

IOBC Global honorary and posthumous honorary members

At the 50th anniversary of IOBC Global honorary memberships were awarded to persons who have played an important role in the history of IOBC and biological control. They are listed below and on the following pages you may find a short biography of each of the honoured biological control scientists.

Prof.dr. Alfred S. Balachowsky, France (2008)
Dr. Emile Biliotti, France (2008)
Dr. Ernst F. Boller, Switzerland (2008)
Prof.dr. Paul H. DeBach, United States of America (2008)
Prof.dr. Vittorio L. Delucchi, Switzerland (1996)
Prof.dr. Jost M. Franz, Germany (2008)
Dr. Pierre Grison, France (2008)
Prof.dr. Ken S. Hagen, United States of America (2008)
Dr. Peter Harris, Canada (2008)
Prof.dr. Yoshimi Hirose (2008)
Prof.dr. Carl B. Huffaker, United States of America (2008)
Prof.dr. Li-Ying Li, China (2008)
Prof.dr. Jerzy J. Lipa, Poland (2008)
Prof.dr. Robert F. Luck, United States of America (2005)
Dr. Peter Neuenschwander, Switzerland (2008)
Prof.dr Stefan K. Pruszyński, Poland (2008)
Prof.dr. Filippo Silvestri, Italy (2008)
Dr. Frank Wilson, Australia (2008)
Prof.dr. Keizo Yasumatsu, Japan (2008)
Prof.dr. Miguel C. Zapater, Argentina (2008)

Prof.dr. Alfred S. Balachowsky (1901-1983, France)



At the 8th International Congress of Entomology in 1948 Stockholm, 11 specialists of biological control met under the auspices of IUBS (International Union of Biological Sciences) and with the financial support of UNESCO. They discussed possibilities to establish an organisation able to coordinate biological control activities on an international basis. This important meeting is well documented (IUBS, 1949. *Les bases scientifiques d'une organisation internationale pour la lutte biologique. Proceedings of a meeting held 5 – 7 August, 1948 at Stockholm. IUBS Series B (Colloques) No. 5, 142 pp.*). Present at this meeting were M. André (France), A.S. Balachowsky (France), Ch. Ferrière (Switzerland), J. Ghesquière (Belgium, Congo), D. Miller (New Zealand); A.J. Nicholson (Australia), S. Novicky (Austria), L.O. Parker (USA), F. Silvestri (Italy), O.H. Trägårdh (Sweden) and P. Vayssière (France, Secretary General of IUBS). After examination and analysis of the

international situation of biological control, the group formulated a resolution addressed to UNESCO with the goal of forming an international organization dealing with biological control. The intention of the group was described in the resolution as follows: *“The proposed international organisation is viewed as an extension to other countries of the kind of work already being carried out by the United States of America and the British Commonwealth. This organisation should work in co-operation with all institutes and individuals actively carrying out biological control work”*.

The participants of the Stockholm group, in which Dr. Balachowsky played a key role, recommended in their resolution *“that international action can and should begin at once, by setting up an organisation providing the following services”*:

- A documentation service for the collection of pertinent information
- A taxonomic service dealing with the identification of natural enemies
- A survey service to study the natural enemies existing in the major regions of interest
- An application service devoted to collecting, breeding, transporting, acclimatising and establishing natural enemies in regions where local institutions are unable to undertake this work themselves.

IUBS decided to support the establishment of a “Commission Internationale de Lutte Biologique (CIBC) as part of the IUBS Division of Animal Biology. A first *ad hoc* committee (“Commission pour les recherches sur la lutte biologique”) was established in Menton, France and it started the detailed planning of the organization. Preparatory meetings were held with government representatives, experts and potential members of the future organisation in Madrid (1951), Jouy-en-Josas, Geneva and Portici (1953), Colmar (1954) and Zürich (1955). A group consisting of representatives from France, Switzerland and Germany produced the final draft of the statutes and organized the first meeting of the organization in 1956.

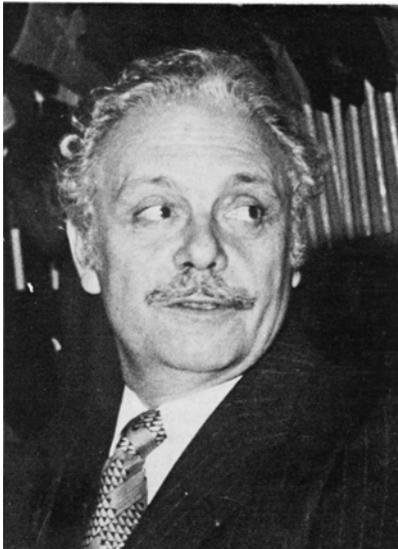
Alfred Serge Balachowsky (15 August 1901, Karotcha /Kursk - 1983 Paris) was a French entomologist born in Russia. He specialised in Homoptera: Coccoidea, but also worked on Coleoptera. Dr. Balachowsky worked at the Muséum national d'histoire naturelle. In 1948 he was elected president of the Société entomologique de France.

Dr Balachowsky was one of the founding members of IOBC and served as president from the initiation of IOBC in 1956 for many years. In 1968, he resigned and was replaced by Dr. Biliotti.

Selected publications by Balachowsky

- Balachowsky, A.S. 1932. Etude biologique des coccidies du bassin occidental de la Méditerranée. PhD Thesis.
- Balachowsky, A.S. & L. Mesnil. 1949. Les insectes nuisibles aux plantes cultivées. Leurs moeurs. Leur destruction. Traité d'entomologie agricole concernant la France, la Corse, l'Afrique du Nord et les régions limitrophes. Tom 1. 1137 pp. Paris. Faune de France, Volume 50: Coléoptères Scolytides 320 pages, 300 b/w line illus.
- Balachowsky, A.S. 1951. La lutte contre les insectes: principes, methodes, applications. Payot, Paris, 380 pp.
- Balachowsky, A.S. 1954. Les cochenilles paléarctiques de la tribu des Diaspidini. Institut Pasteur, Paris.
- Balachowsky, A.S. 1956. La Commission internationale de lutte biologique contre les ennemis des cultures. Buts, fonctionnement et statuts. *Entomophaga* 1: 5-18.
- Balachowsky, A.S. 1963. Entomologie appliquée à l'agriculture. Traité. Tome I. Coléoptères. Maison et Cie Éditeurs, Paris, 1391 pp.
- Balachowsky, A.S. & J. D'Aguilar. 1972. Lepidoptères. Masson et Cie, Paris.

Dr. Emile Biliotti (1925-1978, France)



Emile Biliotti was a man of prodigious intelligence and exceptionally dynamic and generous. These qualities, which were already apparent at the Toulon Lycee where he excelled, made him a student of particular promise at the National Institute of Agronomy in Paris. His aptitude for the biological sciences subsequently determined the orientation of his career towards phytosanitary research, and his entry in 1947 to the National Institute of Agronomic Research (INRA).

His first studies concerned forest biocoenoses and, more particularly, the pine and oak procession moths, two important pests in the Mediterranean Basin. These investigations are reported in 24 publications, which comprise specific studies of parasitoid complexes, especially tachinid flies. The quality of these publications came to the attention of his superiors, particularly since he endeavoured to elucidate the complicated mechanisms governing population dynamics, thus aligning with the ecological approaches recommended by IOBC.

Together, his gifts as a researcher and organizer led to rapid promotion in INRA, and increased recognition at the international level. Following his appointment as assistant in 1948, he became Chargé de Recherches in 1957, Director of the Station of Zoology and Biological Control at Antibes, as well as Maître de Recherches in 1961, Director of Research, and in 1963, Director of the Agronomic Research Centre at Antibes. The following major publications date from this period: *Phoracantha semipunctata* on Eucalyptus, possibilities of using *Doryphorophaga doryphorae*, *Elatophilus nigricornis* on maritime pine, and *Phanerotoma flavitestacea* antagonists of *Ectomyelois ceratoniae*. Numerous, more general studies are of considerable value in defining themes of attaining the different objectives of the Centre. His enthusiastic leadership resulted in expansion of the Antibes station and growing prestige of France in the field of biological and integrated control. Within INRA, he moved from Antibes to Versailles where he became Director of the Central Zoology Department and Head of the INRA Zoology Department. Six years later, he assumed the highest office in phytosanitary France in his capacity as Inspector-General of Agronomic Research. He clearly defined the options to adopt within the framework of modern plant protection in a lecture addressing the Commission of the European Communities in 1975. He was involved in many organizations, such as President of the Zoological Society of France, the Entomological Society of France, member of the Standing Committee for International Plant Protection Congresses, member of the International Entomology Congresses and member of the Panel of Experts on Integrated Control. He was Chevalier de la Légion d'Honneur, Officier du Mérite Agricole and Officier des Palmes Académiques.

Because of his deep interest in IOBC, he was appointed President in 1968, a post which he occupied until 1977 (IOBC WPRS), after which he was appointed President of IOBC Global.

The summary is made by Joop van Lenteren is based on an article written by G. Mathys, 1978, Newsletter IOBC Global No. 10, 1-2.

Selected publications by Biliotti

Biliotti, E. 1956. Entomophages et maladies des insectes. *Entomophaga* 1, 45-53.

- Biliotti, E. 1956. Mise au point d'une méthode de lutte biologique utilisant des suspensions de spores de *Bacillus*. *Entomophaga*.
- Biliotti, E. 1956. Biologie de *Phryxe caudata* Rondani [Dipt. Larvaevoridae] parasite de la chenille processionnaire. *Rev. Pathol. Veg. Entomol. Agric. France*.
- Biliotti, E. 1958. Les parasites et prédateurs de *Thaumetopoea pityocampa* Schiff. (Lepidoptera). *Entomophaga*.
- Biliotti, E. and P. Delanoue. 1959. Contribution à l'étude biologique d'*Opius concolor* Szep. (Hym. Braconidae) en élevage de laboratoire. *Entomophaga* 4, 7-14.
- Biliotti, E. 1961. Les problèmes de systématique dans les recherches écologiques sur les insectes entomophages. *Entomophaga*.
- Biliotti, E. 1961. La lutte biologique contre les insectes ravageurs Université de Paris, Palais de la découverte, Paris.
- Biliotti, E. 1971. Ecology, basis and support of biological control. General introduction. *Ann. Parasitol. Hum. Comp.* 46, Suppl. 5-10.

Dr. E.F. Boller (1938, Switzerland)



Dr Ernst F. Boller studied at the Faculty of Agronomy, Swiss Federal Institute of Technology, Zürich from 1958-1962. He did his PhD research at the Swiss Federal Research Station for Arboriculture, Viticulture and Horticulture at Wädenswil under the supervision of Prof. P. Bovey from 1962-1966. During this period, he was appointed as junior entomologist and PhD. student, and was responsible for fruit fly research and small fruit entomology. After obtaining his PhD degree at the Swiss Federal Institute of Technology (Entomology) (ETHZ), he worked from 1966-1968 as Post-doctoral fellow of the Canadian Research Council and worked at the CDA Research Institute for Biological Control at Belleville, Ontario (B.S. Beirne, Prof. M. Mackauer, Dr H. House) and CDA Research Stations at Vancouver, BC and Summerland, BC (Dr J. Proverbs).

In 1968 he returned to the Swiss Federal Research Station for Arboriculture, Viticulture and Horticulture, Wädenswil, where he worked as senior entomologist on fruit fly research and grape entomology. From 1985-1999 he participated in and was project leader of the development of the interdisciplinary program "Integrated Production in Viticulture". From 1989-1998 he was president of the coordinating committee of the Swiss Federal Office of Agriculture for the preparation of direct payments for sustainable agriculture. He was appointed Head of the Department of Zoology and Weed Science, Swiss Federal Research Station for Arboriculture, Viticulture and Horticulture, Wädenswil in 1991, Deputy Director in 1994, Head Service Center and Strategic Planning in 1999, and retired from Federal Government services and ETH Zürich in 2001. Dr Boller published more than 200 scientific papers and book chapters.

During his appointment in Wädenswil, Dr Boller obtained the following two extra degrees at the ETH in Zürich: PD (Private Lecturer with *venia legendi*); Habilitation at ETHZ (Faculty of Agronomy, Institute of Phytomedicine, Prof. V. Delucchi). He was teaching an interdisciplinary course "Case histories in plant protection" at ETHZ from 1982 to 2001. From 1974 to 1994 he was giving courses on "special topics in plant protection and integrated production in viticulture" at the Agricultural College for Arboriculture, Viticulture and Horticulture in Wädenswil. From 1996 to 2001 he was guest lecturer at the University of Milano where he taught Integrated Plant Protection and Production. In addition, he was a participant in several IAEA/FAO expert panels on fruit flies and was holding research agreements with that agency. He was visiting FAO expert in Greece for Olive fly projects on Crete.

During most of his career, Dr Boller has been very active in IOBC. He was founding Member of the IOBC/WPRS Commission on "Integrated Production Guidelines and Certification" 1990-2006, founding Convenor of IOBC/WPRS Working Group on "Genetic Control of *Rhagoletis cerasi*" 1968-1978, founding President and member of the IOBC/WPRS Working Group on "Fruit Flies of Economic Importance" 1978-1998, founding member and co-ordinator of the Global IOBC Working Group on "Fruit Flies of Economic Importance" 1986-1990, founding President of the Global IOBC Working Group "Quality Control in Mass Reared Arthropods", member of the IOBC/WPRS Working Group on "Side effects of pesticides on beneficial organisms", member of the IOBC/WPRS Working Group on "Integrated protection in viticulture", and member of the IOBC/WPRS Council 1981-1985. In appreciation of all his work for IOBC, Dr Boller received an honorary membership of the West Palaearctic Regional Section in 2005.

Selected publications by E.F. Boller:

- Boller, E.F. & Prokopy, R.J. 1976. Bionomics and management of *Rhagoletis cerasi* L. *Ann. Rev. Entomol.* 21: 223-246.
- Boller, E.F., Russ, K., Vallo, V. & Bush, G.L. 1976. Incompatible races of European cherry fruit fly, *Rhagoletis cerasi* L. (Diptera: Tephritidae), their origin and potential use in biological control. *Ent. exp. et appl.* 20: 237-247.
- Boller, E.F. & Chambers, D.L. 1977. Quality of mass-reared insects. *In*: "Biological control of insects by augmentation of natural enemies". (eds R.L. Ridgway & S.B. Vinson). Plenum Press, New York. pp. 219-236.
- Boller, E.F. & Hurter, J. 1985. Oviposition deterring pheromone in *Rhagoletis cerasi* L.: Behavioral laboratory test to measure pheromone activity. *Ent. exp. et appl.* 39: 163-169.
- Boller, E.F., Remund, U. & Candolfi, M.P. 1988. Hedges as potential sources of *Typhlodromus pyri* - the most important predatory mite in vineyards of Northern Switzerland. *Entomophaga* 33: 15-22.
- Boller, E. & Aluja, M. 1992. Oviposition deterring pheromone in *Rhagoletis cerasi* L.: Biological activity of four synthetic isomers and HMP discrimination of two host races as measured by an improved laboratory bioassay. *Z. ang. Entomol.* 113: 113-119.
- Boller, E.F., Hippe, C., Prokopy, R.J. et al. 1994. Response of wild and laboratory reared *Ceratitis capitata* Wied. (Dipt., Tephritidae) flies from different geographic origins to a standard host marking pheromone solution. *J. Appl. Ent.* 118: 84-91.
- Boller, E.F., Gut, D. & Remund, U. 1997. Biodiversity in three trophic levels of the vineyard agro-ecosystem in Northern Switzerland. pp. 200-318 *In*: "Vertical food web interactions: Evolutionary patterns and driving forces" (eds K. Dettner, G. Bauer & W. Völkl). Springer Publishing.
- Boller, E.F. 2001. The IOBC position with respect to food labels and Integrated Production of Vegetables. pp. 57-60. *In*: Proceedings VEGINECO Workshop 20- 21 June 2001, Amsterdam, 115 pp.
- Boller, E.F., Häni, F. & Poehling, H.M. 2004. "Ecological Infrastructures: Ideabook on Functional Biodiversity at the Farm Level". ISBN 3-906776-07-7, 226 pp.

Prof.dr. Paul H. DeBach (1914 – 1992, USA)



Paul Hevener DeBach studied first at UCLA and later at UCB where he majored in entomology and received a B.A. in 1938. He then began graduate studies and worked with Harry Schott Smith at the Citrus Experiment Station in Riverside. Paul was awarded his PhD in 1940, with a major in biological control.

Paul's first appointment was with the U.S. Public Health Service (1942-1943) as a junior entomologist involved in malaria control. Subsequently, he worked with the USDA (1943-1945) in Gulfport, Mississippi, on control of the white fringed beetle. Immediately following World War II, Paul was appointed an assistant entomologist with the Department of Biological Control at the Citrus Experiment Station. He remained with the CES throughout his career, retiring in 1983 as professor and entomologist, twice over scale.

Paul DeBach was responsible for developing the first formal courses offered in biological control at UCR. With the aid of NSF and Ford Foundation grants, he attracted many graduate students to UCR during the 1960s and 1970s. These former students and postdoctoral fellows have become nationally and internationally prominent in biological control and entomology. Many of them have established courses in the field at their universities, thereby extending the philosophy and approach to biological control that was espoused by Paul DeBach.

Paul's teaching accomplishments were noteworthy, but his leading contribution lay in scientific research. Over a career of more than forty years, he wrote 200 papers and four books. His practical interests involved the control of citrus pests, particularly scale insects, whiteflies, and mealybugs. His theoretical interests involved principles of biological control, including systematics of parasitic hymenoptera and the ecology of host-parasite interactions. As a member of the Citrus Experiment Station, Paul DeBach engaged in extensive foreign exploration for natural enemies of citrus pests occurring in California. A guiding principle in the field is that pests become a problem when they migrate from their home of origin and escape their natural enemies. Paul's work culminated in the establishment of many species of predaceous beetles and parasitic wasps that were important in the control of several pests of citrus, including California red scale. He also imported other species of parasitic wasps that were responsible for control of olive scale. His last outstanding success, during the mid-1970s, involved using parasitic wasps to control the woolly whitefly in southern California. His importation of natural enemies has resulted in millions of dollars of annual savings in reduced pesticide application by California agriculture. The savings is greater when viewed on a global scale because many of the natural enemies field-tested in California were moved elsewhere. Countries receiving natural enemies from DeBach included Australia, Spain, Italy, Greece, Israel, South Africa, Mexico, Peru, Chile, Brazil, and Japan.

Early in his career, Paul recognized the importance of correctly identifying the zoological entities with which he worked. Correct scientific names are essential when reporting the results of applied biological control and ecological research. At the time Paul worked, too few taxonomic specialists were available to provide authoritative, timely taxonomic identifications. Thus, Paul was compelled to personally solve many taxonomic problems encountered in his biological control work. His taxonomic interests in biological control focused on parasitic wasps that are important natural enemies of scale insects, mealybugs, and whiteflies. His research, combined with the work of graduate students, foreign colleagues, and staff research associates pointed to the existence of numerous sibling

species and cryptic-species complexes among parasitic wasps that attack these pests. His work in this area culminated in the 1979 monograph on the genus *Aphytis*, for which he was co-recipient of the first Filippo Silvestri Prize for original research in biological control.

Paul was adroit at identifying the basic nature of seemingly complex problems and providing elegantly simple solutions for them. For instance, he was responsible for pioneering work in the “check method” that is used throughout the world to evaluate the effectiveness of natural enemies. Earlier workers had no methodology for qualitatively or quantitatively assessing the efficiency of natural enemies. Paul also worked extensively in ecological principles such as “competitive displacement.” Before his work, this was a little-studied aspect of ecology, and one whose importance went unnoticed by most biological control workers. DeBach's work on competitive displacement and so-called ecological homologues is noteworthy because his research stimulated substantial research by other workers. Finally, at the time of his retirement, DeBach was actively engaged in artificial selection research aimed at improving the efficiency and performance of parasitic wasps.

Paul was a member of many professional societies and served on many national and international society boards. In such positions he fostered worldwide interest in and implementation of biological control. He was responsible, with C.B. Huffaker, for developing the UC International Center for Biological Control, which encouraged the training of students from underdeveloped countries. Also, Paul was a key figure in developing the Integrated Pest Management Program under the International Biological Program. This program was designed to develop pest management strategies with minimal reliance on conventional pesticides. Nineteen universities and the U.S. Department of Agriculture participated in this program. Paul also served as president of the International Organization for Biological Control in 1971.

Paul was the principal editor of *Biological Control of Insect Pests and Weeds* and author of key chapters in this book. Published in 1964, the book is the bible of biological control and has been translated into Russian and Spanish. Paul also published *Biological Control by Natural Enemies* (1974), a popular work whose second edition came out in 1991. He published more than 200 scientific papers.

Paul was the recipient of numerous national and international awards. Some of these were the Rockefeller Fellowship (Brazil 1962); Fulbright Senior Research Scientist (Greece 1963); Honorary Foreign Member, Entomological Society of the USSR (1973); and C.W. Woodworth Award for Scientific Achievement, Entomological Society of America (1977). (Gordon Gordh, Carl B. Huffaker & Robert F. Luck, 1992; slightly shortened by Joop C. van Lenteren, 2006)

Key publications of Paul DeBach

DeBach, P. 1951. The necessity for an ecological approach to pest control on citrus in California. *J. Econ. Ent.* 44, 443-447.

DeBach, P. and R.A. Sundby. 1963. Competitive displacement between ecological homologues. *Hilgardia* 34, 105-199.

DeBach, P. (ed.) 1964. *Biological Control of Insect Pests and Weeds*. Cambridge University Press, Cambridge, 844 pp.

DeBach, P. and K.S. Hagen. 1964. Manipulation of entomophagous species. *In*: P. DeBach (ed.), *Biological Control of Insect Pests and Weeds*. Cambridge University Press, Cambridge, pp. 429-458.

DeBach, P. 1966. The competitive displacement and coexistence principles. *Annual Review of Entomology* 11, 183-212.

DeBach, P. 1974. *Biological control by natural enemies*. Cambridge University Press, Cambridge, 323 pp.

- DeBach, P. 1976. The Aphytis story: an illustration of principles and practice in biological control. 25th Annual Faculty Research Lecture University of California at Riverside, 23 pp.
- DeBach, P., C.B. Huffaker and A.W. MacPhee. 1976. Evaluation of the impact of natural enemies. Chapter 11 *In*: C.B. Huffaker & P.S. Messenger (eds.), Theory and Practice of Biological Control. Academic Press, New York, pp. 255-285.
- DeBach, P. and D. Rosen. 1991. Biological control by natural enemies, 2nd edition. Cambridge University Press, Cambridge, 440 pp.
- Rosen, D. and P. DeBach. 1979. Species of Aphytis of the World (Hymenoptera: Aphelinidae). W. Junk, The Hague, 801 pp.

Prof.dr. V.L. Delucchi (1925, Switzerland)



Vittorio L. Delucchi attended the Faculty of agronomy and food sciences, Swiss Federal Institute of Technology (SFIT), Zurich from 1945 to 1949, and obtained his PhD in 1953. In 1949 he was appointed as a research officer with the Commonwealth Institute of Biological Control (CIBC), now International Institute of Biological Control (IIBC) and worked for 10 years on biological control projects, collecting and mass rearing parasitoids and predators from Sweden to southern Italy, and shipping them to Canada, Australia, and New Zealand for biological control of agricultural and forestry pests introduced from Europe.

From 1959-1963 he worked as an FAO expert in Morocco, mainly preparing the basis for the introduction of parasitoids against the citrus red scale *Aonidiella aurantii* and of Sunn pest, *Aelia* sp. After a short period of activity at the SFIT, he returned to FAO in 1965, where he was in charge of the entomology section at its headquarters in Rome. Besides the supervision of projects financed by FAO and the organization of international meetings and conferences, part of the time was devoted to the internationalization of the IPM concept with the collaboration of the Californians Ray Smith and Hal Reynolds.

In 1968 he was appointed as Professor of Entomology by SFIT, Zurich, where he remained until his retirement in 1990. He was teaching entomology and crop protection and supervised the research of 52 PhD candidates (10 of them in tropical or subtropical countries) and many Masters degree students. His research focused mainly on agroecosystems, with particular reference to preventative methods of pest control and the importance of native parasitoids and predators of pests. He was Dean of the Faculty of Agronomy and Food Sciences (1976-78), in charge of the Department of Entomology (1972-81), of the Department of Phytomedicine (1981-87) after merging with the Department of Phytopathology, and of the Department of Plant Sciences (1987-90) after merging with the Department of Crop Production. He was also member and chairman of the commission of the National Fund for Scientific Research for the Italian-speaking part of Switzerland (1977-87).

Outside SFIT, he organized and supervised several research projects, among them the Greek project on IPM in olives groves of Crete on behalf of FAO and financed by UNDP (1969-80), a project on IPM in rice in the Lake Alaotra region of Madagascar (1983-92), and on potato tuber moth in Tunisia (1986-90) financed by the Swiss Development and Cooperation agency, a project on IPM in cotton in Gezira, Sudan (1977-80), and on the citrus pest *Cryptophlebia leucotreta* in the Republic of Bénin (1974-76). He was chairman of the Expert Advisory Committee for Biological Control, a member of the Board of Trustees of the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria (1983-93) and carried out missions in Lebanon (1963-64), São Tomé (1970), Republic of Congo (1971), Paraguay (1989-90) and Bolivia (1991).

He participated in the activity of several international organizations. First of all in IOBC, of which he was a member of the first executive bureau (1956) in charge of the secretariat of the identification service and of the documentation on parasitoid taxonomy, later on Secretary General (1968-76), Treasurer (1976-80), and President (1984-88). In 1968 he was appointed as a member of the International Biological Programme (IBP), Use and Management of Natural Resources section and became chairman of the working group on

Biological Control (1968-76). He was also a member and later chairman of the FAO panel on Integrated Pest Management (1969-78).
(V.L. Delucchi, 2006; slightly shortened by Joop van Lenteren, November 2006)

Publications:

> 170 scientific papers in books and journals; examples:

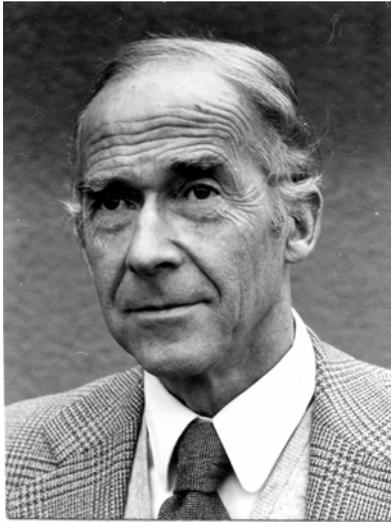
Delucchi, V.L. & H. Chapot, 1963. Maladies, troubles et ravageurs des agrumes au Maroc, INRAM, 339 pp.

Delucchi, V.L. & G. Remaudière, 1966-1971. Index of entomophagous insects, 6 volumes, Le François, Paris

Delucchi, V.L. (Ed.), 1976. Studies in Biological Control, IBP vol. 9, Cambridge University Press, 304 pp.

Delucchi, V.L. (Ed.), 1987. Integrated pest management: quo vadis?, Parasitis, Geneva, 411 pp.

Prof.dr. Jost M. Franz (1915-1994, Germany)



Jost Martin Franz was born in Dresden in 1915, went to Gymnasium in Würzburg and Königsberg and studied Zoologie, Botanik and Physiologie at the universities of Königsberg, München and Freiburg. His PhD research was on the biology and ecology of *Choristoneura (Cacoecia) murinana* (Hb.), a pest of fir trees, and he obtained his degree in 1940. Next he worked as assistant and scientific assistant of Prof.dr. H. Zwölfer at the Institute of Applied Zoology in München. When young, Prof. Franz was an enthusiastic ornithologist, published various articles in this area and was a member of several boards for bird study and bird protection. His dissertation was of great interest to Canadian forest entomologists, who were looking for natural enemies of the related Canadian *Choristoneura* species. This brought Prof.

Franz in contact with the Commonwealth Institute of Biological Control (CIBC), which would have great influence on his future career. He worked for a while at the European station of CIBC and was leader of the German substation from 1949 till 1953.

In 1953, he was employed by a government institute in Darmstadt, which was initially called “Institute for the study and control of the Colorado Potato Beetle”, and was renamed in 1955 as “Institute for Biological Control”. With great energy he established research on biological control, a new field of research and application for Germany. His specialization was population dynamics and reduction of population densities of damaging insects by natural enemies. He employed several researchers, also in the field of insect pathogens, and he established a diagnostic service for insect diseases. Soon, the Darmstadt institute was well known and respected for its work worldwide. On the 20th anniversary of the institute in 1973, a brand new building was inaugurated. During this period, the first applications of several insect pathogens (e.g. *Bacillus thuringiensis*) and parasitoids (e.g. *Trichogramma* spp.) were realized in Germany.

Later, Prof. Franz invested much energy in the study of integrated plant protection (IPM) methods. In order to be able to use natural enemies in IPM programs, he thought it essential to know the side effects of pesticides on natural enemies. Thus, he developed a number of tests and formed an IOBC working group to be able to evaluate the effects of pesticides in different countries and crops. Some of these tests are now used in the European Community testing programme for legislation of pesticides.

In 1958 he was teaching Applied Entomology at the Technical University of Darmstadt, and he obtained an honorary professorship at the same university in the Department of Biology in 1965, where he was teaching biological control and ecology. He supervised a number of MSc and PhD students.

Prof. Franz gave more than 200 lectures about biological control and IPM in German, French and English, and published more than 200 scientific papers and chapters in books. He wrote a handbook on biological control in German, which was reprinted and updated several times, and edited other books. He was a member of a number of professional organizations in the field of biological control and entomology, such as Member of the Permanent Commission of the International Plant Protection Congress and Member of the Panel of Experts on Integrated Pest Control of FAO. He travelled extensively, spent several sabbaticals in the USA and visited China in 1979 as a guest of the Chinese Academy.

Prof. Franz played an important role during the establishment of IOBC in the 1950s and fulfilled several tasks, including Vice President (1956-1968), Convenor of the

Documentation Service of IOBC (1956-1968), Convenor of the Working Group on Biological Control of the Colorado Potato Beetle (1957-1968), Council Member of IOBC WPRS (1977-1980), and Founder and Convenor of the Working Group on Side Effects of Pesticides on Natural Enemies (1974-1979).

Prof. Franz received many awards, among others the Harry Scott Smith Memorial Award of the University of California, Riverside, USA (1962), Medaille in Gold of the Fondazione Filippo Silvestri, Naples, Italy (1965), Heinrich Cotta Award of the Faculty of Forest Studies, Technical University, Dresden, Germany (1966), and he was appointed "Officier du Mérite Agricole" by the French Minister of Agriculture in 1970.

The summary is made by Joop van Lenteren and is based on an article written by A. Krieg, 1980, in *Nachrichtenbl. Deut. Pflanzenschutzd* (Braunschweig), 32: 62-63.

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Dr. Pierre Grison (1912-2000, France)



Pierre Grison is remembered by his French colleagues as an enormously enthusiastic and dynamic person, always full of new ideas about research and organization of entomological work in France. Since the creation of the INRA (French National Institute of Agricultural Research) in 1946, he trained many young people in the fields of zoology, entomology and biological control at the Versailles INRA station. He did not limit his work to the laboratory, but stressed the importance of field work. He used ecological principles and their application for his research approach. During the first decades of pesticide use, he kept telling his colleagues that biological control should not be neglected

and he was able to establish a laboratory studying the possibilities of pathogenic micro-organisms for biological pest control. In 1955 he left Versailles and started to work at INRA la Minière. During his career, he founded several INRA research groups and laboratories, was a member of many committees of the French National Scientific Organization (CNRS), was president of the Ecological Society, founded an organization for amateur and professional entomologists (OPIE) and was a member of the French Academy of Agriculture.

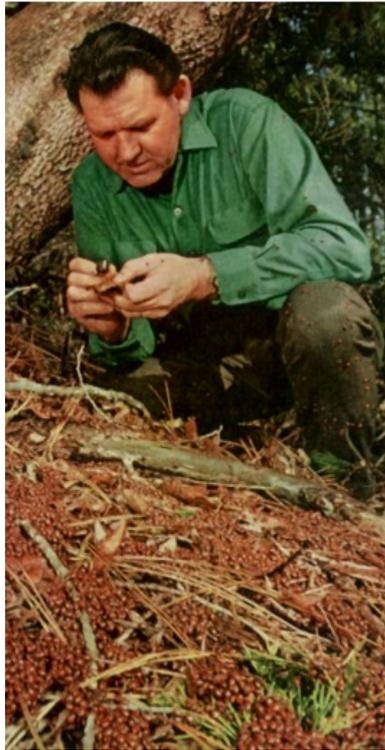
He published many papers on population dynamics of pests and natural enemies in orchards and forests, on the use of *Bacillus thuringiensis* in IPM programs, and he wrote a history of agricultural zoology in France (*Chronique historique de la zoologie agricole Française*, INRA, 1992).

Dr. Grison played an active role in the creation of IOBC. He was the first Secretary General (1956-1965), and produced Entomophaga (now BioControl) for a long period. (This summary is made by Joop van Lenteren based on an article by G. Ricou.)

Selected publications by P. Grison

- Grison P., M. Feron, and K. Sacantanis. 1950. Développement de la Mouche des fruits *Ceratitis capitata* (Wied.) en milieu nutritif synthétique. C.R. Acad. Sci., 231, 996–998.
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Prof.dr. Ken S. Hagen (1919 –1997, USA)



Kenneth Sverre Hagen attended U.C. Berkeley, where he earned his BS in entomology in 1943. After serving for several years in the US Navy, Ken came back to California and was hired as the supervising entomologist for the Pest Control Association in California's Central Valley in 1946, becoming the first supervised control entomologist in California. This position played a key role in the development of integrated pest management. Ken then returned to Berkeley as a graduate student, working as a technician in the Division of Biological Control. He received his MS there in 1948, and his PhD in 1952, under the direction of Richard Doutt. This was a particularly rich time to be at Berkeley, as Ken studied under such luminaries as Essig, Linsley, Usinger and Michelbacher, and worked under Harry Scott Smith. He was appointed Junior Entomologist in the Division of Biological Control, Agricultural Experiment Station (at the Gill Tract in Albany, California) in 1952, advanced to Entomologist in 1965, and to Professor of Entomology in 1969. He officially retired in 1990, but continued to work at the Gill Tract until the day of his death.

Ken was involved in the importation of the natural enemies of pear psylla, acacia psyllid, spotted and blue alfalfa aphids, pea aphid, walnut aphid, plum aphid and other pest insects. However, it was in the area of augmentation of natural enemies, coupled with insect nutrition, that Ken made his most important contributions to science. He was the first to develop an "artificial egg" for the mass-rearing of *Chrysoperla*, and also helped develop artificial diets for coccinellids. His innovative work on food sprays for predators was a major breakthrough in augmentation of field populations of aphidophaga. Ken considered that his most significant research contribution was presented in a paper wherein he hypothesized that the occurrence of amino acids in honeydew helped protect honeydew producers from ant predation, and presented data showing that chrysopids were attracted to a combination of plant volatiles and kairomones from honeydew.

Ken was truly a scientist of international stature and experience. He engaged in collaborative research in Mexico, Central America, Brazil, Greece, Kenya and China, but his travels also extended through Europe to India, Malaysia, Australia, New Zealand and China. Of the 22 visiting scientists and postdocs he hosted in his lab, 18 were from other countries, and of the 28 graduate students he supervised, eight were from abroad.

Ken's work with the Coccinellidae included documenting the complex migratory behaviour of *Hippodamia convergens*, which involved the use of hot air balloons and scoops fitted onto fixed wing aircraft to sample airborne beetles. This work led to an article in the National Geographic (1970; see the photograph), entitled "Following the ladybug home".

Ken published more than 150 scientific papers, and contributed a number of chapters to various books on biological control and ecology.

Ken was a member of many entomological societies in the USA, Society of Systematic Zoology, American Association for the Advancement of Science (Fellow), American Institute of Biological Sciences, International Society of Hymenopterists, and the International Organization for Biological Control (President 1980-1984). He was honoured at the 1989 national meeting of the Entomological Society of America with a symposium

entitled "Native and Introduced Predaceous Coccinellidae: A Tribute to Kenneth S. Hagen for His Contributions to Coccinellid Biology". In 1990 he was awarded the Berkely Citation by the University of California, Berkeley for outstanding service to the University. In 1992 and 1993 he received the Distinguished Service Awards by the Association of Applied Insect Ecologists, Hawaiian Entomological Society and Pacific Coast Entomological Society. In 1995, the International Organisation of Biological Control presented Ken with the Distinguished Biological Control Science Award, and he presented an invitational talk on the Chemical Ecology of Chrysopidae at the IOBC conference honouring him.

Irrespective of these many scientific honours, Ken Hagen was probably best known among his colleagues for several personal traits. First, he always kept a pot of coffee going in his lab, and this served as a focal point for staff and visitors to drop in and discuss entomology. Second, he had a virtual encyclopaedic knowledge of entomology and biological control. It was generally understood that if you had a question, your first stop should be Hagen's office. Finally, he was extremely generous with his time and knowledge. No matter who approached him, Ken would be happy to lay aside whatever he was working on, and give that person his full attention until he got the answer, or could refer the person to the correct authority.

Outside of entomology, Ken's greatest interest was book collecting. His book and journal collection eventually outgrew his house, and when the house next to his came up for sale, Ken and Maxine ended up buying it, largely to use the garage as a storage space for his overflowing library.

A tireless researcher, a loyal and dedicated member of the University of California faculty, an enthusiastic teacher, a helpful and stimulating colleague, and a generous human being, Ken Hagen was, in every sense of the word, a true gentleman.

(R.L. Zuparko, 2002, *Pan-Pac. Entomol.* 78: 151-167; shortened by Joop van Lenteren, 2006).

Key publications K.S. Hagen

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Dr P. Harris (1930, UK)



Dr Peter Harris obtained his BSc in Forestry from the University of British Columbia (Canada) in 1955, his Diploma of Imperial College (DIC)(London, UK) in 1958 and his PhD in Entomology at the University of London (UK) also in 1958. He was employed by the Canada Department of Agriculture (later Agriculture Canada) in Belleville, Ontario in 1959, where he served as Research Officer, Research Scientist and Acting Director. In 1972 he moved to Agriculture Canada in Regina, Saskatchewan and in 1992 he moved to Agriculture & Agri-Food Canada (AAFC) in Lethbridge, Alberta, where he is still active as Emeritus Scientist.

Dr Harris is recognized internationally as a leader in classical weed biocontrol research and has published 49 research papers (including 1 in Science and 2 in Nature), 27 reports, 16 special publications, 1 book, 24 book chapters, 31 conference proceedings and 3 reviews. His publications encompass both the theoretical and practical aspects of weed biocontrol. He played a major role in developing the protocols for assessing the safety of candidate weed biocontrol agents that became the basis of screening tests in use worldwide. In the late 1970's he conducted the first economic evaluation of the costs and benefits of weed biocontrol. His international stature is evidenced by requests to review the program of the USDA Biological Control of Weeds Laboratory (1982); to serve as Chair of the VI International Symposium on Biological Control of Weeds (1984); to review the program of the USDA Grassland, Soil and Water Research Laboratory (1990); to review a feasibility study on the use of biocontrol agents in cocoa production for the US Congress Office of Technical Assessment (1991); and to serve on the Scientific Advisory Board of the prestigious journal, *Zeitschrift für angewandte Entomologie*.

As a result of Dr Harris's efforts during his career with AAFC, the Canadian weed biocontrol program is recognized as being one of the world's most successful. He has been involved with the importation, screening, release and impact assessment of 36 insect and 1 nematode biocontrol agents. Of these, 26 have become established, an unusually high success rate, and some have proved dramatically effective. An example of his work is the introduction of the nodding thistle seed-head weevil, which reduced the status of nodding thistle in Canada from that of a major problem to one of ephemeral occurrence on disturbed sites. Subsequently, this biocontrol agent was successfully utilized by many other countries and the control of nodding thistle achieved is now recognized as being the world's third most successful weed biocontrol project in terms of impact and the area affected. He also introduced insects that significantly reduced the toxic pasture weed tansy ragwort, in both British Columbia and the Maritime provinces. As a result of these successful biocontrol efforts several provinces have removed the above weeds from their noxious weeds list. The savings in chemical and cultural control costs for these weeds and the value of the increased grazing capacity resulting from their suppression by the introduced biocontrol agents amounts to many millions of \$ annually in both the USA and Canada.

The public support for biocontrol of weeds was gained in large part by Dr Harris's willingness to give many talks and media interviews and to arrange or participate in field days. He initiated and established numerous cooperative agreements with Provinces, States, municipalities and counties for weed biocontrol activities, especially the secondary distribution of effective agents. He has also established many personally initiated international

cooperative links, which resulted in many potential biocontrol agents present or indigenous to other countries being obtained for screening or introduction at little cost.

At host expense he spent three weeks lecturing and consulting on weed biocontrol at the University of Beyreuth, Germany (1981); two months touring South Africa to advise on weed biocontrol (1982); several weeks in the USSR at the invitation of the USSR Academy of Science to advise on the biocontrol of ragweed (1986); several weeks in China as a guest lecturer under the UN Distinguished Persons (UNDP) Program to advise on biocontrol issues, including a visit to Inner Mongolia to look for potential biocontrol agents (1991). In 1994 he again visited China to advise on improving handling and shipping of biocontrol insects and to visit Xinjiang Province (NW China) to look for biocontrol agents for Canada thistle. He has also advised and lectured in Australia and Brazil.

Dr Harris has been inducted as a Fellow of the Canadian Entomological Society (1984), awarded the Commemorative Medal for the 125th Anniversary of Canadian Confederation (1994), was the recipient of a Special Award by the Canadian Forum for Biological Control (1996), a recipient of The Canadian Entomological Society Gold Medal (1997), Member of the Order of Canada (1997), and appointed Emeritus Scientist by the Federal Minister of Agriculture (1997).

(Composed from various sources by Joop van Lenteren)

Selected publications by P. Harris:

- Harris, P., Peschken, D. & Milroy, J. 1969. The status of biological control of the weed *Hypericum perforatum* in British Columbia. *The Canadian Entomologist* 38: 139-142.
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Prof.dr Y. Hirose (1936, Japan)



Prof.dr Yoshimi Hirose has been with Kyushu University (KU), Fukuoka, Japan since 1956. He obtained his PhD degree from KU in 1969 and has worked in the Institute of Biological Control, Faculty of Agriculture in KU as an assistant, associate, and full professor over 30 years, prior to his retirement in 2000. He is now Emeritus Professor at KU.

His research and teaching have focused on host-parasitoid and prey-predator interactions from the individual to the agroecosystem level. He has often been engaged in ecological and behavioral studies on egg parasitoids of various insects, having a profound knowledge of taxonomy of egg parasitoids, such as *Trichogramma* and *Telenomus*. Thus, he has contributed to development in the biological control of insect pests, such as pine moth, citrus swallowtail, and soybean bugs. He has also contributed to development in the biological control of thrips in greenhouses and open

fields. Prof. Hirose spent several periods abroad (e.g. as visiting scientist at Texas A & M (1981-1982), and as visiting professor at the University of California, Davis (2000-2001). He published more than 100 papers and gave many lectures both in Japan and abroad. In 1988, the annual award of the Japanese Society of Applied Entomology and Zoology went to him for his outstanding work on evaluation of parasitic wasps as biological control agents against insect pests.

He served as a vice president of the IOBC and both president and vice president of IOBC/SEARS, devoting his service to the development of biological control, especially in South and East Asia. He has been a member of the IOBC working group “egg parasitoids” since the group was established in 1982.

Following his retirement, he still continues to do research on the biological control of insect pests and the ecology and behavior of egg parasitoids, staying at Department of Entomology, University of California, Davis, USA, and Biocontrol Laboratory, National Agricultural Research Center, Tsukuba, Japan. He is still enjoying research, probably because for him, to do research is to find this world worth living in.

(Composed from various sources by Joop van Lenteren)

Selected publications by Y. Hirose:

- Hirose, Y., Kimoto, H. & Hiehata, K. 1976. The effect of host aggregation on parasitism by *Trichogramma papilionis* Nagarkatti (Hymenoptera: Trichogrammatidae), an egg parasitoid of *Papilio xuthus* Linne (Lepidoptera: Papilionidae). *Appl. Entomol. Zool.* 11: 116-125.
- Hirose, Y., Vinson, S.B. & Hirose, Y.-K. 1988. Protandry in the parasitoid *Cardiochiles nigriceps*, as related to its mating system. *Ecol. Res.* 3: 217-226.
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- Hirose, Y. 2006. Biological control of aphids and coccids: a comparative analysis. *Popul. Ecol.* 48: 307-315.

Prof.dr. Carl B. Huffaker (1914 –1995, USA)



Carl Barton Huffaker attended the University of Tennessee, Knoxville, where he earned a BA (entomology) in 1938 and an MS (plant ecology) in 1939. He continued his graduate studies at Ohio State University, Columbus, earning his PhD (entomology/ ecology) in 1942. While still in college he spent the summers of 1937, 1938 and 1939 working on malaria control for the Malaria Studies Division of the Tennessee Valley Authority. During the 1940-41 academic year, he was a graduate assistant (teaching) in zoology for Professor Dwight M. DeLong at Ohio State University. From April 1941 to December 1943 he was an assistant entomologist at the University of Delaware Agricultural Experiment Station. From December 1943 to January 1946 he was an entomologist for the Health and Sanitation Division of the U.S. Institute of Inter-American Affairs stationed in Bogotá, Colombia and then Santo Domingo (then Ciudad Trujillo), Dominican Republic. During this period he conducted field research on malaria in Colombia, Haiti and the Dominican Republic.

In 1946 he joined the University of California as an assistant entomologist in the Department of Biological Control, Riverside. His first assignment was to lead, with James K. Holloway of the U. S. Department of Agriculture, the effort toward biological control of the Klamath weed. This European weed, also known as St. John's wort, *Hypericum perforatum*, had become in the 1940s a scourge on California range lands and threatened the grazing industry of northern California and other western states on some 2.25 million acres. A program of importation of several European species of insects that fed exclusively on the weed was started after reaching an agreement between the University of California and the U. S. Department of Agriculture's Bureau of Entomology and Plant Quarantine. The candidate species had been tried in Australia, where the weed had been introduced in the 1880s. The insects had become established and provided some degree of control. Although it would have been easy, under normal conditions, to obtain the insects from Europe, the war made collection there impossible. After the necessary arrangements among the involved organizations, collaborators from the Australian Council for Scientific and Industrial Research collected the insects and prepared them for shipment, and the U.S. Army Transport Command took the responsibility of bringing the material to California.

In California, at the Department of Biological Control in Albany, Carl Huffaker, Jim Holloway, and their collaborators took care of the imported material, reproduced the various species, and colonized them in the field. The colonized species were the leaf-eating beetles *Chrysolina quadrigemina* and *C. hyperici* and the root-borer beetle *Agilus hyperici*. Eventually, a fourth species was colonized, the gallfly *Zeuxidiplosis giardi*. This program resulted in total and permanent control of Klamath weed in its area of distribution in the western states, where it is found at very low densities as a roadside plant in shady situations. The economic savings afforded by this project were estimated to be some \$79 million as of 1984. The benefits continue to accrue. Although the immediate economic benefits of this project are very significant, it has also contributed to the understanding of various aspects of the principles of biological control and population dynamics. Close, long-term quantitative studies by Huffaker and his collaborators on the consequences of this biological control project have led to improved understanding of the principles of biological control of plants and the ecological impact that phytophagous insects can have on succession and community (vegetational) structure. In addition, this example provided insights into the nature of the whole complex of natural control of populations, involving both density-independent (e.g.,

weather and physical terrain) and density-related (dependent) factors such as regulating natural enemies or more direct competition.

In the context of basic science, this pioneering example was most important in showing the interactions of physical conditions and herbivores in determining the abundance and distribution of specific plant species and, consequently, the composition of vegetation. Another long-term project led by Carl involved the biological control of puncture vine, a spiny-burred, toxic weed in wasteland, urban, and certain crop situations. Two weevils that interfere with the production of seeds significantly reduced the density of the weed in most of the affected areas. A significant ecological finding was that the destruction or prevention of seeding of about 45% was sufficient, apparently, to bring about the decline in the weed's population.

A student of population dynamics, especially of the interactions of factors determining density regulation, Carl Huffaker led field and laboratory work conducting "a series of experiments designed to shed light upon the fundamental nature of predator-prey interaction, in particular, and the interrelations of this coaction with other important parameters of population changes, in general." The field work involved the cyclamen mite, *Phytonemus pallidus*, a pest of strawberries, and two predatory mites in the genus *Amblyseius*, while the laboratory studies were conducted on the six-spotted mite, *Eotetranychus sexmaculatus*, and the predator *Metaseiulus occidentalis* on orange fruits. The cyclamen mite studies showed the principal role that predatory mites have in determining the pest population density. They also showed that by purposely introducing the pest early in the cycle, the interaction between prey and predators was sustained at a low density. This work pioneered the now common practice in certain areas of deliberate introduction of a pest species itself as a means of establishing quickly and perpetuating a solid biological control program. It also provided one of the clearest examples of the physical environment (density independent) and the density-dependent regulating agencies operating together to produce any given level of natural control. The laboratory work using orange ecosystems highlighted the contribution that heterogeneity of the environment can play in the balance of nature while not, however, entirely substituting for a basic density-dependent regulating mechanism.

At a time when population ecologists and pest control specialists were arguing, sometimes passionately, about whether populations were regulated by biotic or physical factors (the density dependent/independent controversy), Carl B. Huffaker was carefully planning and meticulously conducting this research to gain understanding of the population regulating mechanisms in various living systems and was rigorously analyzing his data and that of others. His conclusions, for which he was recognized as one of the leading population ecologists of his time, were the result of his strict adherence to research procedures of the highest calibre. His example as an imaginative, persistent, and demanding researcher is part of the legacy he left to all who were acquainted with him and his work.

Yet another project carried on under Carl Huffaker's leadership was the biological control of the olive scale. This insect was the major pest of California olives; it was also an important pest of many deciduous fruit crops and ornamental shrubs and trees. The successful control of this pest was achieved by importation and colonization of two species of wasps that develop at the expense of the scale, killing it. In 1949 a search for natural enemies of the scale was started. One species was collected in various Mediterranean and Middle Eastern areas. The most promising material was collected in Iran and Iraq in 1952. This parasitoid species became widely distributed in California. In 1957 a second species was found in Pakistan and was widely colonized throughout the state. During a period of some thirty years Carl and a group of collaborators implemented the program and carefully documented the biological and ecological interactions of the natural enemies with the pest and their economic impact on the olive industry. The result showed the effectiveness of natural enemies in regulating the

density of their hosts, and strongly suggested that a complex of natural enemies may complement each other and regulate the host population more effectively than one (the “best”) acting alone. As for the economic impact, Carl estimated that the savings as of 1984 to the California olive industry were \$15 million.

Biological control, as a tactic of pest control, in many cases involves the deliberate colonization of natural enemies into new areas. The precedence of these natural enemies may vary, and in any given area where biological control is implemented it may happen that several species, each one being a native of a different area, are colonized simultaneously or over a long period in the same area. Under these circumstances competition among some of the natural enemies may occur to the point that a species may be prevented from being established, or an already established species may be displaced by a newcomer. In other cases the species may complement each other, regulating the prey population at a lower level. The research on biological control of Klamath weed and of olive scale by Carl shed significant light on this most important aspect of ecological interactions between living organisms.

In addition to his regular activities at the University of California, Professor Huffaker generously shared his scientific and administrative expertise by participating in a number of national and international organizations. As a member of the Subcommittee on the Use and Management of Biological Resources of the U.S. National Committee of the International Biological Program, and as world coordinator of the IBP on biological control of spider mites, Professor Huffaker prepared, at the request of the National Science Foundation, a feasibility study for a long-term, nationwide, integrated pest control research program. The document he and his associates prepared was the basis for the project that eventually became widely known as “the Huffaker project.” This project, funded by the NSF and the Environmental Protection Agency, involved studies on six crop ecosystems, with nineteen land-grant universities and segments of the U.S. Department of Agriculture and U.S. Forest Service cooperating in the research. With an ecological approach to insect and mite pest control, the project has provided the expertise and methods for great reduction in the use of the more environmentally objectionable pesticides. As an example of the development of a stable program of pest control, the project serves as the prototype for integrated pest management programs worldwide.

Huffaker taught an undergraduate course in insect ecology for several years with Ray F. Smith and P.S. Messenger and a graduate course in insect population ecology. He also led numerous graduate seminars on biological control and insect ecology. Under his guidance the International Center for Biological Control at the University of California, which he founded and directed, sponsored training programs, urban entomology research and education, and developed or sponsored books on integrated pest management and biological control. The Center served also as a vehicle for other extramural-sponsored research, particularly crop ecosystem studies.

Huffaker was a long-time member of the International Organization for Biological Control, serving as its president from 1972 to 1976 and again from 1978 to 1980. He was president of the Entomological Society of America, member of the Executive Council of the Intersociety Consortium for Plant Protection, member of the Pesticide Advisory Board of the California Department of Food and Agriculture, and a member of the California Statewide Integrated Pest Management Project Organizing Committee. He served on a joint U.S./U.S.S.R. Integrated Pest Management Committee, which organized a reciprocal research and exchange effort. He participated in global conferences and task forces of the Food and Agriculture Organization and the United Nations Environmental Program. His numerous services to educational and government agencies included consultations with and briefs to the Environmental Protection Agency, National Science Foundation, President’s Council for Environmental Quality, Agricultural Research Policy Advisory Committee, and to a number

of state and national investigative agencies. At the University of California he served on the National Academy of Sciences; The C. W. Woodworth Award for Outstanding Achievement in Entomology; Honorary Fellow of the Royal Entomological Society of London; Scholar-in-residence, Rockefeller Foundation, Bellagio, Italy; Guggenheim Fellow; Fellow of the American Association for the Advancement of Science; Fellow of the Franklin Institute; The Louis E. Levy Medal of the Franklin Institute, as well as its Journal Premium Award; and co-recipient of the Wolf Prize from the Wolf Foundation, Israel.

The results of Professor Huffaker's very productive scientific career are recorded in the more than 200 papers in numerous scientific journals and chapters in books. He was editor of several books on biological control and integrated pest management.

(L.E. Caltagirone & D. Dahlsten, 1995; shortened by Joop van Lenteren, 2006)

Key publications Carl Huffaker

- Huffaker, C.B. 1941. Egg parasites of the harlequin bug in North Carolina. *J. Econ. Entomol.* 34, 117.
- Huffaker, C.B. and C.E. Kennett. 1956. Experimental studies on predation. I. Predation and cyclamen mite populations on strawberries in California. *Hilgardia* 26, 191-222.
- Huffaker, C.B. 1957. Fundamentals of biological control of weeds. *Hilgardia* 27, 101-57.
- Huffaker, C.B. 1959. Biological control of weeds with insects. *Ann. Rev. Entomol.* 4, 251-76.
- Huffaker, C.B. 1964. Experimental studies on predation: Dispersion factors and predator-prey oscillations. *In: Readings in Population and Community Ecology*, (ed.) W. E. Hazen, pp. 164-204. Philadelphia: W. B. Saunders.
- Huffaker, C.B. 1971. The phenomenon of predation and its roles in nature. *In: Dynamics of Populations*, (eds) P. J. den Boer and G. R. Gradwell, pp. 327-43. Wageningen: Centre of Agricultural Publishing and Documentation.
- Huffaker, C.B. 1971. (ed.), *Biological Control*. Plenum, New York, 511 pp.
- Huffaker, C.B. and J.E. Laing. 1972. Competitive displacement without a shortage of requisites? *Res. Pop. Ecol.* 14, 1-17.
- Huffaker, C.B. 1974. Some implications of plant-arthropod and higher-level arthropod food links. *Environ. Entomol.* 3, 1-9.
- Huffaker, C.B., F.J. Simmonds and J.E. Laing. 1976. The theoretical and empirical basis of biological control. *In: Theory and Practice of Biological Control*, (eds.) C.B. Huffaker and P.S. Messenger, pp. 41-78. New York: Academic Press.
- Huffaker, C.B. and P.S. Messenger (eds). 1976. *Theory and Practice of Biological Control*. Academic Press, New York, 788 pp.
- Huffaker, C.B., 1977. Augmentation of natural enemies in the People's Republic of China. pp. 329-339. *In: R.L. Ridgway and S.B. Vinson (eds). Biological Control by Augmentation of Natural Enemies*. Plenum Press, New York.
- Huffaker, C.B., 1980. *New Technology of Pest Control*. Wiley, New York: 500 pp.
- Huffaker, C.B. (ed.) & R.L. Rabb. 1984. *Ecological Entomology*. New York: Wiley-Interscience.

Prof.dr L.Y. Li-Ying (China, 1931)



Prof.dr Li Li-Ying studied from 1951-1956 at the Division of Plant Protection of the Department of Agronomy of the Moscow Agricultural Academy (Timiryazev, Moscow, USSR), where she graduated in 1956. From 1956-1961, she worked at the Entomological Institute of the Academy Sinica, and since 1961 she has worked at the Guangdong Entomological Institute in Guangzhou as Chief Senior Scientist and later Director of the Guangdong Entomological Institute. She has been Vice President and President of the Chinese Entomological Society, member, Vice-President and Honourable member of the council for International Entomological Congresses, member of the council for the International Plant Protection Congresses, member of the council for the Asia-Pacific Conferences of Entomology, President and Honourable President of the Academic Council of the Guangdong Entomological Institute, and Professor at the South China Agricultural University.

Prof. Li Li-Ying studied biology, ecology, mass production, oviposition behaviour, diapause and in vitro rearing of *Trichogramma* spp. She also worked on introduction, mass production and utilization of entomopathogenic nematodes, in vitro rearing of *Anastatus japonicus* and its utilization, mass production and utilization of *Eucanthecona furcellata* and *Cryptolaemus montrouzieri*, biological control of *Mikania micrantha*, and rice IPM. She has published approximately 110 papers and 9 books.

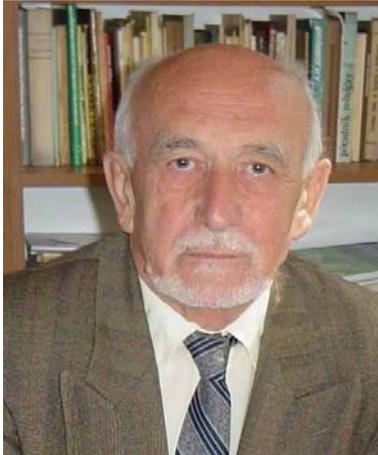
(Composed from various sources by Joop van Lenteren)

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- Li-Ying. Li. 1990. Mass production of *Trichogramma* spp. and *Anastatus japonicus* Ashmead with artificial diets in China. In: "The Use of Natural Enemies to Control Agricultural Pests". Proceedings of the International Symposium on Utilization of Parasitoids and Predators, Japan, 1989. pp. 207-211.
- Li-Ying. Li. 1990. Parasitoids. In: "Pest Control Strategy and Methods". Academic Press: 427-447 (in Chinese).
- Li-Ying. Li. 1992. Recent status of biological control of insect pests in China. 1992. In: "Biological Control in South and East Asia" (ed. Y. Hirose, Kyushu University Press). PP. 1-10.
- Li-Ying. Li. 1992. In vitro rearing of parasitoids of insect pests in China. *Korean Journal of Applied Entomology* 31: 241-246.
- Li-Ying. Li. & Di-fang, Zhu. 1992. Temperature and host factors, inducing the diapause of *Trichogramma* spp. *Natural Enemies of Insects* 14: 113-126 (in Chinese).
- Li-Ying. Li. 1994. Worldwide use of *Trichogramma* for biological control on different crops - A survey. In: "Biological Control with Egg Parasitoids" (eds E. Wajnberg & S.A. Hassan). Oxon, UK. CAB International, Chapter 2, pp. 37-54.
- Li-Ying. Li, Di-fang, Zhu. 1995. Intraspecific variation and the role of superparasitism in diapause induction of *Trichogramma evanescens* Westwood. *Entomologia Sinica* 2: 337-344.
- Li-Ying. Li, Ren, Wang &, Waterhouse, D.F. 1997. The Distribution and Importance of Arthropod Pests and Weeds of Agriculture and Forestry Plantations in Southern China. ACIAR Monograph No. 46, 185 pp.

- Li-Ying. Li. 1997. "Parasitoids and Predators (Insecta) of Agriculture and Forestry Arthropod Pests". Guangdong High Education Press, 416 pp.
- Li-Ying. Li. 1998. New advances in research on *Trichogramma*. In "New Advances in Biological Control of Insect Pests and Diseases of Agricultural Crops in China" (ed. Piao Yongfan, Chinese Agricultural Press).

Prof.dr J.J. Lipa (1932, Poland)



Prof.dr Jerzy Lipa obtained a BSc in Biology (1953) and an MSc in Parasitology (1957) at the Warsaw University, a PhD in Entomology (1962) and a DSc in Zoology (1967) at the Poznan Agricultural University. During his studies, he worked as Research Assistant at the Laboratory of Agricultural Entomology of the Institute of Plant Protection in Pulawy from 1953-1957, he was Head of the Laboratory of Biological Control at the Institute of Plant Protection in Poznan from 1960-1966, Associate Professor and Head of the Department of Pest and Disease Control and Head of Laboratory of Biological Control at the Institute of Plant Protection in Poznan from 1967-1971, Professor and Head of the Department of Pest and Disease Control and Head of Laboratory of Insect Pathology of the Institute of Plant Protection, Poznan from 1972-1989, and Professor and Head of the Department of Biological Control and Quarantine of the Institute of Plant Protection in Poznan from 1972-1989. Since 2003, he has been Active Professor Emeritus at the Department of Biological Control and Quarantine of the Institute of Plant Protection in Poznan.

Prof. Lipa has spent several periods at foreign research institutes: from 1958–1959, he worked as Research Associate in the Laboratory of Insect Pathology, Department of Biological Control, University of California, Berkeley (USA) with a Fellowship of the Rockefeller Foundation, from 1965-1966 he received a fellowship of the USSR Academy of Sciences which was used to work as visiting scientist at the Institute of Zoology, USSR Academy of Sciences in Leningrad; All-Union Institute of Plant Protection in Leningrad; Ukrainian Institute of Plant Protection in Kiev; Institute of Animal Morphology AN USSR in Moscow; State University in Irkutsk; Limnological Institute of AN USSR in Listvennichnaya at Baykal Lake; Biological Institute SO AN USSR in Novosibirsk; Agricultural and Forestry University in Voronezh. Further, he worked as invited research professor at SARH and International Center for Improvement of Maize and Wheat (CIMMYT), Mexico (1989), at the Institute of Plant Protection, Agricultural Research Center of Finland in Jokioinen, and the University of Helsinki (1990), at the University of Cordoba, ETSIAM, Chair of Applied Entomology, Cordoba (Spain), and at the Public University of Navarra (UNAM) in the Departamento Produccion Agraria, Pamplona (Spain).

Prof. Lipa is member of various foreign and domestic Academies of Sciences, and honorary member of domestic and foreign Scientific Societies. He has been active in a number of national and international organizations, committees, societies and boards, e.g. Member of FAO and WHO Panel of Experts on Integrated Pest Control, National Coordinator - Biological and Integrated Plant Protection Programme, Vice President of the International Organization of Biological Control (IOBC-EPRS), etc. etc. He received a number of national and international orders, medals, prizes and awards, e.g. Silver Cross of Merit (from the President of Poland), Special prize from the Minister of Science, Education and Technology for outstanding scientific achievements and implementation of biological control into greenhouse crop protection systems in Poland (with S. Pruszyński and co-workers), Special prize of the Minister of Agriculture and Forestry for implementation of use of microbial insecticides in plant and forest protection in Poland (with co-workers), Gold Medal of Merit from the Minister of Agriculture for initiation of production of biopesticides in Poland, Cavalier's Cross of the Order Polonia Restituta (from the President of Poland), Gold Medal of "Merit for Services to Environmental Protection" from the Minister of Environmental

Protection, Gold Medal of Appreciation from the Faculty of Agriculture of the Agricultural University in Krakow, Poland, etc.

Prof. Lipa has published more than 1000 articles, reports and book chapters.
(Composed from various sources by Joop van Lenteren)

Selected publications by J.J. Lipa:

Lipa, J.J. 1958. Effect on earthworm and *Diptera* populations of BHC dust applied to soil. *Nature* 181: 863.

Lipa, J.J. & Steinhaus, E.A. 1959. *Nosema hippodamiae* n. sp., a microsporidian parasite of *Hippodamia convergens* Guerin (Coleoptera, Coccinellidae). *J. Insect Pathol.* 1: 304-308.

Lipa, J.J. 1968. *Nosema leptinotarsae* sp. n., a microsporidian parasite of the Colorado potato beetle (*Leptinotarsa decemlineata*) *J. Invert. Pathol.* 10: 111-115.

Lipa, J.J. 1971. Microbial control of mites and ticks. pp. 357-373. In: "Microbial Control of Insects and Mites" (eds. H.D. Burges & N.W. Hussey). Academic Press, London, 861 pp.

Lipa, J.J. & Bartkowski, J. 1972. A newly discovered poxlike virus disease of dung beetles, *Geotrupes silvaticus* (Coleoptera: Scarabaeidae). *J. Invert. Pathol.* 20: 218-219.

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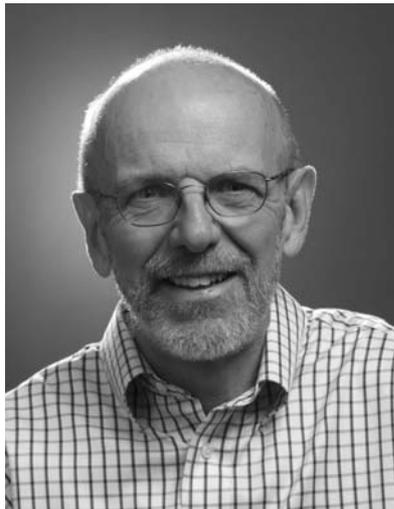
Lipa, J.J. & Hokkanen, H.M.T. 1992. *Nosema meligethi* I. & R. (Microsporidia) in populations of *Meligethes* spp. in Europe. *Biocontrol Sci. Technol.* 2: 119-125.

Lipa, J.J. & Hokkanen, H.M.T. 1992. Safety of *Nosema meligethi* I. and R. (Microsporida) to *Apis mellifera* L. and *Coccinella septempunctata* L. *J. Invert. Pathol.* 60: 310-311.

Lipa, J.J., Santiago-Alvarez, C., Vargas-Osuna, E., Aldebis, H.K., Caballero, P. & Hernandez-Crespo, P. 1993. Microorganisms, nematodes and parasitoids of *Ocnogyna baetica* (Rambur) (Lep.: Arctiidae) in southern Spain with potential for use in biological control. *Biocontrol Sci. Technol.* 3: 347-353.

Lipa, J.J. & Smits, P.H. 1999. Microbial control of pests in greenhouses. pp. 295-309. In: "Integrated Pest and Disease Management in Greenhouse Crops" (eds R. Albajes, M.L. Gullino, J. C. van Lenteren & Y. Elad). Kluwer Academic Publishers, Dordrecht. 545 pp.

Prof.dr. R.F. Luck (1945, Canada)



Bob Luck started his work in entomology through his interest in forestry. After doing a tour of duty in the navy from 1966-68 he started working on his PhD at UC Berkeley. During that time the Berkeley faculty consisted of such biocontrol greats as Huffaker, van den Bosch, Hagen and Dahlsten. Dahlsten was Bob's major professor. During his PhD research he studied the control of the pine needle scale. These scales had become an upset-pest following area-wide sprays with malathion against mosquitoes.

After he finished his PhD in 1973 he applied for a series of positions in Forestry, but was told in no uncertain terms by van den Bosch that he should take the position in the Department of Biological Control in Riverside. Upon his arrival there, Bob initiated work on the biological control of the elm leaf beetle, and eventually became involved with the biological control of the citrus red scale (CRS). This territory had been occupied for a long time by Paul DeBach. Bob became very interested in the reasons why the successful parasitoid *Aphytis lingnanensis* was replaced by the parasitoid *Aphytis melinus*. The reasons for this displacement were found through detailed studies of the oviposition and sex allocation of the parasitoids. *Aphytis melinus* appeared to be able to produce daughters on smaller scales than *A. lingnanensis*, eventually leading to the displacement of *A. lingnanensis*. To study the dynamics of the interaction between the CRS and *Aphytis melinus*, a large-scale, multi-year study was initiated, in which the density of both CRS and the parasitoids was monitored.

Bob was also much involved in the development of an economically and biologically highly successful IPM program for control of citrus pests.
(Rob Wiedenmann & Joop van Lenteren, 2005)

Publications

> 150 scientific papers in books and journals.

Luck, R.F. and Podoler, H. 1985 Competitive exclusion of *Aphytis lingnanensis* by *A. melinus*: Potential role of host size. *Ecology* 66, 904-913.

Luck, R.F., B.M. Shepard and P. Kenmore. 1988. Experimental methods for evaluating arthropod natural enemies. *Annual Review of Entomology* 33, 367-391.

Luck, R.F., Forster, L.D., and Morse, J.G., 1997. An ecologically based IPM program for citrus in California's San Joaquin Valley using augmentative biological control. *Proceedings of the International Society of Citriculture, VIII International Citrus Congress*, May 12-17, 1996, Sun City, South Africa 1, 504-507.

Luck, R.F., Janssen, J.A.M., Pinto, J.D. and Oatman, E.R. 2000. Precise sex allocation and sex ratio shifts by the parasitoid *Trichogramma pretiosum*. *Behavioural Ecology and Sociobiology* 49, 311-321.

Luck, R.F. and L.D. Forster. 2003. Quality of augmentative biological control: A historical perspective and lessons learned from evaluating *Trichogramma*. Pp. 231-246. In J. C. van Lenteren (ed). *Quality Control and Production of Biological Control Agents*. CABI Publishing Wallingford, Oxon. UK.

Dr P. Neuenschwander (1943, Switzerland)



Dr. Peter Neuenschwander followed high school in Switzerland and obtained a Gymnasiallehrer-Diplom (higher teaching degree) in 1969. This was followed by a PhD in Zoology (minors: Botany, Chemistry) from the University of Bern, Switzerland in 1972. He conducted his postdoctoral studies at Prof. K.S. Hagen's laboratory at the University of California, Berkeley, USA from 1973-1975, where he worked on biological control of pests of alfalfa and artichoke. He then joined FAO in a project on IPM in olives in Chania, Crete, Greece from 1976-1981. Still with FAO, he led a biological control project against leaf mining flies in Dakar, Senegal (1982). In 1983, he joined the biological control project against cassava mealybug at IITA in Ibadan, Nigeria. The project expanded to include biological control and IPM of

mango mealybug, spiraling whitefly and floating water weeds, and he moved to Cotonou, Benin, in 1988. Since then, he has successively been coordinator of the Biological Control Programme, director of the Plant Health Management Division, as well as Office-in-Charge of the Biological Control Center for Africa, IITA, Benin. He was member of the Research and Development Council of IITA. For his contribution he was honoured by the African Association of Insect Scientists and the International Society for Tropical Root Crops - Africa Branch.

Peter Neuenschwander performed many missions, exploration trips and consultancies for various organizations. He is author of well over 100 peer-reviewed research articles, a book and book chapters. He reads and speaks German, French, English, Italian, Greek and learns Fon. He retired from IITA at the end of 2003, and is living in a Benin village and with his family near Bern.

Selected publications by P. Neuenschwander:

- Neuenschwander, P., Hagen, K.S. & Smith, R.F. 1975. Predation on aphids in California's alfalfa fields. *Hilgardia* 43, 53-78.
- Neuenschwander, P. & Michelakis, S. 1978. The infestation of *Dacus oleae* (Gmel.) (Diptera, Tephritidae) at harvest time and its influence on yield and quality of olive oil in Crete. *Z. ang. Ent.* 86, 420-433.
- Neuenschwander, P., Schulthess, F. & Madojemu, E. 1986. Experimental evaluation of the efficiency of *Epidinocarsis lopezi*, a parasitoid introduced into Africa against the cassava mealybug *Phenacoccus manihoti*. *Ent. exp. appl.* 42, 133-138.
- Neuenschwander, P., Hennessey, R.D. & Herren, H.R. 1987. Food web of insects associated with the cassava mealybug, *Phenacoccus manihoti* Matile-Ferrero (Hemiptera: Pseudococcidae), and its introduced parasitoid, *Epidinocarsis lopezi* (De Santis) (Hymenoptera: Encyrtidae), in Africa. *Bull. ent. Res.* 77, 177-189.
- Neuenschwander, P. & Herren, H.R. 1988. Biological control of the cassava mealybug, *Phenacoccus manihoti*, by the exotic parasitoid *Epidinocarsis lopezi* in Africa. *Phil. Trans. R. Soc. Lond.* 318, 319-333.
- Herren, H.R. & Neuenschwander, P. 1991. Biological control of cassava pests in Africa. *Ann Rev. Entomol.* 36, 257-283.
- Neuenschwander, P. 1996. Evaluating the efficacy of biological control of three exotic homopteran pests in tropical Africa. *Entomophaga* 41, 405-424.

- Neuenschwander, P. 1998. Review of "Soft Scale Insects: Their biology, natural enemies and control" (eds Y. Ben-Dov & C.J. Hodgson). *Ent. exp. et Appl.* 86: 197-200.
- Neuenschwander, P. 2003. Biological control of cassava and mango mealybugs in Africa. *In*: "Biological Control in Integrated Pest Management Systems in Africa" (eds P. Neuenschwander, C. Borgemeister & J. Langewald). CABI Publishing, Wallingford, pp. 45-59.
- Neuenschwander, P. 2004. Harnessing nature in Africa. Biological control can benefit the pocket, health and the environment. *Nature* 432: 801-802.

Prof.dr S.K. Pruszyński (1940, Poland)



Prof.dr Stefan Kazimierz Pruszyński studied at the Agricultural University of Poznan (Poland) where he obtained an MSc degree in 1965. In 1975 he finished his PhD research at the Plant Protection Institute in Poznan, and he obtained the degree of DSc in 1983 at the same institute. In 1989 he was appointed Professor of Agricultural Sciences in Poznan. During his appointment at the Plant Protection Institute he moved up from Assistant (1965) to Professor and General Director of the Institute (1989-2007). Currently, he is head of the Department of Ecology and Agricultural Environment Protection. He was working as Research Assistant at the Washington State University (USA) from 1970-1971.

He coordinated several large national research programs (e.g. the large Polish research program on Elaboration of Backgrounds of Integrated Plant Protection). He was cofounder and first president of the Polish Plant Protection Society. He coordinated plant protection research for Central and East European countries.

Stefan Pruszyński has been an active member of many professional bodies related to plant protection (e.g. IOBC/EPRS, IOBC Global, European Plant Protection Organization, and several national organizations such as the Polish Entomological Society and the Polish Plant Protection Society).

Stefan Pruszyński edited several books on plant protection, was co-editor of the Polish Journal of Plant Protection Research and a member of various editorial boards of national and international journals. He organized a number of scientific conferences in the field of plant protection. He published more than 115 scientific papers, 220 technical and popular articles and a number of book chapters. He received several awards, including a Special Award from the Ministry of Science Education and Technology for Outstanding Scientific Achievements in biological control research for control of greenhouse pests (1976).

(Composed from various sources by Joop van Lenteren)

Selected publications by S.K. Pruszyński:

- Lipa J.J., Pruszyński, S. & Węgorzek, W. 1967. Preliminary report on the introduction of *Phytoseiulus persimilis* to Poland (in Polish, English summary) *Biul. Inst. Ochr. Roślin Poznań*: 36: 87-92.
- Pruszyński, S. & Lipa, J.J. 1971. The occurrence of predatory Coccinellidae on alfalfa crops. *Ekologia Polska* XIX 26: 365-386.
- Pruszyński, S. & Cone, W.W. 1972. Relationships between *Phytoseiulus persimilis* and other enemies of the two spotted spider mite on hops. *Environmental Entomology* 1: 431-433.
- Pruszyński, S., Miciński, B. & Beger, W. 1978. Integrated control of hop aphid (*Phorodon humuli* Schr.) (in Polish, English summary). *Mat. XVIII Sesji Nauk. Inst. Ochr. Roślin, Poznań*: 199-212.
- Pruszyński, S. & Węgorzek, W. 1980. Researches on biology and introduction of *Podisus maculiventris* Say - new for Poland predator of the Colorado potato beetle (*Leptinotarsa decemlineata* Say). *Mat. XX Sesji Nauk. IOR, Poznań*: 127-136.
- Pruszyński, S. 1982. Biological and integrated methods of protection of the glasshouse cultures against pests - advantages and prospects (in Polish, English summary). *Mat. XXII I XXIII Sesji Nauk. Inst. Ochr. Roślin*: 293-301.

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- Pruszyński, S. 1992. Research on and use of biological methods of pest control in glasshouse crops in Poland. *Bulletin OEPP/EPPO* 22: 405-410.
- Pruszyński, S. 2005. Plant Protection in Poland: Past, Present and Future. *Ann. Rev. Agricul. Engineering* 4: 11-20.
- Pruszyński, S. 2006. Crop protection in sustainable agriculture (in Polish, English summary). *Probl. Inż. Roln.* 2: 71-80.

Prof. dr. Filippo Silvestri (1873-1949, Italy)



Filippo Silvestri was among the entomologists who met in Stockholm in 1948, on the occasion of the 8th International Congress of Entomology, and proposed to found the International Organization for Biological Control. He was one of the pioneering scientists who greatly contributed to the development and spread of biological control of pest insects. After the first successful biocontrol programs of *Pseudaulacaspis pentagona*, developed with Antonio Berlese when he started his activity in Portici, he enthusiastically continued his deep involvement in a number of different projects, which took him around the world for several years, to collect and study beneficial insects. He became a world authority in the field, and was invited by different foreign countries (USA, Argentina, Spain, Mexico, Brazil) to supervise several biological control programs. This successful

research work in agriculture was complemented by an impressive series of studies on the biology and systematics of insects. His outstanding achievements were internationally recognized with several honours and prizes, and two honorary degrees of “*doctor honoris causa*”. The lecture “Insect Polyembryony and its general biological aspects”, given at Harvard University (USA) in 1936, when he was nominated “*doctor honoris causa*”, represents a brilliant contribution to the basic biology of parasitic Hymenoptera.

Selected publications by Filippo Silvestri

- Silvestri, F. 1905. Un nuovo interessantissimo caso di germinogronia (poliembrionia specifica) in un Imenottero parassita endofago con particolare destino dei globuli polari e dimorfismo larvale. *Rendiconti R. Accademia dei Lincei, Classe Scienze Fisiche Matematiche Naturali* 14 Serie 5 (10), 534 - 542.
- Silvestri, F. 1910. A survey of the actual state of agricultural entomology in the United States of North America. *The Hawaiian Forester and Agriculturist* 6, 287-336.
- Silvestri, F. 1909b. Squardo allo stato attuale dell'entomologia agraria negli Stati Uniti del Nord America e ammaestramenti che possono derivarne per l'agricoltura italiana. *Bollettino Società Agricoltori Italiani*, Roma 8, 1-65.
- Silvestri, F. 1937. Insect polyembryony and its general biological aspects. *Bulletin Museum Comparative Zoology*, Harvard College 81 (4), 469 - 498.

Dr. Frank Wilson (? - ?; UK and Australia)



It has been difficult to obtain information about Frank Wilson, though I (van Lenteren) contacted several Australian and UK researchers. Wilson's special interest was in the biological control of weeds. He was posted to the south of France and remained there until June, 1940. He escaped from France on the last ship to leave Bordeaux. He reached Australia at the end of 1940. In 1959, Frank Wilson, of the CSIRO Division of Entomology, was appointed Scientific Liaison Officer in the Australian Scientific Liaison Office, London, for a period of three years. He was elected a Fellow of the Institute of Biology in 1964. Mr Wilson was Officer-in-Charge of the Sirex Biological Control Unit, England. The task of his group at Silwood Park was control of Sirex, the *Pinus radiata* wood wasp. Initially the group concentrated on arthropod natural enemies, but eventually the group demonstrated that the nematode *Deladenus* would be effective against Sirex. Wilson was OIC of the "Sirex Unit" at the Imperial College field station from about 1962 until about 1974.

Frank Wilson was Vice-president of IOBC in 1971. He was a very well known biological control expert. One of his important achievements has been the production of an extremely well made film "The biological control of insects" in 1960, with excellent examples of various types of biological control and beautiful macrobiological images of egg laying of natural enemies.

(Composed from various sources by Joop van Lenteren)

Selected publications by Frank Wilson

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Prof.dr. Keizo Yasumatsu (1908-1983, Japan)



Keizo Yasumatsu was born in Tokyo on 1 March 1908, educated in Fukuoka and graduated from Kyushu University in 1933. He received his doctorate from Kyushu University in 1945 and his doctoral dissertation was entitled “Some analyses on the growth of insects, with special reference to a phasmid, *Phraortes kumamotoensis* Shiraki”. In 1933 he was appointed Non-regular Staff Member at Kyushu University where he worked as assistant curator. In 1939 he was appointed Assistant Entomologist, followed by the appointment to Associate Professor of Entomology (1942) and Professor of Entomology (1958). He retired in 1971 after 38 years of service. Prof. Yasumatsu had already published 36 papers on biological, taxonomic and morphological aspects of various insects when he completed his MA Degree, mainly about wasps and bees. Prof. Yasumatsu was a member of several scientific expeditions to Micronesia and China and collected many insect species. In 1945, he had become internationally renowned for the systematics of wasps, bees, ants, fleas, and stick insects. In 1946, he discovered an encyrtid wasp parasitic on red wax scale, one of the most serious pests of citrus, tea, persimmon and other economic plants in Japan. His studies led to the conclusion that this parasitoid was a very effective biological control agent of the red wax scale and after its liberation in many locations, the red wax scale no longer developed to destructive pest densities. For this success, he received the Nihon Nogaku Sho prize from the Association of Japanese Agricultural Science Societies in 1953. Since then, his interests shifted more and more towards the field of biological control.

In 1955 he received a grant to visit entomological and biological control institutes and universities in North America, and after this visit, he began writing articles on natural enemies and biological control. He became an enthusiastic supporter and advocate of the use of natural enemies for the control of pests in Japan. For this work, he was awarded the Asahi Prize from the Asahi Press in 1959. In 1964, Prof. Yasumatsu founded the Institute of Biological Control at Kyushu University. In this period, he carried out field studies on the natural enemies of rice stem borers in southeast Asia. Next he worked on biological control of a group of pests (rice stem borers, aphids, diaspine scales and mites) in The Philippines, Thailand and Hong Kong, in the framework of the International Biological Program (IBP). After his retirement in 1971, he devoted himself to integrated crop protection research in Thailand, a project that was supported by FAO and the Japan International Cooperation Agency (JICA). During 1976-1980, he was also consultant in crop protection for FAO in Korea, Malaysia and Iran.

Aside from his research, he was also active in many educational and scientific organizations, including president of the Entomological Society of Japan (1961-1968) and member of the Science Council. He played an important role in the foundation of the South and East Asian Regional Section (SEARS, now APRS) of IOBC and was the first President of SEARS, and Honorary President until his death in 1983. Prof. Yasumatsu received many awards and honours, among which was the second Harry Scott Smith Memorial Award (University of California) in 1971.

In addition to being an excellent researcher he was an effective teacher, and many of his students are successful entomologists today, holding high positions in universities, government and private industries. He was a prolific writer, publishing more than 600 papers. He wrote a famous book on biological control (Natural enemies – An approach to pest management; 1970) and a text book, Applied Entomology, first edition in 1953. He also wrote

a popular book on insects (Man and Insects) in 1965. Prof. Yasumatsu was a skillful illustrator, and most of the illustrations in his papers and books were drawn by himself.

One of his Japanese colleagues once said that Prof. Yamumatsu was not only a very kind and helpful person and great entomologist, but that he also opened the doors of the Japanese entomological world to foreign entomologists.

The summary of Prof. Yasumatsu's biography is based on a biography written by Yoshihiro Hirashima, 2003, *Esakia* 20, 1-7, 1983. Joop van Lenteren made this summary.

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Prof.dr M.C. Zapater (1957, Argentina)



Prof.dr Miguel Carlos Zapater studied at the University of Buenos Aires and received his diploma of Agronomic Engineering in 1983 from the Faculty of Agronomy. He is currently Associate Professor at the Department of Applied Biology at the Faculty of Agronomy of the University of Buenos Aires and he is also technical director of INSECTARIOS, the first company supplier of beneficial insects in Argentina. He studied abroad to specialize in the genetic control of the Mediterranean fruit fly (1982-1983, ITAL, Wageningen, The Netherlands, with Dr. Alan Robinson), to specialize in electrophoresis and cytology of Mediterranean fruit fly (1984, Pavia, Italy, with Prof.dr Milani) and in field evaluation of genetic methods related to the Mediterranean fruit fly (1991, USDA-ARS, Honolulu, Hawaii, with Dr Donald McInnis). At the University of Buenos Aires, he worked on his PhD from 1986-1989 under the guidance of Dr Alberto Prina, which resulted in the thesis “Estudios sobre líneas translocadas con posibilidad de uso en programas de erradicación de la mosca del Mediterráneo”. He published approximately 50 research papers.

Miguel Zapater is teaching several courses, supervises MSc and PhD students, is active in extension work, gave many national and international lectures, and also publishes in non-scientific journals about his work. Miguel Zapater was founder of IOBC/NTRS and functioned as President of the Regional Section of IOBC from 1989-1994. Currently, he is chairman of the Advisory Board of NTRS. He played a crucial role in establishing NTRS in 1989, as well as during activities to re-establish NTRS in 2005.

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