FRANK MORTON CARPENTER (1902–1994):
ACADEMIC BIOGRAPHY AND LIST OF PUBLICATIONS

BY DAVID G. FURTH¹

18 Hamilton Rd., Arlington, MA 02174

The present paper is meant to accompany the preceding one by Elizabeth Brosius, Assistant Editor at the University of Kansas, Paleontological Institute, who was extremely instrumental in aiding Prof. Frank Carpenter to finish his *Treatise on Invertebrate Paleontology* volumes on fossil insects. The Brosius paper is a brief profile taken from her personal interaction with Prof. Carpenter as well as numerous interviews about him with his friends, students, and colleagues. The present paper is intended to be more of an account of Prof. Carpenter's academic background and accomplishments with the addition of some personal and academic accounts of the author's interaction with Frank Carpenter.

Frank Morton Carpenter was born in Boston on 6 September 1902. When he was three years old his family (father Edwin A. and mother Maude Wall) moved from Boston to Revere and at age six his family moved to Melrose where he began to attend Lincoln School the following year. His father worked for the American Express Company but had a strong interest in natural history and taught his elder son (Edwin, four years older than Frank) about the constellations. Edwin later graduated from Harvard, studied astronomy, and became Director of the Astronomical Laboratory at the University of Arizona in Tucson. When Frank Carpenter was a sixth grader at Lincoln School his father encouraged his interest in butterflies and moths. In ninth grade Frank Carpenter began taking out books about insects from the Melrose Public Library. The preceding paper by Brosius relates the story about his early stimulation concerning fossil insects and his first meeting of the Cambridge Entomological Club. Frank Carpenter began Harvard University as a Freshman in 1922 and graduated with an A.B. *magna cum laude* in 1926 and as a member of Phi Beta Kappa. He

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¹ New address: Department of Entomology, Smithsonian Institution, Washington, D. C. 20560.

immediately began a graduate program under the direction of Prof. William Morton Wheeler, receiving a masters degree (S.M.) in 1927 and a D.Sc. in 1929. His graduate thesis concerned the fossil ants of North America and was published as a Bulletin of the Museum of Comparative Zoology (MCZ) in 1930 (see list below).

Frank Carpenter's professional career at Harvard University began by his being appointed as a Research Fellow in Applied Biology (1928), supported by a three year National Research Council postdoctoral grant, and continued with the following appointments: Associate in Entomology, MCZ (1931); Assistant Curator of Invertebrate Palaeontology, MCZ (1932); Instructor in Zoology (1935); Curator of Fossil Insects, MCZ (1936); Assistant Professor of Palaeontology, MCZ (1936); Associate Professor of Entomology, MCZ (1939); Member of the Board of Freshman Advisers (1942–1946, 1963–1965); Alexander Agassiz Professor of Zoology (1945) [four appointments for five years each and a final one for four years, all consecutively, 1950, 1955, 1960, 1965]¹; Acting Associate Dean of the Graduate School of Arts and Sciences (1946); Acting Director of University Extension (1954, 1958, 1964–1966); Chairman of the Evolutionary Biology Training Grant Committee (1965–1973); Fisher Professor of Natural History (1969) and Emeritus (1973); President of Phi Beta Kappa (1970–1971); Alexander Agassiz Professor of Zoology Emeritus (1973); Honorary Curator of Fossil Insects, MCZ (1973).

The fossil insect collections at Harvard's MCZ are second in importance only to those at the Institute of Palaeontology of the Russian Academy of Science (Moscow). This excellence was due to Frank Carpenter, the only curator of these collections, including during the last 20 years of his life as (voluntary) Honorary Curator. Frank had a very good relationship with his Russian colleagues and, through collaboration and two visits to Moscow, he amassed a superb library of Russian paleoentomology literature.

For almost 40 years Frank Carpenter taught entomology, paleontology, and related subjects at Harvard. He never took a sabbatical! His famous year-long course in entomology stimulated many students, a number of whom went on to become professional ento-

¹ According to Frank Carpenter, the Agassiz family bequest stated that if someone was appointed to an Agassiz Professorship for five consecutive terms of five years each, then that person was entitled to receive a salary for life.

mologists. As Edward O. Wilson wrote (1976, *J. Paleontology* 50(3):549–550), Frank Carpenter was the “embodiment of entomology at Harvard” and played a “role as paterfamilias of the Harvard entomological community.” Carpenter was chairman of the Department of Biology from 1952–1959, an important period of biological development at Harvard. Frank Carpenter was also a devoted teacher at the Harvard Extension School for more than 30 years, longer than any other professor, and besides being Acting Director several times, he was renowned for stimulating the interest of many students in insects and he considered this a very fulfilling experience.

Frank Carpenter’s influence in evolutionary biology was also recognized outside Harvard. During, and even after, his official academic career at Harvard he was awarded a number of research grants, especially from the National Science Foundation. He was a Fellow of the American Academy of Arts and Sciences and its Vice President from 1961 to 1963 and President of the National Scientific Research Society (Sigma Xi) from 1955 to 1957. In 1975 he was awarded the Paleontology Society Medal and in 1983 was elected an Honorary Fellow of the Royal Entomological Society. Finally, in 1993 he received the Thomas Say Award from the Entomological Society of America (Fig. 1).

As Robin Wootton, a close colleague of Frank Carpenter’s, described him (1994, *Antenna* 18(2):56–58): “Simply, he was the greatest ever palaeoentomologist.” Carpenter conducted research on fossil insects for almost 70 years, specializing in insects from the Paleozoic Era, an especially significant time, when many entire orders and families were completely different from the modern ones, unlike the Mesozoic. Carpenter particularly concentrated on the Permian and Carboniferous, publishing numerous papers on the Lower Permian fauna of Elmo, Kansas; the Lower Permian of Midco, Oklahoma; and the Carboniferous of North America (especially Mazon Creek, Illinois). However, he also published important works on other periods, e.g., Miocene shales of Florissant, Colorado and studies of amber from the Tertiary Baltic and Cretaceous Canadian deposits. Carpenter described one of the most famous fossil insects, a dragonfly from Elmo, with a wingspan of about 29 inches, *Meganeuropsis americana* Carpenter 1947, the largest insect ever known (Fig. 2).

Fig. 1. Prof. Frank M. Carpenter holding the Thomas Say Award, from the Entomological Society of America awarded in December 1993. This photo taken at his home was the last photo of Prof. Carpenter. (photo 28 December 1993, by David G. Furth)

Carpenter also produced many papers on extant insects, particularly Neuroptera, Raphidioidea and Mecoptera. One of his best known entomological contributions was as coauthor of the *Classification of Insects* (1954) with C. T. Brues and A. L. Melander. This book was one of the first to offer keys and literature for all extant

Fig. 2. Prof. Frank M. Carpenter with the fossil dragonfly *Meganeuropsis americana* Carpenter, the largest known insect. (photo taken at about the time of his retirement in 1973, photographer unknown to author)

insect families (and often subfamilies) worldwide, and it also contained sections on other terrestrial arthropods and extinct insects.

After his retirement in 1973, Frank Carpenter concentrated on completing the *Treatise* of fossil insects, while continuing to voluntarily care for the MCZ fossil insect collection, editing *Psyche*, and coordinating the smooth progress of the Cambridge Entomological Club (he was still its Treasurer, parliamentarian, and father figure). In these efforts he was tirelessly assisted by his devoted wife of 62 years, Ruth Skace Carpenter (Fig. 3).

Frank Carpenter was certainly the most important person in the history of the Cambridge Entomological Club. This society and its journal (*Psyche*), founded in 1874, are the second oldest entomological society and journal in the United States; only the American Entomological Society (Entomological Society of Philadelphia), founded in 1859, and its journal (*Transactions* started in 1866) are older. Frank Carpenter held the following positions in the Cambridge Entomological Club: Secretary (1927); Associate Editor (1927–1946); Vice President (1928, 1936, 1939); President (1929, 1930, 1940); Treasurer (1944–1989); Editor (1947–1990). As both Treasurer for 46 years and Associate Editor and Editor for 64 years, Frank Carpenter basically **was** the Cambridge Entomological Club for almost five decades. It is unlikely that anyone will ever be of equal importance to this society. In addition, Carpenter gave over 50 presentations at regular meetings of the Club. Frank Carpenter became a formal member of the Club during his Freshman year at Harvard (1922); however, he began attending meetings several years earlier while still in high school. In honor of his 70 years of membership, the 1991–1992 Club program of monthly speakers was dedicated to Frank Carpenter, and the final issue of volume 99 of *Psyche* was dedicated to him.

I met Frank Carpenter during the summer of 1971 while I was a graduate student in entomology at Cornell University. At Cornell Prof. William L. Brown, Jr. (a former student of Carpenter's) and I had struggled to determine a brachypterous brown lacewing, *Psectra diptera* (Burmeister) (Hemerobiidae), which I had collected years earlier at one of my favorite childhood collecting sites in Ohio. Brown advised me to show the specimen to Frank Carpenter at Harvard, which I did. Not only did I learn that this specimen represented a quite rare species, but, like so many others before

Fig. 3. Prof. Frank M. Carpenter and his wife Ruth searching for fossils in the Eocene Green River shales at Watson, Utah, July 1935.

and after, I was impressed with his graciousness—he was the definition of a perfect gentleman; that is, polite, gracious, modest, generous, and always well dressed.

I had the privilege of becoming a close colleague as well as personal friend of Frank Carpenter during his final years, taking over from him the editorship of *Psyche* and many of the responsibilities of the Cambridge Entomological Club. Frank told me many interesting stories about Harvard, the MCZ and its former directors, colleagues, students, and events. After hearing many of Frank's colleagues, students, and friends reminisce about the wonderful stories he told at his famous weekly teas, I decided to tape-record (audio) Frank telling these stories. These tapes have been deposited at the Harvard University Archives. It was a great honor and thrill for me to have been close with so great an entomologist as Frank Carpenter.

In his home town of Lexington, Massachusetts, on 18 January 1994, in his 92nd year, Frank Morton Carpenter became extinct. With this loss, the Department of Entomology at the MCZ of Harvard University and the world of entomology and paleontology will never be the same.

LIST OF PUBLICATIONS BY F.M. CARPENTER

1926

Fossil insects from the Lower Permian of Kansas. *Bull. Mus. Comp. Zool.* 67(13):437–444, pl.1–3.

1927

Notes on a collection of amber ants. *Psyche* 34(1):30–32.

A fossil insect from the Lower Permian of the Grand Canyon. *Proc. U. S. Nat. Mus.* 71:1–4, pl.1.

1928

A new Protodonatan from the Grand Canyon. *Psyche* 35(3):187–190, pl.5.

A Scorpion-fly from the Green River Eocene. *Ann. Carnegie Mus.* 28:241–249, 1 fig., pl.12.

1929

A Jurassic neuropteran from the lithographic limestone of Bavaria. *Psyche* 36(3):190–194, 1 fig.

1930

A fossil ant from the Lower Eocene (Wilcox) of Tennessee. *J. Wash. Acad. Sci.* 19(14):300–301, 1 fig.

The fossil ants of North America. *Bull. Mus. Comp. Zool.* 70(1):3–66, pl. 1–11.

The Lower Permian insects of Kansas. Part I. Introduction and the order Mecoptera. *Bull. Mus. Comp. Zool.* 70(2):69–101, 3 figs., pl.1–5.

A review of our present knowledge of the geological history of the insects. *Psyche* 37(1):15–34, 3 tables.

Um Blattide Permiano do Brasil. *Bol. Serv. Geol. Mineralog. Brasil* 50:4–11, 1 fig.

The interpretation of the wing venation and tracheation of the Odonata and Agnatha (by A.V. Martynov). [English translation from the Russian.] *Psyche* 37(3):245–280.

1931

The Lower Permian insects of Kansas. Part 2. The orders Paleodictyoptera, Protodonata, and Odonata. *Amer. J. Sci. (Series 5)* 21(122):97–139, 6 figs.

The Lower Permian insects of Kansas. Part 3. The Protohymenoptera. *Psyche* 37(4):343–374, 4 figs., pl.15–17. (1930)

The biology of the Mecoptera. *Psyche* 38(1):41–55, 1 fig.

The Lower Permian insects of Kansas. Part 4. The order Hemiptera, and additions to the Paleodictyoptera and Protohymenoptera. *Amer. J. Sci. (Series 5)* 22(128):113–130, 8 figs.

The affinities of *Holcorpa maculosa* Scudder and other Tertiary Mecoptera, with descriptions of new genera. J. N. Y. Ent. Soc. 39(3):405–414, 2 figs., pl.33.

Insects from the Miocene (Latah) of Washington: I. Introduction, VI. Trichoptera. Ann. Ent. Soc. Amer. 24(2):307–309, 319–322, 3 figs., [entire paper, 24(2): 307–323; 5 figs., pl.1; with T. D. A. Cockerell, C. H. Kennedy, T. E. Snyder, and H. F. Wickham]

Revision of the Nearctic Mecoptera. Bull. Mus. Comp. Zool. 72(6):205–277, 6 figs., pl.1–8.

Evolution of insects. Evolution 3(2):4–5, 4 figs.

Evolution of the Class Insecta. Amer. J. Sci. 21(126):531–539.
[with P. E. Raymond and A. Petrunkevitch]

1932

Neopanorpa hirsuta (Crampton). Psyche 38(4):184–185, 1 fig.

Jurassic insects from Solenhofen in the Carnegie Museum and the Museum of Comparative Zoology. Ann. Carnegie Mus. 21(3):97–129, 11 figs.

The Lower Permian insects of Kansas. Part 5. Psocoptera and additions to the Homoptera. Amer. J. Sci. (Series 5) 24(139):1–22, 11 figs.

Additional notes on Nearctic Mecoptera. Bull. Brooklyn Ent. Soc. 27(3):149–151.

1933

A new *Boreus* from British Columbia (Mecoptera). Can. Ent. 65(4):94–95, 1 fig.

Note on *Haplodictyus incertus* Navas. Psyche 39(4):144. (1932)

Trichoptera from the mountains of North Carolina and Tennessee. Psyche 40(1): 32–47, 1 fig., pl.1–2.

The Lower Permian insects of Kansas. Part 6. Delopteridae, Protelytroptera, Plecoptera and a new collection of Protodonata, Odonata, Megasecoptera, Homoptera, and Psocoptera. Proc. Amer. Acad. Arts Sci. 68(11):411–503, 29 figs., pl.1.

A new Megasecopteran from the Carboniferous of Kansas. Univ. Kans. Sci. Bull. 21(10):365–367, 1 fig.

1934

Carboniferous insects from Pennsylvania in the Carnegie Museum and the Museum of Comparative Zoology. Ann. Carnegie Mus. 22(3–4):323–341, 13 figs., pl.24.

1935

Tertiary insects of the family Chrysopidae. J. Palaeont. 9(3):259–271, 9 figs.

A new name for *Lithomyrmex* Carp. (Hymenoptera). Psyche 42(2):91.

New Nearctic Mecoptera, with notes on other species. Psyche 42(2):105–122, pl.10–11.

Fossil insects in Canadian Amber. Univ. Toronto Studies, Geol. Ser. 38:69.

The Lower Permian insects of Kansas. Part 7. The order Protoperlaria. *Proc. Amer. Acad. Arts. Sci.* 70(4):103–146, 11 figs, pl.1–2.

1936

Revision of the Nearctic Raphidiodea (recent and fossil). *Proc. Amer. Acad. Arts Sci.* 71(2):89–157, 13 figs., pl.1–2.

The Nemestrinidae of the Miocene of Florissant, Colorado, and their relations to the recent fauna. *J. Palaeont.* 10(5):395–409, 7 figs.

Descriptions and records of Nearctic Mecoptera. *Psyche* 43(2–3):56–64, 3 figs.

1937

Collecting fossil insects. *Harvard Alum. Bull.* 39(19):588–591, 4 figs.

William Morton Wheeler. *Science* 85(2214):533–535.

[third author with L. J. Henderson, T. Barbour, H. Zinsser]

William Morton Wheeler. *Bull. N. England Mus. Nat. Hist.* 84:3–8, 1 fig.

[third author with L. J. Henderson, T. Barbour, H. Zinsser]

Early views of fossils. *Evolution* 4(1):13, 2 figs.

Book Review: A monograph of the British Neuroptera, Vol. 1, by F.J. Killington. *Psyche* 44(1–2):59.

Insects and arachnids from Canadian Amber. *Univ. Toronto Studies, Geol. Ser. Introduction.* 40:7–13

[entire paper, 40:7–62, 12 figs.; with J. W. Folsom, E. O. Essig, A. C. Kinsey, C. T. Brues, M. W. Boesel, and H. E. Ewing]

A Permian insect from Coahuila, Mexico. *Amer. J. Sci.* 34(200):125–127, 1 fig. [with A. K. Miller]

William Morton Wheeler. *Ann. Ent. Soc. Amer.* 30(3):433–437, 1 fig.

[second author with A. L. Melander]

1938

The structure of Permian Homoptera and Psocoptera. *Nature* 141:164–165.

Discussions and Communications: “Neue Untersuchungen über die fossilen Insekten mit Ergänzungen und Nachträgen sowie Ausblicken auf phylogenetische palaeogeographische und allgemein biologische Probleme”. *Anton Handlirsch. Ann. Naturhist. Mus. Wien, Bd. 48*, pp. 1–140, 1937. *Amer. J. Sci.* 35:308–309.

Andreas Vassilievitch Martynov. *Psyche* 45(1):80–83, pl.12.

William Morton Wheeler. *Isis* 28(2):420–423, pl.9.

Fossil insects from the Creede Formation, Colorado. Part 1. Introduction, Neuroptera, Isoptera and Diptera. *Psyche* 54(2–3):105–119, 3 figs., pl.13.

[with T. E. Snyder, C. P. Alexander, M. T. James and F. M. Hull]

Two Carboniferous insects from the vicinity of Mazon Creek, Illinois. *Amer. J. Sci. (Series 5)* 36(216):445–452, 3 figs.

Mecoptera from China, with descriptions of new species. *Proc. Ent. Soc. Wash.* 40(9):267–281, pl.23–24.

1939

The Lower Permian insects of Kansas. Part 8. Additional Megasecoptera, Protodonata, Odonata, Homoptera, Psocoptera, Protelytroptera, Plectoptera, and Protoperlaria. *Proc. Amer. Acad. Arts Sci.* 73(3):29–70, 27 figs., pl.1–2.

Records and notes of Nearctic Mecoptera and Raphidioidea. *Bull. Brooklyn Ent. Soc.* 34(3):162–166, 1 fig.

1940

The fossil Pipunculidae. *Bernstein-Forschungen* 4:8–17, 9 figs.
[with F. M. Hull] (1939)

Carboniferous insects from the Stanton Formation, Kansas. *Amer. J. Sci. (Series 5)* 238(9):636–642, 1 fig., pl.1.

Book Review: A laboratory guide to the study of the evolution of the wings of insects, by J. Chester Bradley. 2nd ed. Ithaca, N.Y. *Psyche* 47(1):44.

A revision of the Nearctic Hemerobiidae, Berothidae, Sisyridae, Polystoechotidae and Dilaridae (Neuroptera). *Proc. Amer. Acad. Arts Sci.* 74(7):193–280, 75 figs., pl.1–3.

1941

A new genus of Mecoptera from Tasmania. *Papers Proc. Roy. Soc. Tasmania* 1940:51–53, pl.7–8. (1940)

The antiquity of social insects. *Psyche* 48(1):50–55.
[second author with J. C. Bequaert]

1943

Notes on Nearctic Neuroptera. *Psyche*. 49(3–4):49–51, 1 fig. (1942)

Studies on Carboniferous insects from Commentry, France; Part 1. Introduction and families Protagriidae, Meganeuridae, and Campylopteridae. *Bull. Geol. Soc. Amer.* 54:527–554, 5 figs., pl.1.

The Lower Permian insects of Kansas. Part 9. The orders Neuroptera, Raphidioidea, Caloneuroidea and Protorthoptera (Probnisidae), with additional Protodonata and Megasecoptera. *Proc. Amer. Acad. Arts Sci.* 75(2):55–84, 16 figs., pl.1.

Osmylidae of the Florissant Shales, Colorado (Insecta -Neuroptera). *Amer. J. Sci. (Series 5)* 241(12):753–760, 3 figs., pl.1.

1944

Carboniferous insects from the vicinity of Mazon Creek, Illinois. *Ill. State Mus. Sci. Papers* 3(1):1–20, 5 figs., pl.1–4. (1943)

Class Insecta. pp. 701, 703, 2 figs. *In*: H. W. Shimer and R. R. Shrock (Eds.), *Index fossils of North America*, The M.I.T. Press, Cambridge.

1945

Panorpidae from China (Mecoptera). *Psyche* 52(1–2):70–78, 7 figs., pl.10–11.

1947

Lower Permian insects from Oklahoma. Part 1. Introduction and the orders Megasecoptera, Protodonata, and Odonata. *Proc. Amer. Acad. Arts Sci.* 76(2): 25–54, 28 figs., pl.1–2.

Early insect life. *Psyche* 54(2):65–85, 9 figs.

Taxonomic notes on the Dilaridae (Neuroptera). *Psyche* 54(2):100–109, 5 figs.

1948

Notes on Chinese Panorpididae (Mecoptera). *Psyche* 55(1):28–30, 1 fig.

The supposed nymphs of the Palaeodictyoptera. *Psyche* 55(1):41–50, pl.6–7.

A Permian insect from Texas. *Psyche* 55(2):101–103, 1 fig.

1950

Fossil insects. *Gamma Alpha Record* (Harvard Issue) 40(3):61–68, 3 figs.

The Lower Permian insects of Kansas. Part 10. The order Protorthoptera: The family Liomopteridae and its relatives. *Proc. Amer. Acad. Arts Sci.* 78(4):187–219, 11 figs., pl.1–3.

1951

The structure and relationships of *Oliarces* (Neuroptera). *Psyche* 58(1):32–41, 3 figs., pl.4.

Studies on Carboniferous insects from Commentry, France; Part II. The Megasecoptera. *J. Paleont.* 25(3):336–355, 11 figs., pl.53.

Redescription of *Parapapolia superba* (Scudder) (Protorthoptera). *Psyche* 58(3): 108–110, 1 fig.

1953

Fossil insects. *Yearbook of Agric.*, 1952, pp. 14–19 (Sep. No. 2292), 2 figs.

The geological history and evolution of insects. *Amer. Sci.* 41(2):256–270, 7 figs.

The biology of *Brachypanorpa* (Mecoptera). *Psyche* 60(1):28–36, 1 fig., pl.2.

The geological history and evolution of insects. *In: G. A. Baitsell* (Ed.). *Science in Progress*. Ser. 8, Ch. 4, pp.71–89. Yale Univ. Press, New Haven.

1954

Additional notes on *Brachypanorpa*. *Psyche* 60(4):154. (1953)

Classification of insects (revised edition). *Bull. Mus. Comp. Zool.* 108:1–917, 1219 figs.

[third author with C. T. Brues and A. L. Melander]

The Baltic Amber Mecoptera. *Psyche* 61(1):31–40, 4 figs.

Nathan Banks. *Harvard University Gazette*, 49(17):118.

[fourth author with H. B. Bigelow, C. T. Brues, and A. S. Romer]

Nathan Banks, A biographical sketch and list of publications. *Psyche* 61(3):81–110, pl.5.

[with P. J. Darlington, Jr.]

1955

Neuroptera and Mecoptera. pp. 536–538. *In*: E. S. Ross (Ed.) Systematic Entomology. *In*: E. L. Kessel (Ed.), A Century of Progress in the Natural Sciences 1853–1953. California Academy of Sciences, San Francisco.

Fossil Insects. pp. 588–590. *In*: E. S. Ross (Ed.) Systematic Entomology. *In*: E. L. Kessel (Ed.), A Century of Progress in the Natural Sciences 1853–1953. California Academy of Sciences, San Francisco.

An Eocene *Bittacus* (Mecoptera). *Psyche* 62(1):39–41, 2 figs.

Redescription of *Spiloconis picticornis* Banks (Neuroptera: Coniopterygidae). *Psyche* 62(2):69–74, pl.7.

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[second author with A. L. Melander]

Charles Thomas Brues. *Harvard University Gazette* 51(14):107–108.
[third author with A. S. Romer and I. W. Bailey]

1957

The Baltic Amber Snake-flies (Neuroptera). *Psyche* 63(3):77–81, 3 figs. (1956)

1958

A Pliocene insect deposit in Texas. *Psyche* 64(3):116. (1957)

1959

Mexican Snake-flies (Neuroptera: Raphidioidea). *Psyche* 65(2–3): 52–58, 3 figs., pl.7. (1958)

1960

Fossil Nemopteridae (Neuroptera). *Psyche* 66(1–2):20–24, 1 fig., pl.1. (1959)

1961

The female of *Inocellia pilicornis* Carp. (Neuroptera: Inocelliidae). *Psyche* 67(1–2): 41–42, 1 fig. (1960)

A Triassic odonate from Argentina. *Psyche* 67(3):71–75, 1 fig., pl.9. (1960)

Insects of Micronesia. Neuroptera: Hemerobiidae. Vol. 8(3):35–43, 4 figs. B. P. Bishop Museum, Honolulu.

Studies on North American Carboniferous insects. 1. The Protodonata. *Psyche* 67(4):98–110, 4 figs., pl.11. (1960)

1962

Book Review: Introduction to entomology, by R. Jeannel, translated by Harold Oldroyd, 1960. *Amer. Sci.* 50:178A, 180A.

Studies on Carboniferous insects of Commeny, France: Part III. The Caloneuroidea. *Psyche* 68(4):145–153, 2 figs. (1961)

A Permian Megasecopter from Texas. *Psyche* 69(1):37–41, 2 figs., pl.1.

1963

A Megasecopter from Upper Carboniferous strata in Spain. *Psyche* 70(1):44–49, 1 fig., pl.4–5.

Studies on North American Carboniferous Insects. 2. The genus *Brodioptera* from the Maritime Provinces, Canada. *Psyche* 70(1):59–63, 2 figs.

Studies on Carboniferous insects from Commentry, France: Part IV. The genus *Triplosoba*. *Psyche* 70(2):120–128, pl.13–14.

Studies on Carboniferous insects of Commentry, France: Part V. The genus *Diaphanoptera* and the order Diaphanopteroidea. *Psyche* 70(4):240–256, 1 fig., pl.28–30.

1964

Studies on the Carboniferous insects of Commentry, France: Part VI. The genus *Dictyoptilus* (Palaeodictyoptera). *Psyche* 71(2):104–116, 1 fig., pl.13–14.

Studies on North American Carboniferous insects. 3. A spilipterid from the vicinity of Mazon Creek, Illinois (Palaeodictyoptera). *Psyche* 71(3):116–124, pl.15–18.

Lower Permian insect fauna from Elmo, Kansas. pp. 302–303. In: R. C. Moore, Paleocological aspects of Kansas Pennsylvanian and Permian cyclothems. In: D. F. Merriam (Ed.), Symposium on cyclic sedimentation. Kansas State Geol. Surv. Bull. 169(1):1–380.

1965

The structure of the Protelytroptera, with description of a new genus from Permian strata of Moravia. *Psyche* 71(4):183–197, 6 figs., pl.22.
[with J. Kukalova] (1964)

Studies on North American Carboniferous insects. 4. The genera *Metropator*, *Eubleptus*, *Hapaloptera* and *Hadentomum*. *Psyche* 72(2):175–190, 7 figs.

1966

The Lower Permian insects of Kansas. Part 11. The orders Protorthoptera and Orthoptera. *Psyche* 73(1):46–88, 20 figs., pl.4–7.

1967

The first Mesozoic ants, with the description of a new subfamily. *Psyche* 74(1): 1–19, 2 tables, 4 figs., pl.1–4.
[second author with E. O. Wilson and W. L. Brown, Jr.]

Studies on North American Carboniferous insects. 5. Palaeodictyoptera and Megasecoptera from Illinois and Tennessee, with a discussion of the order Sypharopteroidea. *Psyche* 74(1):58–84, 5 figs., pl.8–14.

The first Mesozoic ants. *Science* 157(3792):1038–1040, 2 figs..
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1968

The structure and relationships of *Stephanomioptera* Guthörl (Miomoptera-Palaeomanteidae). *Psyche* 74(3):224–227, 2 figs. (1967)

Cretaceous Insects from Labrador. 2. A new family of Snake-flies (Neuroptera: Alloraphidiidae). *Psyche* 74(4):270–275, 2 figs., pl.35.
[entire paper, 74(4): 267–289, with E. Dorf and A. Emerson] (1967)

The affinities of the genus *Sobobapteron* Pierce. *Bull. So. Calif. Acad. Sci.* 67(4): 263–265, 1 fig.

Hexapoda. (p.1369) *In*: R.C. Moore, *et al.* (53 authors) “Developments, trends, and outlooks in Paleontology”. *J. Paleont.* 42(6):1327–1377.

1969

Megasecopterous nymphs in Pennsylvanian concretions from Illinois. *Psyche* 75(4): 295–309, 2 figs., pl.24–28.
[with E. S. Richardson, Jr.] (1968)

1970

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