

ATLANTA

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Dr. C.B. WILLIAMS 90 Jahre alt



Dr. C.B. WILLIAMS als junger Entomologe 1932

OÖ. Landesmuseum
Biologiezentrum

Der eigentliche Begründer der Wanderfalter – und generell der Insektenmigrationsforschung, Dr. C.B. WILLIAMS, konnte 1979 sein 90. Lebensjahr vollenden. Dies war mit ein Grund, diese so hoch verdiente Persönlichkeit zum Ehrenmitglied der DFZS zu ernennen, deren Mitglied WILLIAMS schon mehrere Jahre ist.

Wer sich mit den Insektenwanderungen beschäftigt, der ist sicherlich mit irgend einer der zahlreichen Arbeiten aus der Feder von WILLIAMS konfrontiert worden. Die Leistungen von WILLIAMS sind unschätzbar. Er war der erste Entomologe, der alle Quellen über das Migrationsgeschehen ordnete und zu analysieren versuchte. So schuf er überhaupt erst die Basis für weitere Forschungen auf diesem Gebiet. Wie überragend diese Leistung ist, wurde mir erst dann so richtig bewußt, als ich erfuhr, daß die Migrationsforschung nur eine Freizeitbeschäftigung von WILLIAMS war. So schrieb er mir am 19. November 1979:

„One point I might mention is that my studies of Insectmigration have been a personal part of my Entomology. Mostly a side-study, done in my spare time, but taking advantage of the many opportunities that occurred while I was wandering round the world on other problems.“

WILLIAMS wurde am 7. Oktober 1889 in Liverpool geboren. Schon als kleiner Schuljunge begeisterten ihn die Insekten. Das Interesse an diesen wuchs mehr



Dr. C.B. WILLIAMS und seine Frau. Aufnahme 1979

und mehr und gab den Ausschlag, Naturwissenschaften zu studieren. Von 1908-1911 studierte er dann auch Chemie, Physik, Botanik, Zoologie und Landwirtschaft an der Universität in Cambridge. Danach war er als Entomologe an vielen Instituten tätig. Chronologisch nun die einzelnen Stationen:

- 1911-1915: Entomologe in der John Innes Institution in London. Besonderes Arbeitsgebiet waren die Thysanopteren.
- 1915-1920: Department of Agriculture, Trinidad, West Indies. Untersuchung der Insektenschäden an Zuckerrohr (besonders von Cercopiden) und die Suche nach natürlichen Feinden. Untersuchung des Virusbefalls an Zuckerrohr. Beobachtung der ersten Schmetterlingswanderungen.
- 1920-1927: Arbeit in der Entomology Section of Ministry of Agriculture, deren Direktor WILLIAMS von 1923-27 war. Untersuchung des Insektenbefalls an Baumwoll- und Citrusplantagen. Beobachtung vieler Schmetterlingswanderungen.
- 1927-1930: Tätigkeit in Tanganyika, Ostafrika, an der Agricultural Research Station von Amani. Es werden vor allem die Wanderheuschrecken bearbeitet. Weitere Beobachtungen von Wanderfalterzügen.
- 1929-1931: Dozent in Edinburgh über Forst-Entomologie. Fertigstellung des Buches über „Migration of Butterflies“.
- 1931-1954: Vorstand des Department of Entomology, Rothamsted Experimental Station (20 Meilen nördlich von London). Statistische Studien an Insekten-Populationen und Einfluß des Wetters auf die Populationsdynamik.
- 1955-1960: Die Populationsstudien werden in Inverness, Scotland, mit Lichtfallen für weitere vier Jahre fortgesetzt.
- 1961-1962: Edinburgh, Scotland.
- 1963-1971: Selkirk, Scotland.
- Seit 1972 lebt WILLIAMS zusammen mit seiner Frau in Kirkcudbright, Scotland.

Vor einigen Jahren übergab er alle seine Unterlagen (Sammlung, Bücher, Sonderdrucke, Karteien etc.) an die Universität Oxford, wo diese für jedermann zugänglich sein sollen. WILLIAMS hielt lediglich alle Unterlagen über *Cynthia cardui* zurück, die noch ausgewertet werden sollen. Auch diese Unterlagen sind dann für Oxford bestimmt.

Es bleibt nur zu hoffen und zu wünschen, daß Dr. WILLIAMS noch viele Jahre geistig und körperlich frisch an der Seite seiner Frau verbringen kann.

Die nachstehend aufgeführten Arbeiten, erschienen von 1913-1975, wurden einer Liste entnommen, die mir freundlicherweise Dr. WILLIAMS zuschickte, wofür ich ihm herzlich danken möchte.

I. Systematics and Biology of Thysanoptera

- 1) 1913: On two new species of Thysanoptera from the West Indies. — Journ. Econ. Biol. **8**: 209-215
- 2) Records and descriptions of British Thysanoptera. — Journ. Econ. Biol. **8**: 216-230
- 3) 1914: A new species of Chirothrips (Thysanoptera) from South America. — Entomologist **47**: 51-53
- 4) Kakothrips n.g., a division of the genus Frankliniella, (Thysanoptera). — Entomologist **47**: 247-248
- 5) 1915: The Pea Thrips (Kakothrips robustus). — Ann. Appl. Biol. **1**: 222-246
- 6) (With J. D. HOOD). New Thysanoptera from Florida and Louisiana. — J. New York Ent. Soc. **23**: 121-138
- 7) A new thrips damaging-coffee in British East Africa. — Bull. Ent. Res. **6**: 269-272
- 8) 1916: Thrips oryzae sp. nov. injurious to rice in India. — Bull. Ent. Res. **6**: 353-355
- 9) Biological and systematic notes on British Thysanoptera. — Entomologist **49**: 221-227, 243-245 and 275-284
- 10) 1917: A new thrips damaging orchids in the West Indies. — Bull. Ent. Res. **8**: 59-61
- 11) 1918: Notes on some Trinidad thrips of economic importance. — Bull. Dept. Agr. Trinidad and Tobago. **17**: 143-146
- 12) 1921: A blood sucking thrips. — Entomologist **54**: 163-164
- 13) 1925: (With J. D. HOOD) In HOODs „New neotropical Thysanoptera collected by C.B.WILLIAMS“.—Psyche **32**: 48-69, one new genus and two new species are credited, on pp.68-69, to „HOOD and WILLIAMS“.
- 14) 1927: (With J. D. HOOD). A synopsis of the Thysanopterous family Urothripidae. — Ann. Ent. Soc. America **20**: 1-8
- 15) 1961: Notes on Thysanoptera. — Entomologist **94**: 139-140
- 16) 1972: A graphical method of demonstrating allometric growth, with special reference to the antennae of Thysanoptera. — Journ. Entom. (R. Ent. Soc. London) **B. 41**: 151-153

II. Sugar Cane Pests and Diseases in the West Indies

- 17) 1917: Notes on a froghopper attacking sugar-cane at Marienburg Estate, Surinam. — Bull. Ent. Res. **7**: 271-272
- 18) 1918: The sugar-cane froghopper in Grenada. — Bull. Ent. Res. **9**: 83-87
A froghopper on sugar-cane in British Guiana. — Bull. Ent. Res. **9**: 163-173
- 19) 1919: The food of the mongoose in Trinidad. — Bull. Dept. Agr. Trinidad **17**: 167-176

- 20) 1919: Report on Mr. Glasgow's supposed cure for froghoppers. — Bull. Dept. Agr. Trinidad **18**: 10-15
- 21) Relation of root-fungus to froghopper blight. — Bull. Dept. Agr. Trinidad **18**: 52-56
- 22) Sugar-cane varieties and froghopper blight. — Bull. Dept. Agr. Trinidad **18**: 70-83
- 23) Rainfall, sugar production and froghopper blight in Trinidad. — Bull. Dept. Agr. Trinidad **18**: 153-167
- 24) 1920: (With WM. NOWELL) Sugar-cane Blight in Trinidad; a summary of conclusions. — Bull. Dept. Agr. Trinidad **19**: 8-10
- 25) The mosaic disease of sugar-cane in Trinidad. — Bull. Dept. Agr. Trinidad **19**: 30-37
- 26) A pannier hopper-dozer. — Bull. Ent. Res. **11**: 179-180
- 27) 1921: Report on Froghopper Blight of Sugar-cane in Trinidad. — Dept. Agr. Trinidad, Memoir No. 1. 170 pp.
- 28) Sugar-cane pests and diseases in Trinidad in 1920. — Bull. Dept. Agr. Trinidad **19**: 111-121
- 29) 1923: A froghopper damaging cacao in Panama. — Bull. Ent. Res. **13**: 271-274

III. Pests of Cotton and other crops in Egypt

- 30) 1923: The Pink Boll Worm in Egypt in 1922. Third Ann. Rept. — Cotton Res. Board. Egypt. p. 1-7
- 31) 1925: (With I. BISHARA). The survival of the Pink Boll Worm in buried seed during the winter in Egypt. — Min. Agr. Egypt. Tech. Bull. **58**: 7 pp.
- 32) 1926: Seasonal variation in Pink Boll Worm attack in cotton in Egypt in the years 1916-1924. — Min. Agr. Egypt. Techn. Bull. **67**: 12 pp
- 33) 1927: Diseases and pests of Cotton in Egypt. — Manchester Guardian Commercial. 17 May, 1927. p. 24
- 34) Destruction of the Pink Boll Worms in cotton seed in Egypt. — Offic. Rept. Internat. Cotton Cong. Egypt. p. 49-52
- 35) 1933: The Boll Worms of Cotton. — Empire Cotton Growing Rev. **10**: 273-281
- 36) 1934: The cotton stainer problem. — Empire cotton growing Rev. **11**: 99-110
- 37) The European Corn-borer in Egypt. — In. Econ. Ent. **27**: 719
- 38) Field studies in the relation of insects to climatic conditions, with special reference to cotton. — Empire Cotton Growing Conference on Cotton growing problems. London 1934. Report p. 111-119

IV a. Principal Papers on Insect Migration

- 39) 1917: Some notes on butterfly migration in British Guiana. — Trans. Ent. Soc. London 1917: 154-164
- 40) 1919: A migration of yellow butterflies (*Catopsilia statira*) in Trinidad.— Trans. Ent. Soc. London 1919: 76-88
- 41) Observations on Neotropical Insects. — Proc. Ent. Soc. London 1919: 23-24
- 42) 1920: Records of Insect migration in tropical America. — Trans. Ent. Soc. London 1920: 146-165
- 43) 1923: Records and problems of insect migration. — Trans. Ent. Soc. London 1923: 207-233
- 44) 1925: Notes on insect migration in Egypt and the near East. — Trans. Ent. Soc. London 1924: 439-456
- 45) The migrations of the Painted Lady Butterfly. — Nature 115: 535-537 and 533
- 46) 1926: Some unsolved problems of insect migration. — Proc. 3rd Internat. Cong. Entom. Zürich 1925 2: 100-108
- 47) Voluntary or involuntary migration of insects. — Entomologist 59: 281-288
- 48) Further records of insect migration. — Trans. Ent. Soc. London 74: 193-202
- 49) 1927: Records of migratory insects, chiefly from Africa. — Bull. Soc. Roy. Ent. Egypt 10: 224-256
- 50) A study of butterfly migration in South India and Ceylon. — Trans. Ent. Soc. London 75: 1-33
- 51) 1928: Collected records relating to insect migration. — Trans. Ent. Soc. London 76: 79-91
- 52) 1929: Some records of dragon-fly migration. — Entomologist 62: 145-148
- 53) The seasonal abundance of four common butterflies in Egypt. — Bull. Soc. Roy. Ent. Egypt 13: 85-92 (with I. BISHARA)
- 54) Evidence for the migration of butterflies. — Bull. Soc. Roy. Ent. Egypt. 13: 193-210
- 55) 1930: Records of butterfly migration in East Africa. — J. East Afr. Uganda Nat. Hist. Soc. No. 35: 9-24
- 56) Collected records relating to insect migration; second series. — Trans. Ent. Soc. London 78: 139-170
- 57) „The migration of Butterflies“. — Edinburgh (Oliver and Boyd) pp XI + 473, 800 ref
- 58) A migratory *Sphex* predacious on migratory locusta. — Proc. Ent. Soc. London 5: 56
- 59) 1931: A migratory flight of the butterfly *Belenois mesentina* in East Africa in 1930. — Proc. R. Phys. Soc. Edinburgh 22: 35-39
- 60) 1932: Notes on *Vanessa cardui* at Sea off the West Coast of Africa. — Proc. Ent. Soc. London 7: 57

- 61) 1933: Further collected records relating to insect migration. — Trans. R. Ent. Soc. London **81**: 103-115
- 62) Observations on the Desert Locust in East Africa. — Ann. Appl. Biol. **20**: 463-497
- 63) 1935: Further evidence for the migration of butterflies. — Bull. Soc. R. Ent. Egypt **1935**: 250-261
- 64) British immigrant butterflies and moths. — British Museum Pamphlet E. 57
- 65) 1936: Collected records relating to insect migration. — Third Series. — Proc. R. Ent. Soc. London. A. **11**: 6-10
- 66) 1937: Butterfly travellers. — Nat. Geog. Mag. **71**: 568-586
- 67) Butterfly migration in the tropics. — Brit. Museum pamphlet E. 58
- 68) The migrations of day-flying moths of the genus *Urania* in tropical America. — Proc. R. Ent. Soc. London, A **12**: 141-147
- 69) 1938: Recent progress in the study of some North American migrant butterflies. — Ann. Ent. Soc. America **31**: 211-239
- 70) The migration of butterflies in India. — J. Bombay Nat. History Soc. **40**: 439-457
- 71) 1939: The migrations of the Cabbage-White butterfly (*Pieris brassicae*).— 7th Internat. Kong. Ent. Berlin 1938, **1**: 482-492
- 72) Records of butterfly migration in Africa. — Proc. R. Ent. Soc. London, A **14**: 69-74
- 73) Some butterfly migrations in Europe, Asia and Australia. — Proc. R. Ent. Soc. London, A **14**: 131-137
- 74) Some records of butterfly migration in America. — Proc. R. Ent. Soc. London A **14**: 139-144
- 75) 1942: (With Cockbill, Downes and Gibbs). Studies in the migration of Lepidoptera. — Trans. R. Ent. Soc. London **92**: 101-283 with c. 600 ref.
- 76) 1943: Notes on some Monarch butterflies caught in Great Britain. — Entomologist **76**: 1-3
- 77) 1945: Occurrence of *Vanessa cardui* at sea of the West African coast. — Proc. R. Ent. Soc. London, A **20**: 4-5
- 78) Notes on the fat content of two migrant moths. — Proc. R. Ent. Soc. London, A **20**: 6-13
- 79) Evidence of migration of Lepidoptera in South America. — Revist. Ent. (Rio de Janeiro) **16**: 113-131
- 80) (With G. BEAL). Geographical variation in wing-length of *Danaus plexippus*. — Proc. R. Ent. Soc. London, A **20**: 65-76
- 81) 1946: Migration of butterflies in South America. — in Livre de HOMINAGEM a R.F. d'Almeida' Sao Paulo, Brasil p. 335-340
- 82) 1949: Migration of butterflies in North America. — Lep. News **3**: 17-18
- 83) Migration of Lepidoptera and the problem of orientation. — Proc. R. Ent. Soc. London C **13**: 70-84

- 84) 1949: The migration of butterflies outside North America. — *Lep. News* **3**: 39-40
- 85) 1950: (With D. LONG). Phase colouration in larvae of Lepidoptera. — *Nature* **166**: 1035
- 86) 1951: Seasonal changes of flight direction of migrant butterflies in the British Isles. — *J. Anim. Ecology* **20**: 180-190
- 87) Migrations of Libytheine butterflies in Africa. — *Nigerian Field* **16**: 152-159
- 88) 1953: Migration and drift of insects in its international aspect. — *Trans. 9th Internat. Cong. Ent. Amsterdam 1951. I* 63-68
- 89) 1954 Notes on a small collection of Sphingidae from Nigeria. — *Nigerian Field* **19**: 176-179
- 90) Notes on some migration of butterflies in West Africa. — *Entomologist* **87**: 203-206
- 91) (With M. H. WESTMACOTT). Migration of Lepidoptera in Nepal. — *Entomologist* **87**: 232-234
- 92) 1956: (With COMMON, FRENCH, MUSPRATT and WILLIAMS M.C.). Observations of the migrations of insects in the Pyrenees. — *Trans. R. Ent. Soc. London* **108**: 385-407
- 93) 1957: Insect Migration. — *Ann. Rev. Ent.* **2**: 163-180
- 94) 1958: „Insect Migration“ London (Collins) New York (MacMillan). pp. XIV + 237
- 95) Diamond-back moth. — *Proc. R. Ent. Soc. London C.* **23**: 35
- 96) 1961: „Die Wanderflüge der Insekten“ Hamburg. — (Paul Parey, Hamburg, Berlin). German translation of „Insect Migration“ (above) with some omissions; and some additions by H. ROER
- 97) 1965: Insect migration. A review. — *Bull. Amat. Ent. Soc.* **24**: 135-147
- 98) 1970: The migrations of the Painted Lady Butterfly (*Vanessa cardui*) with special reference to North America. — *Lepid. Soc.* **24**: 157-175

IV b. Insect Migration. Minor Publications

- 99) 1925: Wandering Butterflies. — *Graphic*, London 1925: 230
- 100) 1926: Migration of butterflies. — *Nature* **118**: 118-119
- 101) 1930: Migration in butterflies and moths. — *Nature* **126**: 630-631
- 102) 1933: Report of insect immigration committee; summary of scientific results obtained in 1931-32. — *S.E. Union Sci. Soc. Bull.* **62**: 2-9
- 103) 1934: British immigrant insects. — *Trans. S. E. Union Sci. Soc.* **63**: 42-50
- 104) 1935: Immigration of insects into the British Isles. — *Nature* **135**: 9-10
- 105) Butterfly immigrants in Britain. — *Discovery* **16**: 36-39
- 106) 1936: Our Butterfly Visitors from abroad Countries

- 107) 1936: Africa-Iceland. The Butterfly Highway. — The Zoo (London) 1: 26-27
- 108) 1938: The migration of butterflies. — Field London, 171-734
- 109) World migrations of butterflies. — Field, London. 171-794
- 110) Recent progress in the study of insect migration. — S. E. Antiquary & Nat. 43: 88-91
- 111) 1939: Butterfly migrants. — Microscope and Ent. Monthly. 3: 246-251
- 112) 1940: Another record of *Danaus plexippus* in Great Britain. — Entomologist 73: 173
- 113) 1941: The mystery of butterfly migration. — Country Life, London. 89: 430-431
- 114) Note added to „Butterfly migrations from Melbourne to Tasmania“.— Entomologist 74: 188-190
- 115) *Mariposa migratoria*. — Revista Argentina de Zoogeographia
- 116) 1946: Migration of butterflies (summary of lecture). — J. R. Soc. Arts 94: 178-179
- 117) Migration of Animals. — Encyclopedia Britannica 15: 473-476
- 118) 1948: The migration of butterflies. — Daily Mail (London), School Aid Booklet. 19 pp
- 119) Some problems of animal migration. — New Nat. Journ. London 1: 133-140
- 120) Notes on British immigrant butterflies. — New Nat. Journ. 1: 141-144
- 121) 1949: Insect flight and distribution. — Nature 182: 904-905
- 122) (Anon) Butterflies on the wing. — Times, London. Dec. 3 1949
- 123) 1950: Butterfly migrations. — New Biol. London 9: 58-75
- 124) 1951: Butterflies at sea. — Countryman. Summer 1951. 386-388
- 125) 1952: How far do insects travel. — Rothamsted Exper. Stat. Rept. for 1951: 175-180
- 126) 1956: Insects at sea. — Marine Observer 26: 26-27
- 127) 1961: Migration of Lepidoptera, Coleoptera and Diptera. — Animal Behaviour. 9: 234
- 128) 1969: Foreword to „Migration and Dispersal of Insects“ by C. G. JOHNSON LONDON, E. METHUEN, p. XVII

V. Traps, Instruments and other Techniques

- 129) 1913: The Berlese funnel. — Entomologist 46: 273-274
- 130) 1923: A new type of light trap for insects. — Min. Agr. Egypt. Tech. Bull. 28: 2 pp.
- 131) 1924: (With T. W. KIRKPATRICK). A multiple temperature incubator.— Min. Agr. Egypt, Tech. Bull. 38: 4 pp.
- 132) An improved light trap for insects. — Bull. Ent. Res. 15: 57-60

- 133) 1927: A chart recording weighing machine for bee-keeping and other research. — Bull. Ent. Res. **18**: 63-65
- 134) 1935: (With G. A. EMERY). A photographic moonlight recorder. — Journ. Sci. Instr. **12**: 111-115
- 135) 1936: (With P. S. MILNE). A mechanical insect trap. — Bull. Ent. Res. **26**: 543-551
- 136) A modified Greenwich night-cloud recorder, used for ecological work. — Journ. Anim. Ecol. **5**: 348-350
- 137) 1943: A method of collecting and storing, without pressure, insects and galls attached to leaves. — Proc. R. Ent. Soc. London, A **18**: 1-2
- 138) A safe method of measuring the wings of set butterflies. — Proc. R. Ent. Soc. London, A **18**: 3-5
- 139) 1948: The Rothamsted light trap.—Proc.R.Ent.Soc.London. A **23**: 80-85
- 140) 1949: A light trap for insects. — Lep. News **3**: 63-64
- 141) 1951: Comparing the efficiency of insect traps. — Bull. Ent. Res. **42**: 513-517
- 142) 1955: A second experiment in testing the efficiency of insect traps. — Bull. Ent. Res. **46**: 193-204

VI. General ecology — Bioclimatics — Relation of insect activity and abundance to climate and weather — Statistical analysis of trap records

- 143) 1920: Rainfall, sugar production and froghopperblight in Trinidad. — Bull. Dept. Agr. Trinidad **18**: 156-167
- 144) 1923: A short bioclimatic study in the Egyptian desert. — Min. Agr. Egypt. Tech. Bull. **29**: 18 pp
- 145) The cotton plant in relation to temperature and rainfall. — Min. Agr. Egypt, Tech. Bull. **32**: 5 pp
- 146) 1924: Bioclimatic observations in the Egyptian desert in March 1923. — Min. Agr. Egypt. Tech. Bull. **37**: 18 pp.
- 147) (With E. McKENZIE TAYLOR). A comparison of sand and soil temperatures in Egypt. — Min. Agr. Egypt. Tech. Bull. **40**: 24 pp.
- 148) 1925: Cotton growing in relation to climate in Egypt and the Sudan. — Min. Agr. Egypt. Tech. Bull. **47**: 31 pp.
- 149) A third bioclimatic study in the Egyptain desert. — Min. Agr. Egypt. Tech. Bull. **50**: 32 pp.
- 150) The seasonal prevalence of fleas in Egypt. — Bull. Ent. Res. **15**: 353-355
- 151) 1926: Seasonal variation in pink-boll worm attack on cotton in Egypt in the years 1916-1924. — Min. Agr. Egypt. Tech. Bull. **67**: 12 pp.

- 152) 1929: (With I. BISHARA). The seasonal abundance of four common butterflies in Egypt. — Bull. Soc. R. Ent. Egypt **13**: 85-92
- 153) 1933: Observations on the desert locust in East Africa. — Ann. Appl. Biol. **20**: 463-497
- 154) 1934: Field studies in the relation of insect pests to climatic conditions.— Rept. Conf. Cotton Growing Corp. London **1934**: 111-119
- 155) 1935: (With F. J. KILLINGTON). Hermerobiidae and Chrysopidae in a light trap at Rothamsted. — Trans. Soc. Brit. Ent. **2**: 145-150
- 156) The times of activity of certain nocturnal insects, chiefly Lepidoptera, as indicated by a light trap. — Trans. R. Ent. Soc. London. **83**: 523-555
- 157) 1936: The influence of moonlight on the activity of certain nocturnal insects as indicated by a light trap. — Phil. Trans. Roy. Soc. London, B **226**: 337-389
- 158) 1937: The use of logarithms in the interpretation of certain entomological problems. — Ann. Appl. Biol. **24**: 404-414
- 159) 1939: An analysis of four years captures of insects in a light trap. Part I, General survey sex proportions, phenology and time of flight.— Trans. R. Ent. Soc. London **89**: 79-131
- 160) 1940: An analysis of four years captures of insects in a light trap. Part II. The effect of weather conditions on insect activity, and the estimation and fore-casting of changes in insect population. — Trans. R. Ent. Soc. London **90**: 227-306
- 161) Four years captures of insects in a light trap at Harpendon.— S.E. naturalist and Antiquary **44**: 74
- 162) The number of insects caught in a light trap at Rothamsted during four years 1933 — 1937. — Proc. R. Ent. Soc. London, A **15**: 78-80
- 163) 1943: Birds and Butterflies. — Nature **151**: 76
- 164) 1946: Climate and insect life. — Nature **157**: 214-215
- 165) 1947: The field of research in preventive entomology. Presidential address. — Ann. Appl. Biol. **34**: 175-185
- 166) 1948: Ecology and the balance of nature. In „Biology“ London, Odhams Press. pp. 305-317
- 167) 1949: An attempt to forecast changes in insect populations. — Brit. Science News **2**: 360-362
- 168) 1951: Changes in insect populations in the field in relation to preceding weather conditions. — Proc. Roy. Soc. London B. **138**: 130-156
- 169) (With B. P. SINGH). Effect of moonlight on insect activity. — Nature **167**: 853
- 170) Lepidoptera at light in a Hertfordshire wood. — Entomologist **84**: 260-261
- 171) 1952: Some notes on killing insects for collections and for scientific research. — Entomologist **85**: 271-279

- 172) 1953: Comment on Query 96 (missing plot). — *Biometrics* **9**: 425-427
- 173) 1954: The statistical outlook in relation to ecology. — *Journ. Ecol.* **42**: 1-13
- 174) Some bioclimatic observations in the Egyptian desert. — In „Biology of Desert's“ p. 18-27. *Instit. Biol. London*
- 175) 1956: (With B. P. SING and S. el ZIADY) An investigation into the possible effects of moonlight on the activity of insects in the field. — *Proc. R. Ent. Soc. London A* **31**: 135-144
- 176) 1957: (With S. el ZIADY) On the relative distribution of insects at 5 and 30 feet. — *Bull. Soc. Ent. Egypte* **41**: 663-675
- 177) 1960: (With M.F.H. OSMAN) A new approach to the problem optimum temperature for insect activity. — *Journ. Anim. Ecology* **29**: 187-189
- 178) 1961: Studies in the effect of weather conditions on the activity and abundance of insect populations. — *Phil. Trans. Roy. Soc. London, B* **244**: 331-378
- 179) 1949: The Biology of the Seasons. — *New Nat. In., (London)* **2**: 1-14
- 180) 1953: Graphical and Statistical methods in the study of insect phenology. — *Trans. 9th Internat. Cong. Ent. Amsterdam* **2**: 174-189
- 181) 1954: Phenology; the study of the seasons. — *Advancement of Sc. (London)* **11**: 267-270
- 182) 1965: Phenology. — *Animals, Lond* **6**: 153-154; Also in „Le monde Animaux Paris“ No. 23
- 183) Phenology. — In *Encyclopedia Brittanica* **7**: 806-807
- 184) 1967: The changing seasons. — *Listener (London)* **77**: 819-820

VII. Population studies — Balance of species — Competition — Measurement of diversity — Applications of the LOG-Series and the LOG-Normal distribution

- 185) 1943: (With R.A. FISHER and A.S. CORBET) The relation between the number of species and the number of individuals in a random sample of an animal population. — *Journ. Anim. Ecol.* **12**: 44-53
- 186) Area and number of species. — *Nature* **152**: 264-266
- 187) 1944: The number of publications written by biologists. — *Ann. Eugenics* **12**: 143-146
- 188) Some applications of the logarithmic series and the Index of Diversity to ecological problems. — *Journ. Ecol.* **32**: 1-44
- 189) 1945: The Index of Diversity as applied to ecological problems. — *Nature* **155**: 390-391
- 190) Recent light trap catches of Lepidoptera in U.S.A. analysed in relation to the logarithmic series and the index of diversity. — *Ann. Ent. Soc. America* **38**: 357-364
- 191) 1946: Yule's „Characteristic“ and the „Index of Diversity“. — *Nature* **157**: 482

- 192) 1947: A diagrammatic method of analysing the relationships of the fauna or flora of several different localities. — Proc. Linn. Soc. London **158**: 99-103
- 193) The logarithmic series and the comparison of island floras. — Proc. Linn. Soc. London **158**: 104-108
- 194) The generic relationships of species in small ecological communities. — Journ. Anim. Ecology **16**: 11-18
- 195) The logarithmic series and its application to biological problems. — Journ. Ecology **34**: 255-272
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ULF EITSCHBERGER

**Neugruppierung und Einteilung der Wanderfalter
für den europäischen Bereich 1)**

von

ULF EITSCHBERGER und HARTMUT STEINIGER

Seit dem Erscheinen unseres „Aufruf zur internationalen Zusammenarbeit an der Erforschung des Wanderphänomens bei den Insekten“ (EITSCHBERGER & STEINIGER, 1973) haben sich neue Ergebnisse und Erkenntnisse herauskristallisiert, die eine Neugruppierung und Einteilung der Wanderfalter erforderlich machen.

Die Kapitel

Wie sind Wanderfalter zu erkennen?

Wie sieht eine wirkungsvolle Mitarbeit aus?

Welche Punkte kann eine Meldung beinhalten?

Wie wird markiert?

bleiben hier unberücksichtigt, da sich keine Änderungen ergeben haben. Die Antworten auf diese Fragen können der Atalanta 4, Heft 3, entnommen werden. Es sei hier nur kurz vermerkt, daß die alten Markierungsetiketten mit der Aufschrift „Send to DFZS, D-8702 Lengfeld“ so lange weiter Verwendung finden, bis der Vorrat an diesen aufgebraucht ist.

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Gruppe I: SAISONWANDERER 1. Ordnung

Definition: Arten, die alljährlich zu bestimmten Zeiten ihre Ursprungsgebiete verlassen (emigrieren) und aktiv andere Gebiete (das Ziel liegt von vornherein fest) aufsuchen (immigrieren), um dort Nachkommen zu erzeugen. Die Nachkommen wandern anschließend in die Ursprungsgebiete zurück, um dort ebenso für Nachkommenschaft zu sorgen.