack of intermittent and so severe as to deprive him of reason for a short time."

¹ Allen, George T.: *Reminiscences of Fort Vancouver, Oregon* Pioneer Associate Transactions. 1881, p. 79.

² Lee, J. and Lee, D.: *Mission Record Book, Methodist Episcopal Church, Willamette Station, Oregon Territory, North America, 1834-1837*. MS.

"Monday, 21st November, 1836. Jason Lee set out for Vancouver for the benefit of medical advice having been much reduced by repeated and severe attacks of fever and ague."

It is impossible to trace the introduction of the disease into the Pacific Northwest, but it was most likely "dragged across the plains," as one author aptly describes it. It is a well-known fact that parties from the East and South congregated at Independence, Mo., for their long journey into the Oregon territory. Is it unlikely that some coming from the lower Mississippi Valley brought with them the gametocytes to be scattered freely among the natives and their fellow travelers by the numerous anophelines in the country? It is possible, too, that it may have been brought in from the sea by sailors and travelers who had come from malarious belts in the United States, or had touched at Central America ports before reaching the Northwest. Be that as it may, the Wilke's Exploring Expedition during the years 1838 to 1842 apparently did not meet with the disease until they reached Oregon. Speaking of Dr. Babcock at the Methodist Mission near Salem, Wilkes,¹ writes: "He stated to me that the country was healthy, although during the months of August and

¹ Wilkes, Charles, Lieut. USN.: Narrative of the United States Exploring Expedition, Philadelphia, Lee and Blanchard, 1845, vol. r, p. 351; vol. 5, p. 218.

September they were subject to fever and ague in the low grounds, but in high and dry situations he believed they would be free from it. . . . " Somewhat later, in describing the tour of Lieutenant Emmons and his party on their journey from the Columbia to the Sacramento during September and October, 1841, is added: "Some sickness has made its appearance among the members of the party. Messrs. Emmons, Peale, Rich and Agate all had attacks of ague and fever, and the two last named gentlemen suffered much from this disease. Dr. Whittle ascribed these attacks to the length of time, nearly five weeks, during which they were encamped on the Willamette, and particularly to the position of the camp, immediately on the bank of the river, where it was subject to the damp and fogs."

This corroborates the statement of Herms.¹ "That malaria may have been introduced into this state (California) prior to the great gold rush in 1849 is possible, since Cleland states that Lieutenant Emmons and his party entering California in 1841 from Oregon, prior to his entrance into the Sacramento Valley were harassed by sickness, chiefly malaria."

An indication of the amount of malaria immediately after this period is recorded in "Medical Statistics of the United

¹ Herms, Wm. B.; Anopheline Mosquito Investigations in Calif. Fourth International Congress of Entomology. Ithaca, 1928, vol. 2, p. 708-711.

States Army," and was forwarded to us through the kindness of the Surgeon General of the War Department. For purposes of brevity, we have tabulated data of five representative years together with a total for the 36 years, 1849-1897:

Year	Strength	Malaria	All diseases	Per cent strength malaria	Per cent Malaria of all diseases
1849	366	89	721	23.1	10.9
1855	606	529	1,518	87.2	34.8
1859	2,294	168	3,251	7.3	5.1
1882	994	221	1,458	22.2	15.1
1897	955	10	552	.010	.018
1849- '97	33,288	4,223	40,821	12.7	10.3

Many living residents of Oregon recall considerable ague, particularly in the Willamette Valley, after 1850, although it occurred in minor and major epidemics.

In speaking with the writers about the disease, Dr. M. M. Davis of Eugene, Oregon, stated: "There was a great deal of malaria in the '50s and '60s and even up in the '70s. Again in the late '90s a milder attack broke out and there were cases in the intervening years, but they were not so numerous. I remember as a boy that nearly every family would have some malaria after school was over in June, and most of the sickness that occurred in the summer was malaria. Mother was a nurse, and because doctors were scarce in those days, she administered much quine and chill tonics."

Col. R. C. Ebert, Medical Corps, U. S. Army, retired, formerly Chief Surgeon of the Department of Columbia, made this statement in conversation with the authors: "Portland and the Willamette Valley had plenty of malaria in the '60's and '70s, and congestive chills were common. Some people even died with it at Vancouver Washington. Quinine was administered by the spoonful, and Jones and Ayers tonics were commonly used."

Present Status of Malaria in Pacific

Northwest

Malaria was first required to be reported to the State Health Officer in 1918. Since that year it has been reported as follows:*

	Cases		Cases		Cases
1920 ----	9	1925 ----	1	1930 ----	34
1921 ----	4	1926 ----	25	1931 ----	220
1922 ----	2	1927 ----	16	1932 ----	53
1923 ----	1	1928 ----	9	1933 ----	26
1924 ----	4	1929 ----	16	1934 ----	23

The peak of the season has been determined as the end of the first week in September. The records of reported cases in Washington State show but two in 1928, three in 1929, and three in 1930.**

*Furnished by State Health Officer of Oregon.

**Furnished by State Health Officer of Washington.

At the request of the State Health Officer, a malaria

survey of Lane County, Oregon, was first made by the authors in the early fall of 1931. It was found that there was a decided epidemic of the disease centering particularly about the Noraton School District, part of which lies in northern Lane County and part in the southeastern tip of Benton County. A house-to-house canvass of the district disclosed 24 families, totaling 102 individuals, having authentic records of 41 cases of malaria. Only six families had not suffered an experience with the disease. From the data obtained from the heads of the families in the district, it was found that the typical case cost \$14, viz, two visits by a doctor at \$5 each, and four bottles of quinine at \$1 each. There are a considerable number of permanent ponds in the neighborhood, probably totalling about 100 acres of water surface, and anopheline larvae were easily taken at all of them. A search of the outbuildings also produced a plentiful supply of adults of both species.

In 1932 there were not so many cases in the Noraton School District, nor is it probable that there were so many in the counties at large although 53 were reported to the State Health Officer. During the house-to-house canvass in 1932, we questioned 28 families totaling 121 individuals, of which families 26 had had cases of the disease. Of the 28 dwellings inspected, only one was fairly well screened with

16-mesh screen, and 17 had no screens at all. Accurate figures for the total number of days all individuals living in the district were sick with malaria, and the number of days sick with all other diseases, could not be obtained for the year 1931, but the proportion must have been very unequal. However, in 1932, by more frequent visits, we were able to secure a better check on these figures and have tabulated them as follows:

Noraton School District

Assessed Valuation of District, \$42,000 (1932)

Number of families.....28	Number of individuals.....121
Cases of malaria.....26	Total days sick with
Total days sick with all	malaria.....161
other diseases.....31	

On December 7 and 8 a blood index was also made of this district. Smears were made from 78 individuals, and four, or 5.1 per cent, were found positive for tertian malaria, Plasmodium vivax. These smears were taken from all available individuals and were not limited to persons who had previously had symptoms of the disease. Only tertian malaria has ever been reported by attending physicians.

It seems possible that this more recent aggravated epidemic of malaria had been started by a migration of over 100 Oklahomans into the country. If carriers of the gametocytes came into the neighborhood there was certainly a goodly supply of the anophelines to spread it over the countryside. The

climate, too, seems favorable to a reasonable degree for the development of the mosquitoes, for we find that all field crop plants, except a few of those typical of the Cotton Belt, such as tobacco and cotton (and even these can be grown), are found in the Willamette Valley, although the summers are not so warm and moist as in the Southeastern part of the United States, being rather cool and dry. The permanent ponds of clean water evidently supported a thriving population of anophelines, nevertheless."

VI.

BIOGRAPHIES OF NORTHWESTERN ENTOMOLOGISTS

It is difficult to decide just which persons to include in this section. Obviously some attention should be given to the "old-timers." Yet such information is almost incredibly hard to collect and in some cases next to impossible. Considerable further research is necessary before their lives and work can be written in any detail. Therefore, the writer considered it advisable to obtain such information as he could upon those persons who had done their major work in the Northwest and in particular to obtain biographical information upon those entomologists who are living and working in the Northwest at the present time. Many of the persons who are in this area will, in due time, scatter with the nature of their work, retire, or occasionally be remembered only by an all too brief obituary. Hence the writer considered that he should obtain all of the current information possible. Some readers may wonder at omissions. These are unfortunate but largely excusable due to lack of data. Those persons mentioned, unless otherwise indicated, furnished their own auto-biographical data in a generous response to 500 form letters sent out by the writer during the winter of 1942, or the information was obtained from the author's personal correspondence.

ALEXANDER, CLAIR C. (1912 -)

Born Dec. 3, 1912, at Dayton, Ohio: present Junior Entomologist, U.S.D.A. BE&PQ; B. S. Purdue, M. S. Ohio State; Kentucky Field Scout, Corn Borer Project 1931; Ohio C.W.A. Mosquito Control Project Supervisor 1933-1934; Agent, Indian Chinch Bug Control Project 1934; Sherwin-Williams research fellowship; Field Aide, U.S.D.A. Codling moth Investigations, Indiana, 1939-1940; Ohio State Ent. Soc., Thomas Say Ent. Soc. Purdue, Sigma Xi; published on nicotine sprays; Wenatchee, Washington.

ALLEN, THOMAS CORT (1899 -)

Born May 13, 1899, Newark, N. J.; Assistant Professor Dept. Econ. Ent. Univ. Wisconsin, Madison; B. S., M. S. Oregon State College, Ph. D. Univ. Wisc; Phi Sigma, Sigma Xi; assisted in Ent. at O.S.C., 1926-1928, Research fellowship at O.S.C. 1928-1929; Research assistant Econ. Ent. Univ. Wisc. 1929-1932. Instr. Econ. Ent. Univ. Wisc. 1932-1937; ten publications on econ. ent.

ANDERSON, ERNEST CLIFFORD (1913 -)

Born Ashton, Idaho; Grad. Ass't. Zool. O.S.C.; B. S. Univ. Idaho 1940; M. S. Oregon State College, 1942; Field Aide cricket control 1936-1938; Supervisor pea weevil control, Payette, Idaho, 1940; Field Agent, Ore. Ag. Exp. Sta. 1941; Phi Sigma, Sigma Xi; (associate).

ANDISON, HARRY (1913 -)

Born Feb. 20, 1913 at Steveston, B. C., Canada; Ag. Ass't. in Entomology, Dom. Ent. Lab. Victoria, B.C.; B.S. Univ. Brit. Columbia; Ag. Ass't. Dom. Ent. Lab. Victoria, B.C. since 1934; Ent. Soc. B.C.; seven publications.

BAKER, JAMES H. (1910 -)

Born Aug. 24, 1910 at Baker Oregon; schooling in same city; Ore. Ent. Soc.; large private collection of Elateridae, Geometridae.

BAKER, WILLIAM WILLARD (1897 -)

Born Mar. 17, 1897 at Stillman, Illinois; Ass't. Entomologist, Berry Insects BE&PQ, Puyallup, Wash.; B.S. North Dakota Ag. College; Entomologist West. Wash. Exp. Stat. Puyallup 1927-1930; Jr. Ent. BE&PQ 1931 --; Am. Assoc. Econ. Ent., Ent. Soc. B. C., N. W. Sci. Assoc., Puget Sound Ent. Soc.; interested in Rhynchophora; 13 publications; a fundamentally sound economic entomologist who is rated highly by those who know him.

BEDARD, WILLIAM DELLES (1906 -)

Born Sept. 13, 1906 at Rochester, N. Y., Associate Entomologist BE&PQ; B.S. N. Y. State Col. Forestry 1929; M.S. and Ph.D. Univ. Mich. 1931 and 1937; Instr. Univ. Mich. 1931; Ass't. Ent. BE&PQ 1932-1937, Assoc. Ent. PE&PQ 1938--; Sigma Xi, Phi Sigma, Am. Ent. Soc., A.A.E.E., Soc. Am. For.; interested in forest entomology; six publications.

BLACK, A. BURR (1892 -)

Born Aug. 23, 1892, at Forest City, Iowa; Oregon State Apiary Inspector; B.S. Oregon State College, 1916; M.S. at same institution 1939; Research fellow, O.S.C., 1917-1918; Ass't. Ent. Ore. Ag. Exp. Sta. 1919; high school teacher 1918-1935; Grad. Ass't. Ent. O. S. C. 1937-1939; Ore. Ent. Soc.; Phi Sigma; interested in bees; one publication.

BOCK, JOHN FREDERICK (1906 -)

Born Jan. 1, 1906 at Silverton, Oregon; Horticultural Inspector, Clackamas County Oregon; B.S. Oregon State College 1931; Am. Assoc. Econ. Ent.

BONNELL, DANIEL ERNEST (1911 -)

Born Apr. 12, 1911 at Little Rock, Ark.; Instructor in Entomology at Oregon State College; obtained a B.S. in Education at the University of Washington, worked toward a M.S. in Zoology until 1938, and received a Ph.D. from Oregon State College in 1942; Undergraduate Ass't. in Zoology, University of Washington, 1935-1936; Fellow in Zoology at Washington, 1936-1938; Field Aide, BP&PQ, Forest Insect Division, 1936; Laboratory Instructor in Zoology, Washington, 1937-1938; Graduate Ass't-Artist at Oregon State College, 1939-1941; Entomologist, Klamath Midge Commission, 1939; Agent, P-I, BE&PQ, Pear Psylla Control, Spokane, 1940; Ass't Entomologist

Ore. Agric. Exp. Sta., 1941; present position 1941-1942; is interested in medical entomology, history of entomology, and Carabidae; has published several papers; is a member of Sigma Xi; Ent. Soc. America, Puget Sound Ent. Soc., Gamma Sigma Delta; Oregon Ent. Society.

BREAKEY, EDWARD PAUL (1900 -)

Born July 5, 1900 at Phillipsburg, Kansas; Entomologist, West. Wash. Ag. Exp. Sta. Puyallup; B.S. Univ. Kans. 1924; M.A. Univ. Kans. 1927; Ph.D. Ohio State Univ. 1932; Field Ent. Ent. Comm. Kans. 1924-1926; Field Ent. Wisc. Dept. Agric. 1927-1930; Ass't Ohio Bio. Surv. 1930-1932; Institute Fellow in Ent. Ohio State, 1932-1936; Indust. Fellow. Mellon Inst. Univ. Pittsburg 1936-1938; Puget Sound Ent. Soc., Ent. Soc. Am., Am. Assoc. Econ. Ent.; interested in leaf-hoppers; several publications.

BRINDLEY, THOMAS ALBERT (1906 -)

Born Nov. 18, 1906 at Madison, Wisconsin; Ass't. Entomologist, Truck Crop Insect Control BE&PQ; B.S. 1928, M.S., Ph.D., 1931, Iowa State College; Grad Ass't. Iowa State College 1929-1931; Ass't. Ent. BE&PQ 1931-1938, Assoc. Ent., 1938--; Sigma Xi; Phi Kappa Phi, Gamma Sigma Delta; several publications on pea weevil control.

BRUHNS, BARBARA GRAY (1910 -)¹

B.S. 1932; B.A. (Librarianship); M.S. 1936, Univ. of Wash.

¹ From an unpublished manuscript of M. H. Hatch.

Assisted in Zool. 1933-35; Seattle Public Library; Housewife.
Coleoptera; Carabidae.

BUCKELL, EDWARD RONALD (1889 -)

Born April 8, 1889, Romsey, Hampshire, England; Entomologist in charge, Field Crop Insect Laboratory, Dom. Div. Ext., Kamloops, B.C., Canada; B.A., Cambridge, England; Ass't Ent. B.C. Prov. Dept. Ag. 1917-1921; Dom. Div. Ent. 1922--. Am. Ent. Soc., Econ. Soc. Am., A.A.A.E., Ent. Soc. B.C.; interested in Orthoptera and Odonata of B.C.; twenty-seven publications.

CASSIL, CARROL CLAYTON (1911 -)

Born Dec. 17, 1911, Kansas; Assoc. Chemist, BE&PQ, at Yakima, Wash.; B.S. Geo. Washington University; Ass't. Scientific Aide 1934-1937; Junior Chemist 1937-1939; Ass't. Chemist 1939-1940; Assoc. Chemist 1940 --; Am. Chem. Soc., A.A.A.E., Sigma Xi; interested in insecticides; twenty-four publications.

CHAMBERLIN, WILLARD JOSEPH (1890 -)

Born on August 12, 1890 at Claburne, Texas; Major, United States Army Air Corps (Associate Professor of Entomology on leave from Oregon State College); resided in Texas, Colorado, California and in Oregon since 1912; married Freida L. Jones of Astoria, Oregon in 1917, and four children have

been born to the Chamberlin's. He has a B.S. in 1915 and a M.S. in 1921 from Oregon State College; and a Ph.D. in 1930 from Stanford University. Chamberlin, although a graduate in forestry, was appointed as an Instructor in Entomology in 1916. In the following year, when America entered the first World War, he entered the Signal Corps of the United States Army and soon qualified as an aviator. He served with the 91st Aero Squadron as a First Lieutenant throughout the war and briefly with the Army of Occupation, was shot down, and, even though an observed, is credited with two and a "half" enemy planes. He was one of the first 1000 to receive an aviator's rating from the International Aeronautical Association. He returned to Oregon State College as an Instructor until 1926, was appointed and served as Ass't. Professor from 1921-1928, and as Associate Professor from 1928 until 1941, when he obtained a leave of absence and re-entered the Service. He is a member of Gamma Sigma Delta, Sigma Xi, and the Oregon Ent. Soc. He was President of the McAlexander Chapter, Officer's Reserve Association in 1929; President of the Biology Club at O.S.C. in 1932; Senior Vice Commander Dept. of the Veterans of Foreign Wars 1923; Dept. Commander of the American Legion 1934-1935 and more recently National Committeeman; District Deputy of Knights of Columbus in 1923,

1926, 1931, and 1933. He is a nationally recognized forest entomologist, inaugurator of forest airplane dusting in the northwest, an authority on Buprestidae, has published numerous articles and three outstanding entomological textbooks. Sharp-tongued "W. J." is universally respected and admired by his large number of friends and associates. He is, at present making the same enviable record in the Service that he has established in civil life.

CODY, CHARLES ERNEST (1908 -)

Born July 4, 1908 at Mound City, Kansas; Entomologist B. E. Maling Canning Co.; Oregon State College Student; Lab. Ass't. C.W.A. Mosquito Control Project 1933-1934; Field Ass't. Ore. Ag. Exp. Sta. 1935; Sup't. W.P.A. Mosquito Control Program 1937; interested in vegetable insects; several small economic circulars.

COWAN, IAN McTAGGART (1910 -)

Born June 25, 1910 at Edinburgh, Scotland; Ass't. Professor of Zoology, Univ. Brit. Columbia; B.A. Univ. Brit. Col., Ph.D. Univ. Calif.; Insect Pest Investigator, Can. Dept. Agric. 1929; Ass't. Director B.C. Prov. Museum, 1935-1940; interested in insects parasitic on mammals and is doing some particularly fine work.

CRUMB, SAMUEL EBB SR. (1880 -)

Born June 11, 1880 at Galena, Kansas; Retired entomologist

BE&PQ at Puyallup - Sumner; B.A. Univ. of Kansas; Ass't. Ent. Texas 1908; BE&PQ 1909-1937; Ent. Soc. B.C., Puget Sound Ent. Soc.; interested in noctuid larvae; nineteen publications.

CRUMB, SAMUELL EBB JR. (1917 -)

Born Oct. 24, 1917 at Clarkesville, Tenn.; Officers Candidate School, Carlisle Barracks, Pa.; B.S., Oregon State College; Field Ass't. Ag. Exp. Sta., 1937; Ass't. Field Aide BE&PQ, 1939; Ass't. Field Aide BE&PQ, Puyallup, 1940; Research Fellow, Ore. State Coll. 1941; Ore. Ent. Soc., Puget Sound Ent. Soc; interested in tachinidae.

CUIMORE, RALPH ERSKINE (1912 -)

Born June 18, 1912 at Westview, Saskatchewan, Canada; Salesman, Canadian Industries Limited; B.S.A., Univ. British Columbia; Ass't. Dom. Exp. Sta. Summerland, B.C., 1935-1937; Ent. Soc. B.C., Ent. Soc. Ontario.

CUMMINGS, MELVIN S. (1920 -)

Born Apr. 24, 1920 at Bozeman, Montana; Oregon State College Student; B.S. Oregon State College 1942; Phi Sigma, interested in aquatic insects.

CURTIS, LESLIE COLIN (1904 -)

Born Apr. 13, 1904 in London, England; Science teacher, Kamloops B.C. High School; B.A. Univ. Brit. Columbia; Ass't. Dom. Ent. Lab., Kamloops, 1938-1939. Ent. Soc. B.C.; interested

in Diptera; two publications.

DAVIS, JOHN EMERSON (1889 -)

Born June 1, 1889 at Manston, Wisc.; Graduate Assistant in Entomology at Oregon State College; Albany College (Oregon) B.S. 1932; M.S. Oregon State College 1939; Sigma Xi.(assoc.) Phi Sigma, Gamma Sigma Delta; Ore. Ent. Soc., Ent. Soc. Am., A.A.E.E. interested in aquatic insects.

DENNYS, ARTHUR ALEXANDER (1894 -)

Born June 27, 1894 at Mussoori, India; Junior Agricultural Scientist, Entomological Branch, Dominion Dept. Agric., Ottawa; St. Lawrence College (Ramsgate) and Dulivich College and Battersea Polytechnic, of London, England; Insect Pest Investigator 1925-1926; Junior Entomologist 1926-1936; as above from 1936; all with Dominion service; interested in moths and insecticides.

DE BREY, THOMAS (LORD WALSLINGHAM) (1843-1919)¹

Walsingham traveled in the western United States in 1871-1872. Born in 1843 and educated at Cambridge, England; he had gained a considerable reputation as a big game hunter and collector of micro lepidoptera when he came to America. In

¹ Essig, E.O., Itinerary of Lord Walsingham in California and Oregon, 1871-1872. Pan Pacific Entomologist, Vol. XVII, No. 13 July, 1941.

addition to his California travels, Walsingham came north into Oregon between Sept. 16, 1871 and June 17, 1872, and unfortunately not much data is available regarding the trip. The map made by the party shows however, that the party were in Klamath County, Fort Harney, Canyon City, Fort Watson, Bridge Creek, Cherry Creek, Currant Creek, Antelope Creek, Deschutes Bridge, and north to the Dalles, the party then made the trip to Portland via boat and south to the approximate vicinity of Eugene by rail. From there the route was approximately by Roseburg, Grants Pass, to Crescent City, California. Walsingham fished, hunted, and collected lepidoptera at every opportunity. His diaries and collection of 50,000 specimens were presented to the British Museum of Natural History in 1910.

DOHANIAN, SENEKERIM M. (1889 -)

Born Oct. 12, 1889 in Armenia; Associate Entomologist BE&PQ Filbert Insect Lab., Eugene, Ore. since 1937; B.S. Tufts College; M.S. Harvard Univ.; Gypsy Moth Parsite Lab., 1915-1927; Europ. Corn Borer Lab., 1928-1934; Div. Foreign Parasite Introductions 1935-1936; A.A.A.S., A.A.E.E., Cambridge Ent. Club, Ent. Soc. Wash., Harvard Forestry Club.

DOUCETTE, CHARLES FELIX (1898 -)

Born on June 16, 1898 at Wilmington, Massachusetts; Associate Entomologist in charge of BE&PQ Bulb Insects Field Laboratory in Sumner, Wash.; he attended grammar school in

Wilmington and high school in Melrose, Mass.; B.S. from Mass. State College, He has been associated with the U.S.D.A. since January of 1921 when he was placed in charge of the Greenhouse Insects Lab. in Pennsylvania. He was later transferred to Santa Cruz, Calif. to establish and take charge of the Bulb-Insects Lab. in 1925. He was transferred again in 1927 to Puyallup, Wash. to establish and take charge of a Bulb-Insects Lab.; this laboratory was moved to Sumner in January 1929. He is a member of: A.A.E.E., Ent. Soc. Am., Ent. Soc. B.C., Puget Sound Ent. Soc., A.A.A.S.; he has nine publications.

DOWNES, WILLIAM (1874 -)

Born in 1874 at Staverton, Devon, England; Agricultural Scientist, Entomological Branch, Dom. Dept. Agric., Officer in Charge, Victoria, B.C.; attended Bristol Grammar and Newton College in England and has been in charge of the Victoria Laboratory since 1917; is a member of the A.A.E.E., Ent. Soc. B.C., NW. Assoc. Hort. Ent. Plant. Path; interested in hemiptera and homoptera; is the author of more than twenty papers on economic insects and is accounted as one of Canada's leading economic entomologists. He is a personally charming man whose judgement and knowledge are respected by his friends and associates.

EERNISSE, FREDERICK ARIE (1900 -)¹

B.S. 1930, M.S. 1932 Univ. of Wash; Curculionidae.

EICHMANN, ROBERT DURWARD (1910 -)

Born March 17, 1910 at Boise, Idaho; Ass't. Entomologist at Wash. Ag. Exp. Sta., Pullman, Wash. He received his grammar and high school education at Boise and later attended the College of Idaho, at Caldwell. He has a B.S. from Oregon State College and an M.S. from Montana State College. He was: field ass't at Ore. Ag. Exp. Sta., 1933; field and laboratory ass't. at Montana State 1934-1937, and has been at his present position since 1937. He is a member of Gamma Sigma Delta, Phi Sigma and Sigma Xi. He has published five economic papers.

ELLERTSON, FLOYD ELROY

Born Sept. 11, 1919 at Silverton, Oregon; Senior Student at Oregon State College; attended grammar and high school at Bethany and Silverton in Oregon and attended Mr. Angel College; a member of the Ore. Ent. Soc.; interested in general collecting; after graduation will attend Naval Academy at Annapolis and will be commissioned in U.S.N.

FARRAR, ELIZABETH (1908 -)²

B.S. Univ. of Wash. 1930; M.S. 1936; Assisted in Zool. 1931-1933; Coleoptera: Carabidae: Bembidiini.

¹From an unpublished manuscript of M. H. Hatch.

²Ibid.

ELLSWORTH, ELIZABETH G.

Born April 18, 1914 at Central Point, Oregon; Ass't.
Technician and Illustrator in the Dept. of Entomology, Oregon
State College; attended grammar school at Rose City Park and
Grant High School in Portland; a member of the Oregon Ent.
Soc. and interested in scientific illustrating; a senior
student at Oregon State College

FENDER, DOROTHY McKEY (Mrs.) (1916 -)

Born March 13, 1916, at Hubbard, Oregon. Grad. Ass't.
in Biology at Linfield College; "played with caterpillars
until the fuzz wore off---this at the ripe old age of four."
Collected beetles in high school but reluctantly dropped the
project when no one else seemed interested; obtained a scholar-
ship at Linfield College and later an assistanship in Research
at the same institution under Prof. James A. McNab; was "intro-
duced to Kenneth Fender on a Research trip and common interests
brought about further associations which were culminated in
marriage." Has a B.A. from Linfield and did special studies
at Oregon State College. She is an attractive young woman,
knows considerable about Oregon coleoptera and, together with
her husband, has a fine collection. Has two publications.

FENDER, KENNETH MARK (1910 -)

Born Apr. 7, 1910 at McMinnville, Oregon. He is a
federal employee in that city and is 1941-1942 President of

the Oregon Entomological Society; attended Linfield College and was employed as a Research Ass't. there; with his wife, he is now writing a Check-List of Oregon Coleoptera. At the suggestion of Ralph Hopping the Fenders are studying Cantharidae. Fender has a large collection of butterflies and has three publications. In addition he has identified Cantharidae for numerous private collectors and the Univ. of Minnesota and Ohio State University.

FERGUSON, GEORGE RAY

Born Jan. 8, 1915 at Bolivar, Louisiana; Ass't. Entomologist at Ore. Ag. Exp. Sta.; B.S. and M.S. Oregon State College in 1936 and 1939; attended grammar and high school in Hollywood Calif. and spent some time at U.C.L.A.; did additional graduate work at Univ. of Calif. at Berkely and got a Ph.D. from Ohio State University in 1941. From 1937 to 1939 was an Assistant in Ent. at Oregon State; from 1939-1940 was Graduate Ass't. at Ohio State, spent 1940 as a Research Fellow and 1940-1941 as University Fellow at the same institution. Belongs to Phi Sigma, Gamma Sigma Delta, and Sigma Xi; particularly interested in Hymenoptera, physiology, and Insect toxicology. His opinion is greatly respected by his associates and he is an ardent collector.

FISHER, ROBERT A.

Born June 10, 1910 at Roundup, Montana; Ass't. Entomologist

and Ass't. Professor at the University of Idaho; B.S. Univ. of Idaho, M.S. 1934, Ph.D. Iowa State College 1938; field aide 1934-1936, Junior Entomologist 1937-1938 BE&PQ Truck Crop Insects Division; assumed his present position in 1939; is a member of Sigma Xi; interested in insect physiology, economic insects; has three publications and is esteemed by his associates at Idaho.

FOSTER, RAYMOND EDWIN (1919 -)

Born Apr. 4, 1919 at Vancouver, B.C.; Ass't. in Biology at Univ. of British Columbia; B.A. with Honours from the same institution in 1942; a member of the Ent. Soc. B.C., and Vancouver Nat. Hist. Soc.; interested in forest insects; one publication.

FOUTS, ROBERT M. (1899 -)

Born May 4, 1899 at Washington D.C.; Field Aide BE&PQ at Eugene, Oregon; received B.S. Univ. of Calif; has held various positions with the U.S.D.A. since 1914; is a member of the Wash. Ent. Soc., interested in Hymenoptera; has published about twenty-four papers on the Serphoidea.

FOX, DAVID E. (1904 -)

Born July 8, 1904 at Hillsboro, Texas; Ass't. Entomologist, BE&PQ; B.S. Montana State, and M.S. Univ. of Minn.; Junior Entomologist 1929-1940 with BE&PQ; member of Ent. Soc. Em.; three publications.

FULTON, HARRY GRAHAM (1902 -)

Born Dec. 19, 1902 at Vancouver, B.C.; Agricultural Ass't., Insect Pest Investigations, Dom. Dept. Agric., since 1934; B.S.A., from Univ. Brit. Columbia; a member of the Ent. Soc. B.C.

GABB, WILLIAM MORE (1839 -1878)¹

Born in Philadelphia Jan. 20, 1839; a pioneer explorer geologist, paleontologist, and entomologist who, as a member of the California State Geological Survey, traveled and collected in Oregon, Washington territory, and Vancouver Island in the years 1863 and 1864.

GAVIN, ARTHUR PATRICK (1920 -)

Born Aug. 10, 1920 at Portland, Oregon; Chief Clerk, Boeing Aircraft Co., Seattle; went to Wash. high school in Portland and to Oregon State College; has been employed as an Ass't. Ent. with Portland Earwig Lab. and Mosquito Control 1932-1941; interested in tachinidae and aquatic insects.

GETZENDANER, CHARLES W. (1899 -)

Born May 9, 1899 at Champion Nebraska; Junior Entomologist BE&PQ, Union Gap, Wash., B.S. Hastings College, 1923; with U.S.D.A. since 1929; A.A.A.S., A.A.E.E., Puget Sound Ent. Soc.; interested in Cicindelidae; four publications.

¹ Essig, E. O., Hist. of Ent., the Macmillan Company of New York, 1931. pg. 638.

GIBSON, KENNETH EDWARD (1905 -)

Born Nov. 15, 1905 at Buena, Wash.; Junior Entomologist BE&PQ; attended grammar and high schools at Parker and Toppenish; B.S. from Whitman College 1925, and M.S. from W.S.C. 1928; has been with U.S.D.A. since June 1927; Phi Kappa Phi, A.A.E.E.; collects and exchanges Buprestidae and Elateridae; one publication.

GJULLIN, CLAUDE MELVIN (1903 -)

Born May 16, 1903, at Little Falls, Minnesota; Agent, BE&PQ Mosquito Control Lab., Portland; B.S. Montana State College, M.S. Oregon State College; has been with U.S.D.A. since 1930; interested in Diptera and medical entomology; four publications.

GLENDENNING, REGINALD (1888 -)

Born in 1888 in London, England; Ass't. Agric. Scientist, in charge, Agassiz Lab. B.C.; Royal Horticultural Society, School of Hort., England; has been with the Dom. Dept. Agric. Ent. Div. since 1921; member of Ent. Soc. B.C.; interested in aphididae; has published several papers on aphids and papers and circulars on the economic insects of B.C.

GODDARD, VICTOR EDWIN LLEWELLYN (1900 -)

Born Oct. 8, 1900 at Cochrane, Alberta; Dom. Customs Excise Officer at Victoria B.C.; general interested in insects; member of Ent. Soc. B.C.

GRADY, HOWARD JOSEPH (1903 -)

Born June 11, 1903 at Oakdale, Penn.; Ent. Calif. Spray Chem. Corp., Portland; B.S. Univ. of Kansas; has been an entomologist with the above firm since 1926, eight and a half years of which were spent in Europe and North Africa on pest control investigations; privately interested in Psyllids; neat, urbane, well-liked, well-informed.

GRAHAM, HOWARD EDWARD (1917 -)

Born Oct. 10, 1917, at La Grande, Oregon; Apiary Inspector for State of Oregon; B.S. Oregon State College; has been with State of Oregon Agric. Dept. since 1938; member of Ore. Ent. Soc.; interested in bee culture.

GRAY, KENNETH WEISNER (1905 -)

Born Aug. 31, 1905 at Marquam, Oregon; Associate Ent. Ore. Ag. Exp. Sta., Corvallis; B.S. and M.S. Oregon State College; member of Ore. Ent. Soc., and A.A.E.E.

GREGSON, JOHN DOUGLAS (1910 -)

Born June 17, 1910 at Blackfolds, Alberta, Canada; Ass't. Ent. Dom. Livestock Insect Lab., Kamloops, B.C.; B.A. Univ. British Columbia in 1934 and M.S. Univ. of Alberta in 1936; was Fellow in Zoology at Univ. of Alberta; has been in present position since 1936; member of the Ent. Soc. B.C.; generally interested in Coleoptera; fourteen publications.

HARDY, GEORGE AUSTIN (1888 -)

Born in 1888 at Swansea, Wales; Botanist, Provincial Museum, Victoria, B.C.; attended grammar and high school at Battersea in London, and Glasgow, Scotland; graduated from Scotland Technical College and the Univ. of London; Essex Field Museums, London, 1919-1923, and has been at Victoria since 1924 as a museum ass't., biological ass't, and since 1941 as a Botanist; member of Ent. Soc. B.C.; interested in Cerambycidae and Buprestidae; a quiet, charming and thoroughly capable entomologist.

HATCH, MELVILLE HARRISON (1898 -)

Born Nov. 25, 1898 in Detroit, Mich.; Prof. of Zoology, University of Washington; Hatch at an early age began to show an interest in animals, indeed, at the age of nine he set out to compile a catalogue of the animal kingdom! Hatch's first contact with professional zoology occurred in 1915-1916 during his freshman year at Pomona College, Calif., when he had his first course in entomology. He entered the University of Mich. in 1916 and received three degrees: B.A., 1919; M.A., 1921, and Ph.D., 1925. His special interest in Coleoptera dates from 1917. In 1917-1918, 1919-1921, and 1923-1924 Dr. Hatch served as a Laboratory Ass't in Zoology at Mich. His first full-time position was at Syracuse University 1922-1923 as an

Instructor in Zoology. Then, with the first draft of his doctor's thesis completed and an appointment as Associate Professor Biology at James Millikin University (Decatur, Illinois) for the following year, he married at Ann Arbor, Michign, July 24, Estella Rebecca Jacka of Calumet, Mich. (Two children have been born to the Hatch's, Paul in 1925 at Ann Arbor, and Suzanne, 1929, in Seattle). From 1925 to 1927 he held two temporary positions at Michigan and at the University of Minn.; in 1927 he came to the Univ. of Wash. to teach entomology and zoology. He was ass't. professor from 1927-1934, associate professor 1934-1941, and is now full professor. At the Univ. of Mich, Hatch was a member of Phi Sigma and Sigma Xi. He has been president of the Wash. Chapter of Sigma Xi, 1934-1935, and since 1933 has been National Vice-Chancellor of Phi Sigma. He is also a member of the Ent. Soc. Am, Ent. Soc. Wash., Societe' Entomologique de France, Am. Soc. Zoologists, History of Science Soc., Puget Sound Ent. Soc., Ent. Soc. B.C., and a Fellow of the A.A.A.S. Hatch has a very large private collection of Coleoptera, a magnificent private library and still has considerable trouble in deciding whether he is a zoologist or a philosopher. He is primarily interested in the Coleoptera of Wash., founded the Scarab Society, and aided in the formation of the Puget Sound Ent. Soc. He has turned out some excellent graduates,

is a premier taxonomist, has published approximately 100 papers, is a genuine scholar, and is respected and admired by all who know him.

HERIOT, ALLAN DOUGLAS (1875 -)

Born in 1875 in London, England; attended Barnet and Highgate in England and Koenigsfeld in Baden, Germany, now retired; member of Ent. Soc. B.C.; interested in Adelginae; seven publications.

HERR, CLARENCE WILSON (1863 - 1938)

Born in 1863 in Dayton Ohio; did much collecting in the Northwest and in California and Western Canada; he exchanged butterflies and moths all over the world; his collection of Lepidoptera is now in the possession of Mrs. C. W. Herr of Woodburn, Oregon. He was an original and conscientious collector and preparator. The collection numbers about 5,000 specimens, many of them rare or exotic, and in specially built cabinets.

HOPPE, GERTRUDE, (1910 -)¹

B.S. Univ. of Wash. 1932; M.S. 1934; Plecoptera

HOPPING, GEORGE REDSTONE (1899 -)

Born Nov. 14, 1899 at Kaweah, California; Forest Ent. Science Service, Canadian Dept. Agric. at Vernon, B.C.

¹ From an unpublished manuscript of M. H. Hatch.

attended Berkely high school, the Univ. of Calif. and has a B.S. from Oregon State College and an M.S. from Iowa State College; Pest Investigator, Canada, 1921-1924; Junior Ent. Canada, 1925-1927, Ass't. Ent., Canada, 1927-1939, Ent. in charge, Vernon Lab., Canada, since 1940; member of Sigma Xi, Ent. Soc. Am., Ent. Soc. B.C.; interested in forest insects; thirteen publications.

HOPPING, RALPH (1868 - 1941)

Born April 8, 1868, at New York City; former Senior Ass't. Agric. Scientist upon retirement; attended Rutgers College; Forest Examiner, U.S. Forest Service 1912-1919; Forest Ent., Can. Dept. Agric., 1919-1939; a member of A.A.A.S., Ent. Soc. Am., Ent. Soc. B.C.; greatly interested in Cerambycidae and Buprestidae; thirty-seven publications.

HOVERSON, JULIUS CHARLES GERARD (1906 -)

B.S., Univ. of Wash. 1928; M.S. 1930; Assisted in Dept. Zool. 1928-1930; Curator of Lab. at Friday Harbor Marine Biological Lab., 1930-1931; teacher at Centralia Junior College, Wash., Psychodidae.

HSIAO, TSAI YU (1905 -)

Born 1905 in Shangtung China; Ass't. Technician in Ent. at Oregon State College; attended Peiping Univ. in China; has a B.A. 1931 and M.S. 1938 Oregon State College, and a Ph.D.

from Iowa State College; is a member of Sigma Xi, Phi Kappa Phi, Phi Sigma, and Ore. Ent. Soc; interested in Hemiptera, especially the Miridae; two publications; war has held up his accepting a professorship at Hongkong University.

HUBBARD, C. ANDRESEN (1898 -)

Born Dec. 10, 1898 at Portland, Oregon; Professor of Biology, Pacific University, Forest Grove, Oregon; Bachelor of Education, M.S., and Master of Education, all from the Univ. of Wash., and Sc.D. from Pacific Univ.; Fellow in Zoology at Univ. of Wash., Research Specialist, Oregon State Game Commission, 1922-1923; Naturalist, Crater Lake National Park 1933; present position since 1922; is a northwestern authority on fleas and has published ten papers on western fleas.

JACOB, JOHN KENNETH (1911-1941)

Born in 1911, attended the Prince of Wales school and entered the Faculty of applied Science at U.B.C. in 1933; graduated in forest engineering in 1933; switched to Arts with a B.A. in 1935 and then took an M.A. with first class honours in Zoology and Botany in 1938; under a Carnegie Graduate Fellowship he made a survey of insects affecting stored food products in Canada; was a collector of the Dom. gov't.; was proceeding to Stanford Univ. on a Fellowship in

1939 when he became ill and entered a hospital. His unfortunate death came Nov. 28, 1941. He was an authority on Northwestern termites. Many persons felt his demise keenly.

JEWETT, STANLEY GORDON (1916 -)

Born Dec. 28, 1916 at Portland, Oregon; Sanitary Inspector, Plague Suppressive Measures, U.S. Public Health Service; B.S. Oregon State College; Ent., Klamath Midge Investigation, 1938; Oregon Fish Commission 1939-1941; U.S. Fish and Wildlife Service, 1941-1942; member of Phi Sigma, A.A.A.S.; interested in Lepidoptera and Plecoptera.

JOHNSON, ORSON BENNETT (1848-1917)¹

Born Aug. 15, 1848 at Williston, Vermont; Pioneer naturalist and former Professor of Biology at the Univ. of Wash.; on his third try and still only fifteen years of age, Johnson succeeded in enlisting in the the Fourth U.S. Infantry and fought at Wilderness, Spottsylvania, North Anna, Harris House, Cold Harbor, and was present at Lee's surrender--real adventures for a Civil War veteran of sixteen summers! Following the Civil War he briefly attended the Classical Academic at Essex, Vermont, and then in 1869 obtained a law degree from Union College in Albany, New York. He never practiced law because he disliked its chicanery and because he was stimulated by Agassiz's

¹ Taken largely from M. H. Hatch's beautifully written and documented manuscript concerning O. B. Johnson. The writer earnestly hopes to expand the biography of O. B. Johnson in event this manuscript can be published.

lectures, he began to turn toward natural history. He came West and arrived in Portland on Sept. 6, 1869. Portland was then a frontier community of about 8000 population and the twenty-one-year-old Johnson found employment as a carpenter, surveyor, and draughtsman. He found his interests increasingly swinging to natural history and gave his first collection to Woods Oregon Museum. He became so interested in insects that he was known as "Bug" Johnson shortly after settling in Salem, Oregon. He contributed articles to the Willamette Farmer, published in Salem, on the Apple tree Bark Louse (June 20, 1874, Jan. 18, 1875) the Apple Tree Caterpillar (June 29, 1874), Insect Destroyers (July 24, 1874), the Fall Webworm (Aug. 8, 1874), Remedy for Ticks (Jan. 15, 1877). Johnson married Mary Purvis on July 1, 1875, at Portland, and the couple were without children until he adopted a son, Clifford E., shortly after coming to Seattle in 1890. Apparently about 1875 Johnson came under the influence of Thomas Condon, Biologist at Pacific University, and later first Professor of Natural History at the Univ. of Oregon. In Dec. 1876 the Oregon School and College Association of Natural History was organized in Portland and Johnson was elected Curator. He settled in Salem in 1877 and the governor allowed him a room in the capitol building as a museum. His emolument was tiny and the collections he assembled were

really his own and accompanied him to Seattle. He continued to make the greater part of his living as a draughtsman and lecturer. In 1882 Johnson got the chance he had been waiting for--a professorship of Natural History at the Univ. of Wash. Professor Johnson was thirty-four when he came to Seattle. In 1892 the catalog listed him as teaching: physiology, botany, zoology, biology, mineralogy, geology, chemistry and natural philosophy! Not a "chair" but a "setee" as President Eliot is said to have remarked during a visit to Seattle. Johnson played a leading role in the Young Naturalists' Society at the University, and most of the entomological collections and books were turned over to him when the society quietly died. Johnson's health began to fail when he developed crippling arthritis sometime prior to 1892. He was unable to obtain relief from medical authorities in the East. He actually taught his last course in 1896. In 1896 he went to Honolulu, his health much worse, presumably to die. However, he returned to Seattle in 1896 to endure a twenty year period of invalidism, and to work constantly with his collection of Lepidoptera and Coleoptera. Though befriended on every hand, Johnson was exceedingly crippled, blind in one eye, had cancer, and unknown to his friends constantly carried a lethal drug, should his sufferings become too great. His wife died

of cancer in 1916 and Johnson followed her on March 9, 1917. The University gave his name to Orson Bennett Johnson Hall, when the building was erected in 1930. Johnson was a great character, a pioneer in biology in the northwest, and established an enthusiasm for natural history in the Seattle area. His students were able and his friends many.

JONES, EDWARD WALLEY (1904 -)

Born Aug. 28, 1904 at Portland, Oregon; Ass't. Ent., BE&PQ, Wireworm Control, Walla Walla, Wash.; attended Reed College B.A. 1927, M.A. Univ. of Minn. 1930; Grad. Ass't. Reed College, 1927-1928; Ent. Ass't. Univ. Minn., 1928-1930; BE&PQ Field Ass't. 1929; Ass't. Ent. 1930-1942; member of Sigma Xi and A.A.E.E.; interested in Coleoptera; three publications.

JONES, SIDNEY CARROLL (1898 -)

Born July 16, 1898 at Canova, South Dakota; Associate Ento., Ore. Ag. Exp. Sta., Corvallis, Oregon; attended Wash. State College, B.S., in Forestry from Oregon State College in 1926; M.S. from Iowa State College in 1928; further graduate work at Cornell Univ. in 1928-1929; Ass't Nursery Inspector, Iowa, 1927; Field Advisor, N.Y. Spray Service, 1928-1930; Ass't and Associate Ent. with Ore. Ag. Exp. Sta. 1930-1942; member of A.A.E.E. and Ore. Ent. Soc.; interested in trypetidae and has a fine private collection; about two publications.

KALOOSTIAN, GEORGE H. (1912 -)

Born January 12, 1912 at Calsarea, Turkey, (Armenian);
Junior Ent., BE&PQ, Pear Psylla Control, Spokane, Wash.;
 attended Fresno State College, B.A. from Univ. of Calif., and
 M.S., from Oregon State College; Inspector, Calif. Dried Fruit
 Assoc., 1935-1937; Field Aide, U.S.D.A. 1938-1940; Junior Ent.
 U.S.D.A. since 1942; member of Fresno Natural Hist. Soc., A.A.
 E.E., Phi Sigma, Sigma Xi, and Gamma Sigma Delta; ten publica-
 tions.

KEEN, FREDERICK PAUL (1890 -)

Born Nov. 20, 1890 at San Diego, California. Senior Ent.
BE&PQ Forest Insects Lab., Portland, Oregon; B.S. Univ. of
 Calif.; Ent. Ranger, BE&PQ 1914-1916; Scientific Ass't. BE&PQ
 1916-1917; Coast Artillery Corps, 2nd Lieut. overseas 1917-
 1919; 1919-1942 with Div. of Forest Insects; member of Soc.
 Am. Foresters, A.A.E.E., (Council Member 1941-1943) Pac.
 Coast Ent. Soc., Fellow of A.A.A.S.; eighteen publications
 an authority on forest insects; amiabee, highly respected
 among northwestern entomologists, and a thorough scholar.
 KENT, ELLIS CLARK (1919 -)

Born May 27, 1919 at Pasadena, California: Senior in
Entomology at Oregon State College graduating 1942; General
 Chem. Co. 1940; Calif. State Dept. Ag. 1941; member of Ent.
 Soc. Am. and Ore. Ent. Soc.; interested in general collecting.

KINCAID, TREVOR CHARLES DIGBY (1872 -)¹

Trevor Charles Digby Kincaid—he long ago allowed the two middle names to pass into oblivion—was born in Peterboro, Ontario, December 21, 1872, the son of Robert and Margaret Kincaid. His father was a physician born in Donegal, Ireland, June 10, 1832, and traced his descent to a lauded Scotch family of the same name. The Kincaids moved to Olympia Washington in 1889. Young Kincaid by 1894 had built up a collection of nearly 60,000 specimens of insects in addition to sending nearly 100,000 to eastern specialists! Many new species were described from this material and his return mail began to be addressed to "Professor" Kincaid. Kincaid soon got in touch with O. B. Johnson of the University and attended a meeting of the Young Naturalists' Society. In the autumn of 1894 Kincaid entered the University of Washington. His father's small fortune had been swept away by the financial crash of 1893, and his own savings of a hundred dollars, had gone to help his mother visit her brother in New York, Kincaid had twelve dollars in his pocket when he set out. One dollar had to be paid for boat fare between Olympia and Seattle. He put away one dollar for the return trip in case his plans did not materialize. Meanwhile O. B. Johnson had prevailed upon

¹ This material is very largely taken from an unpublished manuscript by M. H. Hatch concerning the history of zoology at the Univ. of Wash.

Arthur Denny to aid Kincaid with his room and board. Kincaid expected to be a chore boy and even approached the Denny home by the back door. But on the contrary he was made very welcome and installed as a member of the family. Kincaid had a two unit credit deficiency which he had to make up, but he did so well and took such an enthusiastic part in the Young Naturalists' Society that at the completion of his first year he was appointed as an assistant at twenty-five dollars per month. Since that time he has continued on the staff of the Univ. except for brief leaves of absence. In the summer of 1897 Kincaid accompanied David Starr Jordan to the Pribilof Islands for the Alaska Fur Seal Commission. Jordan was so delighted with the young man that he tried to "steal" him from Wash. Univ. for Stanford. Only prompt action by the Board of Regents doubling his salary to fifty dollars, saved him for Washington. For a few months in 1897, Kincaid served as acting professor of Entomology at the old Oregon Agricultural College. Kincaid gave all the zoological work at the Univ. of Wash. during his senior year, and upon his graduation in 1899 with a B.S. degree, was appointed assistant professor of zoology. From May until August of 1899 he served as entomologist on the Harriman Alaska expedition. Originally conceived of as a big game hunt by Edward Henry Harriman, American railway magnate,

the Alaskan trip was changed to a scientific expedition. The steamship "Geo. W. Elder" was chartered for the purpose and left Seattle with a personnel of 126 persons, including 25 scientists. Between June 3 and July 27 Kincaid collected at 27 points between Lowe Inlet in British Columbia and Popof Island south of the Alaskan Peninsula. About 8000 specimens were taken and later deposited with the National Museum.

In 1901 Kincaid received his M.A. degree and was made professor of zoology. In 1905 he assisted in founding the Marine Station at Friday Harbor. He spent the summer of 1905 at the Bermuda Marine Station and the year 1905-1906 at Harvard University. In 1908-1909, as a representative of the U.S.D.A. Kincaid made trips to Japan and, via St. Petersburg and Moscow, to Bessarabia and Kiev, to investigate and ship back parasites of the gypsy moth. He was also enabled to tour portions of Europe.

Kincaid was a charter member of the Univ. of Wash. Chapters of Sigma Xi and Phi Beta Kappa. He is also a member of Phi Sigma, a Fellow of A.A.A.S., Ent. Soc. Am., A.A.E.E., Pacific Coast Ent. Soc., Ent. Soc. Wash., Ent. Soc. Puget Sound, Ent. Soc. B.C., Am. Soc. Zoologists, Am. Soc. Pchthyologists and Herpetologists, Am. Malacological Soc., and West. Soc. Nat.

In 1917 Kincaid married Louise Farrar Pennell. There are six children. He has published a number of papers and has a wide recognition as an outstanding northwestern naturalist. He has an uncanny memory and has been the inspiration for many persons.

KNIPLING, EDWARD F. (1909 -)

Born Mar. 20, 1909 at Port Lavaca, Texas; Associate Ent. in Charge, Mosquito Control Investigations, BE&PQ, Portland, Oregon; B.S. Texas A & M; M.S. Iowa State College; Junior Ent. U.S.D.A. 1931-1935; Ass't. Ent. 1935-1940; member of A.A.E.E. and Ore. Ent. Soc.; interested in medical entomology and immature stages of Diptera; about twenty publications; recently transferred to Orlando, Florida.

LANCHESTER, HORACE PRESTON (1899 -)

Born Feb. 18, 1899 at Bliss, Idaho; Junior Ent. BE&PQ Wireworm Control, Walla Walla, Wash.; A. B. College of Idaho, M.S. Univ. of Idaho; member of A.A.E.E., interested in wireworms; three publications.

LANDIS, BIRELY J. (1904 -)

Born Feb. 28, 1904 at Greenville, Ohio; Associate Ent. BE&PQ, Wenatchee, Wash.; B.S. Miami Univ. 1927; M.S. Ohio State 1929; Ass't. Ent. 1929, Associate from 1938; member of Phi Sigma, Sigma Xi; A.A.A.S.; Ent. Soc. Am.; A.A.E.E., Ohio Acad. Sci.; several publications.

LANE, MERTON CHESLEIGH (1893 -)

Born Sept. 4, 1893 at Everett, Mass.; Entomologist in Charge, BE&PQ, Wireworm Laboratory, Walla, Walla, Wash.; B.S. Mass. Agric. College, 1915; Sci. Ass't. 1917-1923; Junior Ent. 1923-1924; Ass't. Ent. 1924-1929; Assoc. Ent. 1935; Ent. since 1935--all with U.S.D.A.; member of A.A.A.S., A.A.E.E.; Puget Sound Ent. Soc., Ore. Ent. Soc.; interested in Elateridae; twenty publications.

LARSON, NOAL P. (1912 -)

Born 1912 in Utah; Ass't. Professor of Ent. and Zoology and Ass't. Ent., South Dakota College and Ag. Exp. Sta.; B.S. in 1934 and M.S. in 1936 from Oregon State College; and Ph.D. from Iowa State College in 1941; various assistanships and agent positions for colleges and U.S.D.A.; present position 1938 to date; member of A.A.E.E., Ent. Soc. Am., Phi Sigma.

LATHROP, FRANK H. (1891 -)

Born July 31, 1891 at Orangesburg, South Carolina; Ent. Maine Agric. Exp. Sta., Orono Maine; B.S. Clemson College, 1913, M.S. 1915, Ph.D. 1923 from Ohio State; Ass't. Ent. N.Y. Ag. Exp. Sta. 1915-1916; Ass't. And Assoc. Ent. Ore. Sta. Ag. Exp. Sta. 1917-1922; Fellow, Crop Protection Institute 1922-1923, Assoc. Ent. N. Y. Ag. Exp. Sta. 1923-1924; Prof. of Ent. and Zool. and State Ent., Clemson College 1924-1925; Ent. and

Senior Ent. U.S.D.A. 1925-1934; at Maine since 1934; member of Ent. Soc. Am., A.A.E.E., A.A.A.S., Ent. Soc. Wash., Sigma Xi, Phi Kappa Phi; interested in leafhoppers; many technical papers.

LEECH, HUGH BOSDIN (1910 -)

Born May 10, 1910 at Kamloops, B.C.; Agric. Ass't. Dom. Ent. Lab., Vernon, B.C.; B.S.A. 1933 Univ. of Brit. Col., and M.S. 1938 Univ. of Calif.; Insect Pest Investigator 1930-1938; Graduate Ass't. Grade 1, 1938-1940; Agric. Ass't. Grades 10 and 11, 1940 and 1942; Phi Sigma, Sigma Xi; Ent. Soc. Am., Ent. Soc. B.C.; interested in aquatic Coleoptera; thirty-six publications; possesses the following families from the Chas. V. Lang collection; Hydrophilidae, Gyrinidae, Silphidae, and Staphylinidae (presented the Leiodidae to the Canadian National collection at Ottawa).

LLEWELLYN-JONES, JAMES R. J. (1895 -)

Born in 1895 at Edgeside, Waterfoot, England; Private Collector at Cobble Hill, B.C.; Haileybury College and M.A. Magdalene College, Cambridge, England; Fellow of the Royal Ent. Soc. London, member of Ent. Soc. Am., Ent. Soc. B.C.; interested in Lepidoptera; several publications.

LOVETT, ARTHUR LESTER (1885-1924)

Arthur Lester Lovett, Professor of Entomology, Oregon State College, and Oregon State Entomologist, died at his

home in Corvallis, Oregon, April 25, 1924, of septicaemia poison.

Born at Neal, Kansas, August 23, 1885, he was called from us in the prime of life and at the time he was attaining national recognition as a leader among economic entomologists. Graduated from Oklahoma Agricultural and Mechanical College in 1906, Prof. Lovett acted as Entomologist for that institution and as state inspector until 1911, when he came to the Oregon Agricultural College as Assistant Entomologist. In 1917 he became head of the department of Entomology and State Entomologist for Oregon.

He paid much attention to the Diptera, especially the family Syrphidae, in which group he has described many new species from the west. During the past few years, however, little time was devoted to systematic entomology, but his untiring labor along economic lines brought him wide recognition among the fruit growers and farmers of the Northwest. Prof. Lovett was the first to use spreaders for increasing the efficiency of sprays; this practice is now common throughout the country.

Prof. Lovett was a fellow of the American Association for the Advancement of Science and had been a Vice-President of the American Assoc. of Econ. Entomologists and a member of the Editorial Board of the Annals of the Entomological

Society of America. He was a member of the California Acad. of Science, Pacific Slope Ent. Soc., Western Soc. of Naturalists; Crop Pest Institute of America, the American Crop Pest Commission and of two National Honorary Fraternities, Gamma Sigma Delta and Phi Kappa Phi.¹

MAIL, GEORGE ALLEN (1894 -)

Born Oct. 28, 1894 at Langholm, Dumfriesshire, Scotland; Entomologist in charge, Livestock Insect Lab., Dom. Dept. Sci. Serv., Kamloops, B.C.; B.S. Univ. of Alberta 1925, M.S. Univ. of Minn. 1928; Ass't. Mosquito Investigations, Ent. Dept. Univ. of Alberta 1925-1926; Ass't. Div. Ent. Wireworm Inv. Univ. of Minn. 1927; Ass't. Prof. Ent. Montana State College, 1928-1937; present position since 1927; member of Phi Sigma, Sigma Xi, Phi Kappa Phi, Fellow of A.A.A.S.; A.A.E.E., Ent. Soc. B.C., interested in entomological photography, numerous publications. He finished high school in 1910, acted as bank clerk, tax assessor, canadian soldier (1915-1919) and rancher until he started to Univ. in 1922. Attended 5th International Congress in Ent. in Paris 1932 as delegate from Montana State College; became an American citizen in 1934.

MALKIN, BORYS (1917 -)

Born Nov. 20, 1917, at Witebsk Russia; Special Student

¹Ent. News, Vol. XXXV, July 1924, pp. 263-264.

in Anthrop. and Zoology at U. of Oregon; Univ. of Oregon; Brooklyn Ent. Soc., Oregon Ent. Soc., is interested in Coleoptera, Palearctic and N.A.

MANIS, HUBERT CLYDE (1909 -)

Born July 18, 1909 at Bozeman Montana; Ass't. Ent. and Ass't. Extension Ent. Dept. of Ent. Univ. of Idaho; Montana State College; Kan. State College, Iowa State College; Research Ass't. Dept. Ent. & Zoology Iowa State College 1937-1940; A.A.E.E., Ent. Soc. of Am., Kan. Ent. Soc., Phi Sigma, Sigma Xi, interested in Economic Ent. and entomological illustration.

LEIGHTON, BENJAMIN V. (1918 -)

Born Sept. 13, 1918 at Bremerton, Wash.; Undergrad. Ass't. in Zoo. at the Univ. of Wash.; member of Phi Sigma and Puget Sound Ent. Soc; has been collecting Wash. Lepidoptera for 13 years and has toured practically all parts of the state; is preparing an annotated check-list at present.

MARSHALL, JAMES (1903 -)

Born 1903 at Strathblane Parish, Scotland; Ent. in Charge, Fruit Insect Inv., Dom. Ent. Lab., Vernon, B.C.; attended Univ. of Toronto, Wash. State College, and McGill Univ. and has a Ph.D.; Ass't. Prov. Ent., Ontario, 1925-1928; Ass't. Ent. Dom. Ent. Lab., Annapolis Royal, N.S., 1929-1932; Ent. Wash. Ag. Exp. Sta., Wenatchee, 1932-1938; present position

since 1938; member of A.A.E.E., and Ent. Soc. B.C.; thirty publications.

MASON, JAMES I (1914 -)

Born June 15, 1914 at Ellensburg, Wash.,; Junior Ent. with Pear Psylla Control Bureau of Ent. and Plant Quarantine, U.S.D.A.; Central Wash. Coll. of Educ., 1932-34; Univ. of Wash., 1934-37; State College of Wash., 1937-40; Employed by Pear Psylla Control March 1940; Phi Sigma; Treasurer of State College of Wash. Chapter 1938-39.

MATHERS, WILLIAM GRAHAM (1901 -)

Born Dec. 24, 1901 at Ottawa, Ont. (Canada); Ass't. Dom. Forest Insect Lab., Vernon B.C.; Univ. of Brit. Col. and N. Y. State College of Forestry, Syracuse Univ., Pest Inv. for 6 months 1923, Dom. Dept. of Ag., Ass't. to Ent., Limonera Ranch, Santa Paula, Calif, 1924-25; Pest Investigator, June, 1925-May 1926, Jr. Ent. June 1926-July 1935; Jr. Ent. 1926-1935; Jr. Ent. 1935-1937; Jr. Agric. Sci. 1937-1940; Ass't. Ent. 1940; Canadian Soc. Forest Engineers; Ent. Soc. B.C.

MAYERS, RICHARD JAMES NEVILLE (1908 -)

Born 1908 at Vancouver B.C.; Manager Insecticide and Fungicide Dept Buckerfields Ltd.; Univ. Brit. Col. Plant disease investigator; Dom. Dept. of Ag. 1932-1935; Ent. Soc. B.C.

McKENNON, ROBERT FRANK (1889 -)

Born Sept. 10, 1889 at Berryville, Ark.; Chief, State of Oregon, Division of Plant Ind. and Market Enforcement, Salem Oregon; attended Oregon State College; member of Ore. Ent. Soc.

MOCKRIDGE, GERALDINE EVY (1897 -)

Born Apr. 17, 1897 at Taunton, Somerset, England; High School Science teacher at Semiahmoo; B.S. and M.S. Bristol Univ.; member of Ent. Soc. B.C.; interested in Fraser Valley insects.

MELANDER, AXEL LEONARD (1878 -)

Born June 3, 1878 at Chicago, Ill.; Prof. of Biol. and Chair. of Dept. of Biol. City College of N.Y.; Univ. of Texas; Chi. Univ. Harvard; Instructor Ent. and Ass't. Ent. Wash. Ag. Coll. 1904-1906; Prof. of Ent. and Ent. Wash. State Coll, 1906-1926; Prof. Biol. and Head Dept. City Coll. of N. Y., 1926; Fellow: Ent. Soc. Am. (Pres. 1939), A.A.A.S., Am. Acad. Arts & Sco., N. Y. Acad. Sci; Member: N.Y.Ent.Sco. (Pres. 1934) Wash. Ent. Soc., Cambridge Ent. Club, Brooklyn Ent. Soc. Has the largest private collection of Diptera.

MENZIES, THOMAS PHILLIP OXENHAM

Born at Croydon, Surrey, England; Curator, City Museum of Vancouver, B.C.; schooled at Whitzift, Croydon and H.M.S. Training Ship Worcester; Fellow of Royal Anthro. Inst. London, Art Historical and Sci. Inst. and Ent. Soc. B.C.

MORGAN, CECIL VERNON GEORGE (1916 -)

Born Feb. 24, 1916 at New Westminster, B.C.; Student Ass't. at McDonald College in McGill Univ.; B.S.A. Univ. of Brit. Col. in 1938; Ass't. Forest Insects Lab. Dom. Agric. Dept. Vernon B.C. 1937-1941; Member of Ent. Soc. B.C.; interested in forest entomology.

MORRISON, HUGH ENGLE (1905 -)

Born Mar. 2, 1905 at Bainbridge, Penn.; Ass't. Ent. Ore. Ag. Exp. Sta., Corvallis; B.S. Franklin and Marshall College 1927; M.S. Ohio State Univ. 1935; Ass't. Ent. Ohio Agric. Exp. Sta. 1932-1935; present position since 1937; member of A.A.E.E., and Ore. Ent. Soc.; interested in economic entomology.

MOTE, DON CARLOS (1887 -)

Born January 13, 1887 in Greenville, Ohio, son of a businessman. He attended Greenville grammar and high school and was a member of the Audubon Society there. As a boy he drove cattle for a buyer, worked in a barrel heading factory, and in the market garden. He then decided in favor of college and returned to high school to make up a Latin deficiency for college entrance examinations.

Dr. Mote started to the University of Michigan in 1906 but left after one year and entered Ohio State University to specialize in Agriculture. Professor Herbert Osborn was a

great influence upon the young man. Mote took a fancy to animal husbandry and took all the work offered, and all of the elective work offered in zoology and entomology as well. Thus he had an extremely wide and varied background as an undergraduate. While at Ohio State, he lived in the Alpha Gamma Rho, national professional agricultural and forestry fraternity. He ran a market garden, dropped out a half year and worked in the Soils Department, and finally graduated in 1911. In 1912, working under Professor Osborn, he received his master's degree, writing on the Life History of Drosophila.

The Chief of the Animal Husbandry Division of the Ohio State Experiment Station was looking for a parasitologist. Mote was recommended because of his wide background. He occupied this position from 1912-1919 except for one year spent as a vocational agricultural teacher in the University High School. In June 1914 he married Josephine Mower of Wooster. A son, Richard Hodges, was born in 1916.

Mote resigned as Parasitologist and acted as State Entomologist for Arizona from 1919 to 1923. He came to Oregon State College in 1923 as Associate Entomologist and Associate Professor. In 1924 he was appointed Acting Head and was made Professor and Head in 1925. He returned to Ohio State on a leave of absence and obtained his Ph.D. in 1928.

Mote, at Oregon State, has trained a number of graduate students--all of whom are placed--has added courses, expanded facilities, doubled the staff, and reorganized the Department of Entomology to a major degree department.

Dr. Mote, or "Prof" as he is known, is a member of Sigma Xi, Phi Kappa Phi, Gamma Sigma Delta, A.A.A.S., Ent. Soc. Am., A.A.E.E., and Oregon Ent. Soc. He has an enviable record as an economic entomologist and administrator. He has published numerous papers.

MOWRY, PAUL (1919 -)

Born March 20, 1919 at Sarles, N.D.; Field Ass't. in Ent. Ore. Ag. Exp. Sta.; Corvallis, Oregon; B.S. Oregon State Coll., 1942; Field Ass't. in Ent. at Oregon State College, 1937-1942; member of Ore. Ent. Soc.; interested in Diptera.

NAGEL, ROY HEINRICH (1900 -)

Born Apr. 9, 1900 at Joliet, Illinois; Assoc. Ent., Div. Forest Insect Inv., BE&PQ, Coeur d'Alene, Idaho; served six years in Marine Corps, returned and finished high school; B.A. and M.S. Univ. of Minn.; member of Sigma Xi, Ent. Soc. Am., Ent. Soc. Wash., Soc. Am. Foresters; interested in entomological photography; "have several published papers, but insufficient to make their listing impressive to me."

NAIL, JACK R. (1917 -)

Born Oct. 4, 1917 at Walla Walla, Wash.; Field Representative, Southern Oregon Sales Co.; B.S. Wash. State College, grad. work at Iowa State and O.S.C.; Ent. for Sherwin-Williams Co. 1937-42; member of Phi Beta Kappa, Phi Kappa Phi, Phi Sigma, Ore. Ent. Soc.

NELSON, RUSSELL WINTERS (1913 -)

Born May 2, 1913 at La Grande, Oregon; Agent, BE&PQ, Pear Psylla Control, Spokane, Wash.; B.A. Whitman College and M.S. Wash. State College; Fellow in Zoology at W.S.C. 1937-38; Agent, U.S.D.A. 1938-42; interested in ent. photog.

NEWCOMER, ERVAL JACKSON (1890 -)

Born in 1890 at Oregon, Illinois; Senior Ent. BE&PQ, Wenatchee; B.A. Stanford Univ. 1911; Ass't. State Insectary, Calif. Comm. Hort. 1912; Instructor, Stanford U. 1913-14; Scientific Ass't., Assoc. Ent., Entomologist, and Senior Ent. with U.S.D.A. since 1914; member of Sigma Xi and Phi Beta Kappa; has published approximately fifty papers.

NICHOLSON, RUSSEL ALBERT (1910 -)

Born June 7, 1910 at Ballinger, Texas; Student at Oregon State College 1941-1942; Quarantine Agent, Pink Boll Worm Control, BE&PQ, 1938-42; attended Randolph Junior College, Texas, and O.S.C., member of Ore. Ent. Soc.; interested in economic insects.

O'NEILL, WILLIAM JOHN (1900 -)

Born Dec. 4, 1900 at Redhouse, West Virginia; Ass't. Ent.
at Fruit Tree Branch Exp. Sta., Wenatchee, Wash.; B.S. and
M.S. Ohio State Univ.; Research Ass't. N. J. Agric. Exp. Sta.
1934-1940; member of A.A.E.E., Ent. Soc. Am., Sigma Xi; three
publications.

OSTLIND, HERBERT JOHN (1918 -)

Born Sept. 13, 1918 at Terry, Montana; Field Ass't. Ore.
Ag. Exp. Sta., Corvallis; B.S. Oregon State College 1941;
Field Ass't. U.S. For. Serv. Pine Beetle Surv. 1937-40; mem-
ber of Ore. Ent. Soc.; interested in forest insects.

POOLE, JOHN BURTON (1914 -)

Born Feb. 14, 1914 at Vancouver, B.C.; Research Ass't.
Instit. of Parasitology, McGill Univ. Montreal, B.A. Univ.
Brit. Col.; M.S. McGill Univ.; Chief of Field Surv. Dept.
Nat'l. Health; Plague and Rocky Mt. Spotted Fever Surv. in
B.C., 1938-40; member of Ent. Soc. B.C., interested in medical
and veterinary entomology.

POST, RICHARD LEWIS (1910 -)

Born July 31, 1910 at North Greece, New York; technician
and Curator, Dept. of Ent., Oreg. State College, Corvallis;
B.S. Michigan State College; has three years of graduate work
at O.S.C. and one year of graduate work at Rochester Univ.;
Ass't. Ent. 1932-1933, and Head of Dept. of Frank A. Ward

Foundation of Natural Science 1933-39; member of A.A.E.E., Rochester Acad. Sci; Nat'l Pest Control Assoc.; Ent. Soc. Ontario, Ent. Soc. Am. Ore. Ent. Soc., Gamma Sigma Delta; privately interested in rare and showy specimens; has two publications and a number of articles in Ward's Bulletin of which he acted as editor 1933-1939; was an amateur boxer in college and has a very wide acquaintance with entomologists as a result of his work at Wards. His enthusiasm has been largely responsible for the foundation and continued activity of the Oregon Entomological Society, of which he has been the Secretary since its inception. He is an excellent taxonomist and must be given credit for the present high standing of the Departmental collection and the student reference collection.

PRATT, ROBERT Y. (1915 -)

Born Oct. 30, 1915 at Portland, Oregon; Farmer at Coupeville, Wash.; B.S. from Univ. of Washington, 1937; member of Phi Sigma; Puget Sound Ent. Soc., Scarab Society, A.A.A.S., generally interested in northwestern Coleoptera; five small publications.

PRESCOTT, HUBERT WILLIAM (1899 -)

Born Feb. 7, 1899 at Jewell, Oregon; Agent, P-I, BE&PQ, Pear Psylla Control, Spokane, Wash.; B.S. Univ. of Oregon in

1924 and has done graduate work at Oregon State College; Curator and Collector for Univ. of Ore. Museums and Zoology Dept. 1920-1921; was in the U. S. Merchant Marine and acted as Petty Officer on the old Leviathan and there are few large ports he has not visited. He was a collector of marine specimens on W. K. Vanderbilt's yacht "Ara" on a voyage around the world in 1928. He is a member of the A.A.E.E. and Ore. Ent. Soc; he is interested in insect behavior and termites; he is an essayist and scholar, a block of tough man looking far less than his age, an ardent collector and archer.

RASMUSSEN, WILLIAM BENJAMIN (1918 -)

Born May 11, 1918 at Yakima, Wash.; Graduate Student in Ent. at Oregon State College; attended Yakima Junior College and has a B.S. from Univ. of Wash., 1941; member of Ore. Ent. Soc.

REGAN, WILLIAM SWIFT (1886 -)

Born Aug. 21, 1886 at Williamsburg, Mass.; Technical Advisor to Northwest area for Calif. Spray and Chem. Corp. since 1925; B.S. 1908 and Ph.D. 1915 from Mass. State Coll.; Chief Deputy Nursery Inspect. Mass. 1909; Ass't. Prof. in Ent. 1915-18, and Assoc. Prof. 1918-21; Ass't. Prof. Montana State College, 1922-23; member of A.A.A.S. and A.A.E.E., numerous articles.

RICE, HAROLD EDWARD (1917 -)

Born June 21, 1917 at Eugene, Ore.; Eugene Farmer; Member of Ore. Ent. Soc.; collects Australian and New Zealand Lepidoptera.

RICE, PAUL LAVERNE (1906 -)

Born Dec. 28, 1906 at Bancroft, Nebraska; Head, Biol. Dept. Alma College, Michigan; B. S. and M.S. Univ. of Idaho and Ph.D. Ohio State Univ.; Inst. in Ent. and Ass't. Ent. Idaho Ag. Exp. Sta. 1931-33; Ass't. Ent. in Exp.Sta. and Extension, Univ. of Delaware 1936-1937; present position since 1937; member of Sigma Xi; eleven publications.

RIEDER, ROBERT E. (1912 -)

Born Nov. 9, 1912 at Portland, Oregon; Acting County Agent Salem, Ore.; Attended Linfield College and has a B.S. from O.S.C.; Field Ass't. and Ass't. in Ent. at Oreg. State 1936-37; Inst. in Ore. Ext. Serv. 1938-1942; Ass't. Prof. 1942 (country agents are on the state college staff with courtesy rank corresponding to position); member of Phi Sigma and Ore. Ent. Soc.; collects muscidae.

RITCHIE, CALVIN LESLIE (1907 -)

Born Sept 30, 1907 at Burleson, Texas; Insp. in charge, Div. of Foreign Plant Quarantine, BE&PQ, Portland, Ore.; B.S. Texas Tech. College, Lubbock, Texas; Agent 1929-30;

Inspector 1930-42 with U.S.D.A.; member of A.A.E.E., Ent. Soc. Am., A.A.A.S., Am. Phytopathological Soc., Puget Sound Ent. Soc., Ore. Ent. Soc., Gamma Sigma Delta, Phi Sigma, Phi Kappa Phi; interested in Lepidopterous larvae; has made an enviable scholastic record in graduate work at Oregon State College and is highly thought of by his superiors and friends.

ROCKWOOD, LAWRENCE PECK (1886 -)

Born Oct. 13, 1886 at Waterbury, Conn.; Ent. in charge, BE&PQ, Cereal and Forage Insect Field Sta., Forest Grove, Oregon; B.S. Mass. Agric. College; Scientific Ass't. 1912-23, Assoc. Ent. 1924-29, Ent. since 1929, all with U.S.D.A.; in present post since 1915; Fellow A.A.A.S., A.A.E.E., Ent. Soc. Am. Ent. Soc. Wash., Ent. Soc. Ore.; sixteen publications; interested in economic entomology; a recorder and writer of scholarly articles.

ROSENSTEIL, ROBERT G. (1910 -)

Born Apr. 8, 1910 at Portland, Oregon; Ass't. Ent. Ore. Ag. Exp. Sta., Corvallis, B.S. and M.S. from O.S.C. and further graduate work at Univ. of Calif. and Iowa State College; Research Fellow, O.S.C. 1937-1939; Field Ass't. and Project leader with Exp. Sta. since that date; member of Sigma Xi, Phi Sigma, A.A.E.E., Ore. Ent. Soc., Gamma Sigma Delta; one publication.

RUHMANN, MAX HERMANN (1880 -)

Born Sept. 9, 1880 at Itzehoe, Holstein, Germany; Prov. Ent., Vernon, B.C.; schooled at Claremont House, Kent, Eng., Harcourt in Dublin, and Trinity College in Dublin Ireland; 1900-1902 with Imperial Army in South Africa, returned with health impaired by malaria contracted in Africa. He abandoned medicine studies and with the hope of coming to Canada to raise fruit he availed himself of the invitation to study at the Irish Botanical Gardens at Glasnevin. He married in 1904 and after a severe attack of malaria, left for British Col. in 1907. He arrived in Calgary in August of 1907 accompanied by his wife and eighteen months old son and was met by his parents who had previously emigrated.. He spent the period of 1907-1912 working on fruit ranches in British Columbia and first recorded the codling moth at Armstrong. He was surprised and delighted to be offered a post as Inspector of Fruit Pests and joined the Departmental staff in August, 1912. In 1914 he applied for and received the post of Ass't. Ent. and Pathologist at the Vernon Laboratories on six months probation. He assumed his new duties on May 1, 1914. In 1918 Pathology and Entomology were divided into separate branches and J. W. Eastham moved the Pathological Lab. to Vancouver, and Ruhmann remained at Vernon as Ass't. Ent. in charge. In 1935 his title was changed to Prov. Ent.

SCHEFFER, VICTOR BLANCHARD (1906 -)

B.S., 1930, M.S. 1932, Ph.D. 1936, all from Univ. of Wash.; assisted in zool. 1930-1936; as a ranger naturalist at Mt. Rainier National Park he wrote many popular notes on insects; now with U. S. Biol. Survey.

SCHUH, JOSEPH (1910 -)

Born March 19, 1910 at Carlton, Ore.; Ass't. Ent. Ore. Ag. Exp. Sta.; B.S. and M.S. Oregon State College; with Ore. Ag. Exp. Sta. since 1936; member of Ent. Soc. Am., A.A.E.E., Ore. Ent. Soc., interested in Odonata and has written an excellent thesis on this subject.

SCOTT, ROGER W. (1914 -)

Born Sept. 4, 1914 at Etiwanda, Calif.; B.S. Oregon State College; Ore. Ag. Exp. Sta. 1937-40; A.A.A. Ent. 1941; Member of A.A.E.E., and Ore. Ent. Soc.; interested in Coleoptera; selfstyled at present as "Buck Private, U.S. Army Medical Corps."

SCULLEN, HERMAN AUSTIN (1887 -)

Born Nov. 27, 1887 at Pierce County, Wisconsin; Assoc. Professor of Entomology at Oregon State College; Dr. Scullen lived on a Wisconsin farm until he was 13. His family moved to Oregon in 1901 and finally settled at Ashland. In the Fall of 1903, Scullen entered Normal School, and came under the influence of Clyde A. Payne, teacher there. Scullen had to

work his way through school chiefly by means of weeding gardens at ten cents per hour. He became interested in entomology about 1906 and upon going to the Univ. of Oregon took up pre-medics. Scullen earned his way through the Univ. by working in logging camps, driving logs down the Willamette River, working in a sawmill and as a carpenter. He graduated with the B.A. degree from Oregon in 1910. The following fall he was engaged as Principal of Junction city high school and in addition to his administrative duties, taught full classes, and coached all athletics--all for \$675 per year. In the summer of 1911, Scullen married Joanne Marie Fredrickson and attended the Marine Biological Station at Friday Harbor, Washington. He continued at the high school until 1912. At that time he departed for Ames, Iowa, to act as Instructor in Zoology and Premedics. He took up work in beekeeping and entomology at Iowa State College and remained there from 1912-1918 rising in rank successively from Instructor to Ass't. Prof. to Assoc. Professor. A daughter, Ruby Mae, was born to the Scullen's in 1916. The first World War found Scullen selected by the government as a Special Field Agent, touring the States of Oregon, Washington, Idaho, and Montana, and was instructing in beekeeping for the years of 1918-1920. Scullen was employed as a half time instructor in Beekeeping in the Soldier's Rehabilitation program at Oregon State College during the fall

of 1920. By Xmas the classes had expanded to the extent that he was employed full time with the rank of Instructor. In 1922 his rank was raised to Assistant Professor. In the summer of 1926 he attended the Coos Bay Marine Station and received a Master of Arts degree from the Univ. of Oregon in 1927. The following summer, 1928, he began Ph.D. work at Cornell Univ. and attended the International Congress on Entomology at Ithaca. In 1929 he was raised to the rank of Assoc. Professor at Oregon State College, and in the summer of 1930 he acted as Ranger Naturalist at Crater Lake National Park. He continued his work for a doctor's degree by shifting to Iowa State College during the summer of 1931. He again traveled to Ames in the summer of 1933 and remained until Christmas while on sabbatical leave from Oregon State College and received his Doctor of Philosophy degree from Iowa State College in 1934. Scullen is a member of: Gamma Sigma Delta, Sigma Xi, A.A.E.E., Pac. Coast Ent. Soc., Ore. Ent. Soc., and a Fellow of the Ent. Soc. of Am. He has published twenty-six papers, is an authority on beekeeping and American authority on *Eucerceris* (Hymenoptera, Sphecidae). Dr. Scullen has recently completed twenty-eight years work with the Boy Scouts of America, has been through all the Chairs of the Blue Lodge, is a thirty-second Degree Mason, and a member of the Shrine. In addition, he acted for

three years as State Chairman for Congregational Laymen's work. He was Secretary-Treasurer for five years and later President of the Pacific Slope Branch of the American Association of Economic Entomologists, and national Vice-President of the same organization. Scullen's enviable achievements are known to many. Always amiable and cheerful, he is a source of inspiration to the students who look to him for guidance. He is an ardent collector and many a student has puffing, half way up a hill, to despairingly see Scullen's sturdy little legs go twinkling on over the top.

SMITH, LAUREL G. (1908 -)

Born July 18, 1908 at Seattle, Wash.; Extension Ent. Wash. State College.; Pullman; attended the Univ. of Wash. and Wash. State College and has B.S. and M.S. degrees; grade and high school teacher at Aberdeen, Washington, 1928-1935; Entomologist for Sherwin-Williams Co., Yakima 1937-1938; present position since 1938; member of Sigma Xi, Phi Sigma, A.A.E.E.; has published five papers and has a fine reputation among the Washington growers.

SPENCER, GEORGE JOHNSTON (1888 -)

Born in 1888 at Yercaud, South India; Assoc. Prof. Zoology and Ent., Univ. of Brit. Columbia; attended Bishop Cotton's school at Bangalore, Regents Polytechnic in London, Victoria Univ. in Manchester, graduate work at Illinois, Cornell and

Toronto Universities; B.S.A. Toronto and M.S. Illinois; Demonstrator at Ont. Ag. Coll. 1912-1913, Ass't. and Lecturer 1914-16; 1916-19 Capt. 186 Bn. C.E.F., in France and Germany; Lecturer 1919-23 at Ontario; Ass't. Prof. at Univ. of Brit. Columbia 1924-35; present position since 1935; member of Ent. Soc. Am., Ontario Ent. Soc., Ent. Soc. of B.C., Pacific Coast Ent. Soc., A.A.E.E., Ecological Soc., Canad. Soc. Tech. Agric., Sigma Xi, Ottawa Field Nat. Club; interested in Anoplura etc.; has published a large number of papers. Prof. Spencer is an extremely able lecturer and the hospitality of the Spencer's is without a peer.

SPULER, ANTHONY (1889-1932)¹

Born Dec. 19, 1889 at Genessee, Idaho; B.S. Wash. State College, 1917, M.S. at same institution in 1919; Ass't. Ent. Wash. Ag. Exp. Sta.; drowned accidentally with wife in Lake Wenatchee in 1932; high reputation among horticulturalists; Phi Kappa Phi, Sigma Xi.

STAGE, HARRY HUTCHINSON (1894 -)

Born May 1, 1894 at Crittenden, New York; Senior Ent. BE&PQ and Ass't. Chief Div. Insects Affecting Man and Animals, Washington, D. C.; B.S. and M.S. 1916-17 at Syracuse Univ.; U.S. Navy 1917-19; Scientific Ass't. 1919-20 with U.S.D.A.;

¹ Webster, R., Anthony Spuler, Jour. Econ. Ent. Vol. 25, Aug. 1932, pp. 939-941.

Ent. with St. Louis and Southwestern R.R. 1920-30; toured Europe in 1930; 1931 with U.S.D.A. to present; formerly with Mosquito Inv. Lab. in Portland; member of Phi Kappa Phi, Sigma Xi, Ent. Soc. Wash., A.A.E.E., Ent. Soc. B.C., Ore. Ent. Soc. Puget Sound Ent. Soc., Nat'l Malaria Committee, Eastern Assoc. Mosquito Control Workers; is interested in medical entomology and has done top northwestern work in this field, 21 publications.

STARKER, CHARLES HAMMOND (1917 -)

Born Jan. 3, 1917 at Jennings Lodge Oregon; Private, Quartermaster Corps, U.S. Army; B.S. in Entomology 1941 from O.S.C.; Lab. technician at Portland Earwig Parasite Lab. 1938-1939; Field ass't. O.S.C. Ag. Ex. Sta. 1940-41; Grad. Ass't. in Ent. O.S.C. Sept. to Dec. 1941; Ore. Ent. Soc., A.A.E.E.; Biological Control, technique in mounting, family Tachinidae, Asilidae.

SWISHER, ELY MARTIN (1915 -)

Born Sept. 29, 1915 at Bozeman Montana; Grad. Ass't. Dept. of Zool. and Ent., Ohio State Univ., Columbus, O.; M.S. Oregon State College 1941 and B.A. Willamette Univ.; Agent Sp. 6, U.S. Dept. of Agric., Bureau of Ent. and Plant Quarantine, Grasshopper and Mormon Cricket Control, Bozeman, Montana. March-Oct. 1938-39; April-Aug. 1940, March-Sept, '41.

Pear Psylla Control, Spokane Washington Aug.-Sept. 1940; Grad. Ass't. Ohio State Univ. Oct. - March 1940-41, 1941-42; Sigma Xi; has a collection of acarina and orthoptera.

TOUZEAU, WALTER DAVID (1912 -)

Born Aug. 19, 1912 at Vancouver, B.C.; Inspector Plant Diseases and Seed Potato Certification; Univ. of British Col; Ent. Soc. B.C. and Phytopathological Soc.; has a collection of aphids on B.C. Certified Seed Potato Crops.

TREHERNE, REGINALD CHARLES (1886 - 1924)¹

Born on March 24, 1886 at Aldershot, England; Former Ent. In Charge for British Columbia; Dom. Agric. Dept.; received early schooling at St. Christopher's in East Bourne and Wellington College in Berkshire. He came to Canada in the spring of 1905 and graduated with a B.S. degree from Ontario Agric. College in 1909. He was employed in entomological investigations by Louisiana State College during the summer of 1908 and engaged in Nursery inspection work for Ontario during the summer of 1909. In the same year he was appointed field officer in the Dom. Ent. Service and served until 1911 in New Brunswick and Ontario. That year he was transferred to B.C. and remained until 1922. In 1915 his title was changed from Field Officer to Entomologist. He lectured at U.B.C. in 1921 and 1922. His work in B.C. was outstanding and paved the way

¹ Dean, G.A. et al. Jour. Econ. Ent. Vol. 17, 1924, pp. 506-508.

for his appointment in 1922 and transfer to Ottawa as Chief of the Division of Field Crop and Garden Insects. His early and unfortunate death occurred on June 7, 1924, of acute peritonitis. He was a member of A.A.E.E., Ent. Soc. Am, Ent. Soc. Ontario, Assoc. Econ. Biol., Fellow of Ent. Soc. of London, and Ent. Soc. B.C. His name appeared on 66 publications.

VEAZIE, MARGARET G. A. (Mrs.)

Born in Chicago and self styled as a "homemaker"; B.S. from Univ. of Wash. and M.A. from Univ. of Oregon; former northwestern school teacher; interested in northwestern Lepidoptera.

VERTREES, JUNIUS DANIEL (1915 -)

Born June 23, 1915 at Lakeside Calif., Salesman and field service in Agr. chemicals for Van Waters and Rogers, Portland; Modesto Junior College and Oregon State College; worked for Ent. Dept. Exp Sta. 1937-41 (O.S.C.), Fellowship from Dow Chem. Co. 1940-41, Ore. Ent. Soc., and Am. Soc. Econ. Ent.

WADDELL, DAVID BRYSON (1916 -)

Born June 29, 1916 at Sooke, B.C., Chemist, Defense Ind. Ltd., Winnipeg; attended Victoria College and has a B.S. and M.A. from Univ. of Brit. Col. 1942; student ass't in ent. at Vernon B.C., Dom. Agric. Lab. and Ag. Ass't. there in 1940; member of Ent. Soc. B.C., and Canadian Soc. of Tech. Agric.; interested in entomological photography.

WAKELAND, CLAUDE (1888 -)

Born Aug. 2, 1888 at La Jara, Colorado; Chief, Div. of Grasshopper Control, BE&PQ, Wash. D.C.; B.S. 1914, M.S. 1924 Colorado State College; Ph.D. Ohio State 1934; Ass't. Ent. Colorado Exp. Sta 1917-20; Ext. Ent. Idaho Ag. Exp. Sta. 1920-1922; Exp. Sta. Ent. 1922-28; Ent. and Prof. 1928-38; Project Leader, Mormon Cricket Control BE&PQ 1938-39; Field Director, Grasshopper and Mor. Cr. Con. BE&PQ 1939-40, Project Leader 1940-42, and Chief of Division; member of Sigma Xi, Gamma Sigma Delta, Ent. Soc. Am. A.A.E.E., A.A.A.S; 35 publications.

WASHBURN, FREDERICK LEONARD (1860 - 1927)

Born on April 12, 1860 at Brookline, Mass.; Former Prof. and Ent. at O.S.C.; B.A. Harvard 1882, and after some grad. work at Johns Hopkins Univ. he again attended Harvard and received an A.M. degree in 1895. From 1887 to 1888 he was an instructor in zoology at the Univ. of Mich, and married Frances Wilcox of Minn. in 1887. He was prof. of zool. and sta. ent. at the old Oreg. Agric. college between 1888 and 1894, and afterwards served at the Univ. of Oreg. and the Univ. of Minn. He died Oct. 15, 1917 of a combined attack of influenza and pneumonia. Washburn was an artist of ability and the first entomologist in this country to describe and draw the egg of the codling moth. He also traveled in the South Sea Islands, painting and collecting insects. He was a member of A.A.A.S.,

A.A.E.E. and its president in 1911, the Ent. Soc. Am. and American Soc. Naturalists.

WARD, IVOR JESMOND (1908 -)

Born 1908 in Reading, England; Agric. Ass't. Dom. Ent. Lab., Kamloops, B.C.; Univ. of Alberta 1934-39; Dom. Ent. Lab., Lab. Ass't. 1926-29; Vernon B.C., Insect Pest Inv. 1930-38, Agric. Ass't. 1939--Kamloops, B.C.; Ent. Soc. of B.C., has published five bulletins.

WEBSTER, ROBERT LORENZO (1885 -)

Born Oct. 4, 1885 at Lafayette, Indiana; Prof. and Ent. Wash. State College Ag. Exp. Sta., Pullman; A.B. 1908 Univ. of Illinois and Ph.D. Cornell Univ. 1921; Prof. and Ent, at N. Dak. Ag. Exp. Sta. 1921-26; present position since 1926; member of A.A.E.E., Wash. Ent. Soc., A.A.A.S., charter member and fellow of Ent. Soc. Am.; a considerable number of publications; one of the northwest's finest economic entomologists. He has a wide circle of friends and is known affectionately as "Doc" to a good many people.

WELLS, MARJORIE ETHEL (1906 -)¹

B.S. 1928, M.S. 1930; Univ. of Wash. Assisted in Zool. 1928-1930; Trichoptera.

¹ From an unpublished manuscript of M. H. Hatch.

WHITNEY, RUTH COOPER (1882 -)

Born at Forest Grove, Oregon Nov. 10, 1882; a Portland writer of nature stories for boys and girls and is the author of a book "Six Feet" concerning insects; interested in foreign Lepidoptera; member of the Ore. Ent. Soc.

WHITWELL, WALTER MONTEITH (1917 -)

Born Nov. 16 1917 at Houston, Texas; Ass't. in Pomology at Cornell Univ.; Oreg. State College and Cornell, M.S. Oregon State 1941 and Ph.D. candidate at Cornell; Field ass't. and student in entomology at O.S.C. from 1936-41, ass't. in Pomology at Cornell since Oct. 1, 1941, Phi Sigma, Econ. entomology with special reference to insect pests of our common tree and small fruits.

WIEMAN, JOHN SAMUEL (1895 -)

Born Nov. 8, 1895 at Los Angeles, Calif.; Supt. of Nursery Service, Dept of Agr. Oregon; U. of Calif., Davis, and Oreg. State College, Corvallis; Swift and Co. Experimental fertilizers 1924-1930; and Dept. of Agric. (pest work) 1930 to date.

WILSON, HARLEY FROST (1883 -)

Born April 14, 1883 at Del Norte, Colo., Prof. of Econ. Ent. at Univ. of Wis; Colo. State College, Univ. of Ill., 1907-08; Oreg. State 1911-13, M.S. 1913 Oregon State College; U.S.D.A.

Bureau of Entomology and Plant Quarantine 1908-1910, Ent.
Ore. State College and Exp. Sta. 1910-1915; Prof. of Econ.
Ent. and Chair. of the Dept. Univ. of Wis. 1915-1942; A.A.A.S.,
Soc. of Econ. Ent., Ent. Soc. Am., Sigma Xi, Improvement of
present insecticides and the new development of methods of
insect control.

WOODS, ERVIN EUGENE (1919 -)

Born Feb. 2, 1919 at Waterman, Illinois; Grad. Student
at Oregon State College; Northern Illinois State Teachers
College; taught at a rural school in Waterman Ill. and was
lab. ass't. at Northern Illinois State Teachers college 1939-
1940. Ore. Ent. Soc.

WOODWORTH, CHARLES EDWARD (1897 -)

Born Sept. 25, 1897 at Berkeley California; Assoc. Ent.
U.S. Dept. of Agric., B.S. from U. of Calif. 1922, M.S.
Univ. of Calif. 1923 and Ph.D. Univ. of Wis. 1930; Instructor
and Head of Dept. of Biology Modesto Jr. College 1924-28;
Ass't. in Ent. Univ. of Wis. 1928-30; Assoc. Ent. U. S. Dept.
of Agric. 1930; Sigma Xi; Phi Sigma, A.A.E.E., A.A.A.S.,
Puget Sound Ent. Soc.; has ten publications.

YANCEY, ROBERT MAXWELL (1919 -)

Born Oct. 22, 1919 at Wilsall, Montana; Senior at O.S.C.
San Jose State (Calif) 1937-41, Stanford 1941; Ore. Ent.
Soc.; interested in Economics and aquatic insects, has made
collecting trips in central Calif. and southern Oregon.

YATES, WILLARD WILSON (1888 -)

Born July 16, 1888 at Juneau, Wis.; Ass't. Ent. BE&PQ, Mosquito Inv. Lab., Portland, Oregon; B.S. 1921, M.S. 1932 Oregon State College; Chemist Nat'l Chem.Co. of Calif. 1926-1931; with U.S.D.A. since 1931; member of A.A.E.E.; interested in pest control; twelve publications.

YOTHERS, MERRILL ARTHUR (1883 -)

Born Dec. 18, 1883 at Ashton, Lee County, Illinois; Assoc. Ent. BE&PQ, Yakima, Wash.; B.S. Univ. of Idaho, 1907, M.S. Wash. State College 1914; Ass't. in Ent. at Mich. State 1908-1910; Ass't. Ent. Wash. State College and Agric. Exp. Sta., 1910-1917; joined Bureau of Ent. as a specialist in Apple Insect Inv. at Medford, Oregon, 1917, and continued until 1922; shifted in 1922 to Yakima as Assoc. Ent. and remained until 1929 when he was stationed at Wenatchee; in 1935 he was again sent to Yakima; member of A.A.E.E., A.A.A.S.; interested in membracidae; did some pioneer work with codling moth life history and susceptibility; sixty-four publications.

Apologia Bibliographica

As the reader may have surmised, it was necessary in part at least to reconstruct certain essentials in the foregoing manuscript. Books have been few and even articles have been sparse and hard to find. Still it is hoped that a reasonably accurate, if somewhat sketchy account, has been rendered of some of the factors in the development of north-western entomology. Most of the manuscript has been based upon the personal correspondence of the author who, to paraphrase of Robinson, "intuits that the apocrypha of history may be truer than the canon."

The bibliography is selective, annotated where the writer felt competent to do so, and constitutes only the important items that the writer was able to glean from hundreds of publications. And in order to make full oblation these are indicated below:

Anderson, J.B. "Typhoid Fever Epidemic at Loon Lake." Thirteenth Biennial Rept. U.S.D.A., 1919.

Annual Reports, Agricultural Experiment Station of Idaho.
(1893-1938)

Annual Reports of the Oregon Agricultural College and Experiment Station. (1898-1938.)

Baker, W. A., "The History and Present Status of Entomology in the Universities and Colleges of Canada." Sixtieth Annual Report. Ent. Soc. Ontario. Pp. 33-37. 1929.

Baker, W. W., "Tyroglyphus siro in Washington." Insect Pest Survey Report No. 11, pg. 568. 1931.

Biennial Crop Pest and Horticultural Report of Oregon Agric. Exp. Stas. for 1911-1912.

Biennial Reports of Oregon State College. (-1940.)

Biennial Reports of the University of Idaho. (-1940.)

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Biographies of Noted Entomologists. This is an anonymous mimeographed 150 page compilation by members of the Entomological Seminar of Ohio State University in 1930. Members were assigned the names of various entomologists and gathered material from journals. It is well written and documented and rare. Presumably only a few copies were run off and the one this writer consulted is in the possession of H. E. Morrison. It contains little information relative to the northwest.

Bonnell, D. E., Personal Correspondence and Manuscript. 1936-1942. This paper was based largely upon the above material. All letters, manuscripts and drafts are stored in the vault of the Department of Entomology at Oregon State College.

Bulletins of the University of Washington State Museum Series. Bull. 1, 1910. 10 pp.

Catalogues of the University of British Columbia. (1919-1941.)

Catalogues of the University of Idaho. (-1940.)

Cattel, J. McK., and Jacques. American Men of Science, a Biographical Directory. The Science Press of New York. 1933.

Chamberlin, W. J. "Obituary of Arthur Lester Lovett." Ent. News. Vol. XXXV, July, 1924, pp. 263-264.

Chamberlin, W. J. A Brief History of Entomology in the United States. 1937. A 300 page typewritten manuscript containing much of interest to any entomologist. Unfortunately only two copies exist: one in the possession of the Department of Entomology at Oregon State College and the other in the possession of the author. Accurate within its limits, it was designed for lecture usage and consequently is not too well documented and contains but little information on the Pacific Northwest.

Chamberlin, W. J. "The Ticks of Oregon." Ore. Agric. Exp. Sta. Bull. 349, June, 1937.

Dean, G. A. et al. "Obituary of R. C. Treherne." Journ. Econ. Ent. Vol. 17, 1924. pp. 506-508.

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Essig, E. O. A History of Entomology. The Macmillan Company. New York, 1931. This book contains over 1000 profusely illustrated pages containing much information of historical interest. The title however is a misnomer because Essig is primarily concerned with California. Nevertheless it is the only comprehensive and accurate work of its kind in print.

Essig, E. O. "Itinerary of Lord Walsingham in California and Oregon, 1871-1872." Pan. Pac. Ent. Vol. XVII, No. 3, July, 1941. An intriguing and authentic paper by Professor Essig who made longhand copies of Walsingham's diaries in the British Museum.

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- Hammond, Wm., Reeves, Wm., Brookman, B., Izume, E. "Isolation of the Virus of Western Equine and St. Louis Encephalitis from Culex tarsalis mosquito." *Science* 94:328, Oct. 3, 1941.
- Hatch, M. H., Exline, Harriet. "The Black Widow Spider." *Journ. N. Y. Ent. Soc.* 52:449, 1934.
- Hatch, M. H. "Biology at the University of Washington." *The Biologist*, Vol. XX, No. 3. February, 1939. A scholarly little article tracing the history of biology at the University of Washington from its inception until the present time.
- Hatch, M. H. "A History of Zoology at the University of Washington." (An unpublished author's manuscript.) This is an extremely valuable document and written in the precise scholarly manner so valuable to a student of the history of science. The main work and revision have been made under Hatch although others of the University staff have contributed to it.
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- Howard, L. O. "Distribution of the Rocky Mountain Spotted Fever Tick." *U.S.D.A. Bur. Ent. Circ.* 136. 1911.
- Howard, L. O. "A History of Applied Entomology." *Smithsonian Misc. Coll.* Vol. 84, Nov. 29, 1930. Washington D.C.
- Kirsch, Frederick A. "A History of Entomology at Washington State College." an unpublished manuscript. 1942. The title is misleading inasmuch as the paper considers but little more than the various courses which have been offered at Washington State. However the work is very well done, dependable, and abstracted from the catalogues of the institution. It was prepared at the request of this writer.
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Mr. Weiss, possibly America's greatest recorder of historical
entomology, privately printed 150 copies of his 300 page
book. Actually the book is mimeographed. It contains well-
documented sketches of the early entomologists until 1865,
and forms an extremely valuable adjunct to our knowledge of
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which could logically come within the scope of this paper.

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