

# The Biology of Butterflies: the history and future of an international symposium

## ARTICLE

**Niklas Wahlberg,**

**Felix Sperling**

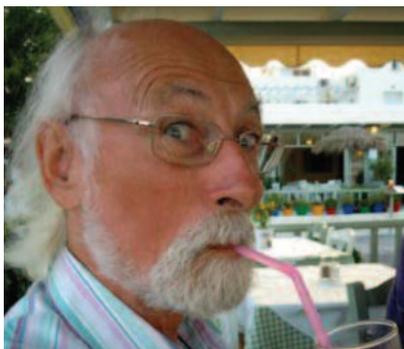
**R.I. Vane-Wright**



**Niklas Wahlberg**

Laboratory of Genetics, Department of Biology, University of Turku, Turku, Finland.

**Niklas Wahlberg** is an evolutionary biologist working on the evolution of Lepidoptera, with a focus on the family Nymphalidae. He has been using molecular methods to elucidate the history of diversification of the family. He is currently a university researcher at the University of Turku, Finland.



**R.I. Vane-Wright**

Department of Life Sciences, the Natural History Museum, Cromwell Road, London SW7 5BD, UK; and Durrell Institute of Conservation and Ecology (DICE), University of Kent, Canterbury CT2 7NR, UK

**Dick Vane-Wright** was responsible for the tropical butterfly collection of the British Museum (Natural History) from 1967–1984. During this period, in collaboration with Phillip Ackery, he organised the first meeting in the *Biology of Butterflies* symposium series. Pictured here as a G&T butterfly.



**Felix Sperling**

Department of Biological Sciences, University of Alberta, Edmonton, AB, Canada T6G 2E9

**Felix Sperling** is a professor at the University of Alberta whose lab encompasses a broad range of projects on the systematics and population genetics of insects. His personal interests focus on Lepidoptera, particularly swallowtail butterflies and speciation. Pictured here with several friends.

### Origins of The Biology of Butterflies symposia

The origin of the international meetings on butterfly biology can be traced back, informally at least, to a speculative visit to the Department of Entomology of the then British Museum (Natural History) by the late Professor Dietrich Schneider. Schneider, one of the great pioneers of insect pheromone biology and co-discoverer of bombykol, was in London during spring 1974 to attend a meeting at the Royal Society, and took the opportunity to visit the 'NHM' in the hope of getting a definitive identification for an *Amauris* butterfly from Kenya. He had become interested in the complex pheromone system of milkweed butterflies, and what Michael Boppré was later to term their *pharmacophagous* relationship with pyrrolizidine-alkaloid-containing plants. At the museum Schneider met Dick Vane-Wright, then a 31-year old butterfly curator specialising on Satyrinae, who offered to give him an identification of his small sample of Danainae, if he was able to call back later in the week—time enough to make dissections.

Schneider duly returned two days later, to be informed that his samples of *Amauris*, which all looked very similar, actually comprised two species. This example of Müllerian mimicry excited Schneider's interest, and a long discussion ensued about species, mimicry, phylogenetics, signalling systems, and Lepidoptera biology in general. Eventually Schneider had to leave but, as a parting shot, he invited Dick to visit his laboratory at Seewiesen—the famous Max-Planck

Institut für Verhaltensphysiologie where Konrad Lorenz had studied, and where ethologist and mimicry specialist Wolfgang Wickler was then in charge of one of the departments, alongside Schneider and his team.

The lure proved too much to resist, and that summer Dick travelled to Bavaria. There he met numerous wonderful physiologists and experimental biologists, including a very young Michael Boppré. Not only did this cement lifelong friendships with both Dietrich and Michael, but it also led Dick to abandon his research on the phylogenetics and biogeography of Satyrinae in favour of a similar programme on the Danainae. In 1975 Dick joined forces with colleague Phillip Ackery to research and write a book-length account of the milkweed butterflies. Initial progress was slow, as Dick was then seconded for two years to the Museum's *New Exhibition Scheme*, but by 1977 he was back full-time with Phillip, and they decided to pick up the pace.

As Dick and Phillip were primarily taxonomists, in endeavouring not only to create a cladistic classification for the

known milkweed butterfly species, but also to review their very extensive biology, they realised that they did not know anywhere near enough about the biology of butterflies in general. And so they hit upon the idea of organising and promoting butterfly biology “workshops”, to be held at the Royal Entomological Society's meeting room (then in nearby Queen's Gate, almost opposite the museum's old entomology building), and inviting a mixture of both “leading lights” and students to talk about their work. The idea was borne out of pure laziness—why not just get others to tell you what butterflies get up to rather than try to read a mass of scattered and often difficult literature yourself?

The first workshop was held at 41 Queen's Gate on 20<sup>th</sup> April 1977, under the title “Current Research on the Evolution and Genetics of Butterflies”, and proved to be a great success (Huxley & Vane-Wright, 1977)—so much so that there was an instant demand for a further meeting, held eight months later in December 1977, on “Ecology and Evolution of Butterflies” (Vane-Wright, 1978). Both

meetings were attended by about 80 very enthusiastic people, and by the end of the second meeting (organised by Jeremy Thomas) it was clear that there was a demand for further events. By the end of the third meeting, held in September 1978, the emergent special interest group had decided to call itself the Butterfly Research Association—and, more significantly, was already “planning an international symposium on the evolution and biology of butterflies for 1982 [sic]” (Turner, 1979). Two further ‘BRA’ meetings were held, in October 1979 (Burton, 1980), and in November 1980 (Howse, 1981).

### London, 23–26 September 1981

A rather odd series of events then led to acceleration of the first international conference on the biology of butterflies, which took place during September 1981. In 1979 Dick had formally approached the Royal Entomological Society to see if they would sponsor a 4 or 5 day event, to take place in 1982, as part of the Society's regular biennial symposium series. The proposal was not well received. The Society was understandably nervous about the costs of such a large venture. Moreover, the Society at that time catered largely for professional entomologists concerned either with insects as model organisms for general disciplinary studies, or groups that had major impacts on humanity, such as locusts, aphids and biting flies.

Butterflies, a group of Lepidoptera strongly associated with the interests of the amateur fraternity, no longer sat well with this dominant culture. This was so despite the prominence at the time of great scientists such as Miriam Rothschild and Sir Cyril Clarke, who regularly used butterflies in their research. Disappointed, Dick turned his attention elsewhere, notably plans to support the work of recently arrived PhD student Ian Kitching. This involved the need for extensive fieldwork in the Malay Archipelago to be carried out in August–October 1980, following attendance at the International Congress of Entomology in Kyoto, and a visit to China *en route*. But just a few weeks before leaving for Beijing, in June 1980, Dick was approached by the Society—which had suddenly found itself without any proposal for that year's expected biennial symposium.



Following early work on *Maniola jurtina* reported at the 1981 symposium, Paul Brakefield, organiser of the 4th ‘BoB’, established the African mycalesine *Bicyclus anynana* as a butterfly ‘Drosophila’ now used in biology laboratories around the world. Photo © Yale University; image created by William Piel and Antónia Monteiro.

Reluctantly the Society had already accepted that organising a symposium for 1980 was by then impossible, but insisted that if the butterfly event were to go ahead, it must do so by September 1981 at the latest. Even so, with less than 15 months to arrange such a large and novel meeting, and being about to leave on a 13-week overseas trip, the sensible thing would have been to refuse. But this seemed like too good an opportunity to miss. And with the Society now keen to support any reasonable scheme, some concessions could be extracted. It was agreed that the meeting could be up to four days long, twice the length of the Society's normal symposia. However, the key to success lay in the fact that Dick was able to call on Phillip Ackery to carry almost the entire load of initial organisation. Following frenzied discussions in July 1980 about the structure of the meeting and who to invite, Phillip undertook the groundwork with his usual understated brilliance. By the time Dick returned at the end of October, it was clear that the programme was viable. In the end, the meeting was a vibrant event, with almost 150 registrants, and very well received (Anonymous, 1982).

However, the anticipated symposium volume, originally intended for 1982, was long delayed—largely due to waiting, in vain, for one of the key contributions. The main speakers and their topics had been chosen with the intention of covering the field of organismic biology, and to go without any of the plenary presentations involved great reluctance. As the costs of the meeting had been greater than the receipts, the delay in publication and potential loss of sales were of great concern to the Society. Publication in large format, so different from the Society's modest symposium volumes of the past, also caused consternation.

When it finally appeared (Ackery & Vane-Wright, 1984), even though not immune from criticism (e.g. Gall, 1987), the hardback proved a great success—in terms of sales, it did better than any previous volume in the *Symposia of the Royal Entomological Society of London* series, and was reprinted by Academic Press, with minor corrections, in 1985. Moreover, thanks to Phil DeVries, a paperback edition was later published in the USA (Ackery & Vane-Wright, 1989). Even so, more than a decade was to pass

before the idea of having a second biology of butterflies symposium took wing.

### **Stockholm 10–12 October 1994 – a new beginning**

In about 1993 Sören Nylin found himself talking to Bengt Karlsson about how strange it was that there were no meetings dedicated to basic research on butterflies. Both were recently graduated PhDs at the University of Stockholm, and had heard stories from their supervisor Christer Wiklund about the 1981 London meeting “where “everyone” was present” (Nylin, 2010). But since then little seemed to have happened, at least with respect to butterfly meetings in Europe, and the two thereupon decided to organise a new event.

In Sweden there is a tradition of yearly gatherings for ecologists, the *Oikos* meetings, and Sören and Bengt thought that the simple way they were then organized would be a good and manageable model. They decided on an event to last three days, with no parallel sessions, and no proceedings to be published. Moreover, delegates were invited, with a bit of guidance, to find their own food and lodgings in Stockholm.

But would anyone else really be interested? They sent out their first circular, with 10–12 October 1994 as the suggested date. The response was very encouraging, and they became committed. The next step involved inviting some well-known people, with the implication that extra funding would be needed to keep registration costs low.

As Sören (Nylin, 2010) recalls “. . . this was the decisive point; this was when the Stockholm meeting became *Biology of Butterflies II*, even though it was in fact *Butterfly Ecology and Evolution I*. After all, the London meeting was a one-off thing, and over a decade had gone by since . . . However, to get financial help from the Swedish Research Council and the Wenner-Gren Center Foundation, we had to pretend to be organizing a meeting that was part of a series, so that it was Sweden's turn to do its duty (this was part of their funding rules). Not being sure that actually starting a series was OK for getting the grants, and not knowing if there would ever be a next meeting, we decided that the series started already in London 1981.”

With Carol Boggs, Paul Brakefield, Mamuro Watanabe, Konrad Fiedler, John Thompson and Dick Vane-Wright already signed up to give keynote talks, Sören and Bengt asked their senior colleagues Christer Wiklund and Olof Leimar to co-sign the applications for funding. Not only was the money obtained sufficient to pay the travel costs of the invited speakers, enough was left over to buy the department a freezer that is still in use today! (Nylin, 2010).

As the meeting approached, with over 120 delegates expected, further developments occurred. The department had a testimonial grant fund that could be used, and Naomi Pierce was invited to give a special Ester Lager lecture, to take place immediately after the main meeting ended. In addition, Ilkka Hanski organized a satellite meeting on “Butterfly Population Ecology & Dynamics”. This was held before the meeting—remarkably, in part on a return ferry journey between Stockholm, Turku (Finland) and back.

The meeting comprised 43 talks, including 8 plenary presentations, and 35 posters. The conference dinner took place on the first evening, “and featured singing at the tables in the traditional Scandinavian way, and a very funny spontaneous talk by Mike Singer” (Nylin, 2010). Following the last day of the main event there was a morning excursion to Uppsala, and to Linnaeus's home at Hammarby. Brilliant autumn weather made for a most enjoyable trip. This was followed in the afternoon by the last act of the whole conference—Naomi Pierce's special lecture, on “Ants, Plants and Blue Butterflies”.

### **Crested Butte, Colorado, 15–19 August 1998**

During the Stockholm meeting Carol Boggs and Ward Watt had risen to the challenge of organising another meeting in the series. Working in collaboration with Paul Ehrlich, Carol and Ward put together the Third International Butterfly Ecology and Evolution Symposium, held at Crested Butte, Colorado, 15–19 August 1998. Over 140 researchers attended the event, from 19 different countries representing every continent (except Antarctica!) (Boggs, 2010).

As e-mail was by 1998 already in wide use, an electronic database of participants was constructed to

# 5th International Conference on the Biology of Butterflies



Villa Mondragone, 2 - 7 July 2007  
Tor Vergata University, Roma, Italy

## Organising Committee:

Valerio Sbordoni  
Donatella Cesaroni  
Renata Landotti

## SYMPOSIA

A symposium in honour of Lincoln Pierson Brower

Organizers: K. Oberhauser, M. Boppre and D. Vane-Wright

Evolution and development of colour patterns

Organizers: P. Beldade and A. Monteiro

Developmental plasticity, hormones and Evo-Devo

Organizer: P. Brakefield

Life histories: ecology and evolution

Organizers: B. Zwaan and K. Fischer

Recent developments in the phylogeny of butterflies and their relatives

Organizers: N. Pierce, A. Brower and A.V. Lucifreitas

Mimicry and Evolution of the Heliconiinae and Ithomiinae

Organizers: J. Mallet, C. Jiggins and W. Owen McMillan

Mechanisms of speciation in butterflies

Organizers: D.D. Kapan, M. Kronforst and C. Jiggins

Ecology and Conservation of Large Blue Butterflies (Maculeinae)

Organizers: P. Nowicki and J. Settele

Ecology of parasitoids of butterflies

Organizers: S. van Nothhuys and C. Stefanescu

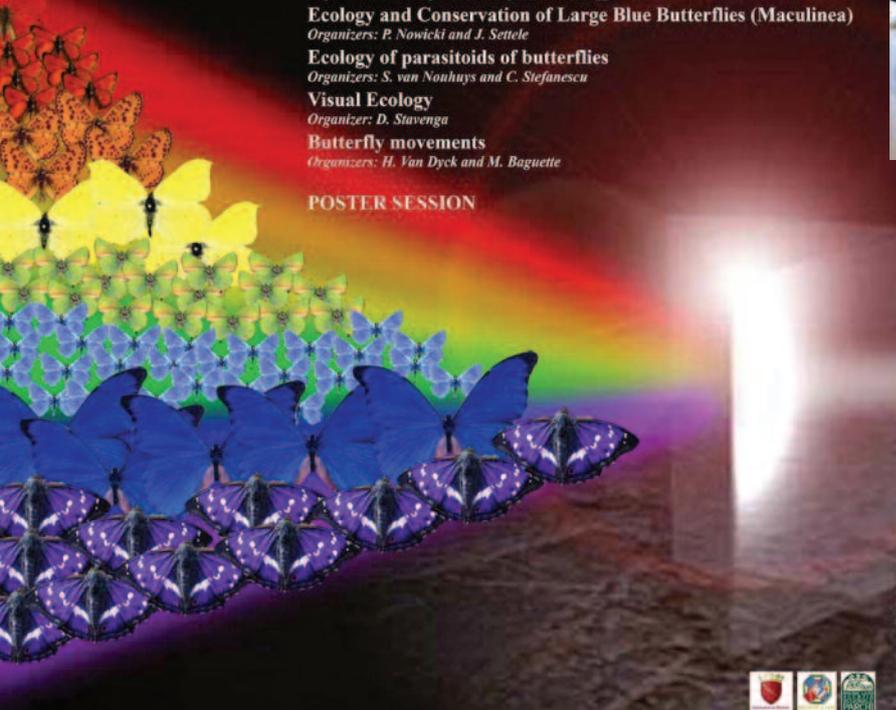
Visual Ecology

Organizer: D. Stavenga

Butterfly movements

Organizers: H. Van Dyck and M. Baguette

## POSTER SESSION



Images from the 2007 symposium: the audience. Organiser-in-Chief Valerio Sbordoni is in blue-checked shirt, front row. From: <http://biobutterfly2007.uniroma2.it/Conference.htm>

researchers—even now mostly located in North America or Europe—unlikely to have ready funds for inter-continental travel (Boggs, 2010).

### Leiden, 23–27 March 2002

The Fourth International Conference on the Biology of Butterflies was held during 23–27 March 2002, at Leeuwenhorst, near Leiden (Brakefield, 2010). Plenary talks were given by Carol Boggs, Doekele Stavenga, Sean Carroll, Fred Nijhout, Jeremy Thomas, John Thompson, Chris Thomas, Jim Mallet, Andy Brower and Carla Penz. Major topics included reproductive strategies, vision, development, genetics of mimicry, social parasitism, co-evolution, climate change, origins of diversity, molecular systematics and phylogenetics. Two parallel sessions accommodated 55 other talks that, along with many posters, emphasized the excitement and sheer diversity of work then being pursued on butterfly biology. Bob Pyle gave an extensively illustrated evening presentation on the Monarch. The main meeting was followed by a final symposium on March 28th of the European Network FRAGLAND on metapopulation biology, co-ordinated by Ilkka Hanski. A total of 184 delegates registered for this very successful meeting. See also Lewis & Bryant (2002).

### Rome, 2–7 July 2007

At the Fifth International Conference on the Biology of Butterflies, the focus was again on developments in biology

facilitate further communication among delegates, and to help any future meeting organisers. At Colorado the late Charles Remington served as honorary President—paralleling the dedication to E.B. Ford made at the London symposium. Talks were held in plenary sessions so that all presentations, as well as posters, could be appreciated by everyone. Topics ranged from ecology through the emerging field of evo-devo to genetics and conservation biology. The conference banquet was held at Mt Crested Butte.

Talks presented at the meeting, along with selected poster presentations, were updated and expanded as chapters in a major book published by the University of Chicago Press, edited by Carol, Ward and Paul (Boggs, Watt & Ehrlich, 2003). The 26 chapters are organized in broad disciplinary areas, addressing the use of butterflies in the study of behaviour, ecology, genetics, evolution, systematics, and conservation biology. As such, it is so far

only the second proceedings to be generated by the biology of butterflies series. The long 'gestation' times of both of these volumes indicate the difficulties faced in gathering together and publishing such diverse materials, even though they are nominally all on a single topic.

For the Colorado meeting partial funding for graduate students and researchers from developing countries was obtained from the US National Science Foundation. The small but useful residual funding from registration went to support needy attendees at later meetings. During the last plenary at Crested Butte, Paul Brakefield volunteered to organise a meeting in The Netherlands. A view emerged that these symposia should alternate between Europe and North America, at a minimum, with forays into Latin America, Asia, Australia and Africa if and when an opportunity arose. The rationale was to allow participation on at least an occasional basis by the majority of those butterfly

achieved using butterflies as model organisms for research—particularly in evolutionary biology. Masterminded by Valerio Sbordoni in collaboration with Donatella Cesaroni and Renata Landotti and a local organising committee, the event took place at Villa Mondragone, the beautiful conference venue of Tor Vergata University, Rome, during 2–7 July 2007. Over 140 participants registered for the event (<http://biobutterfly2007.uniroma2.it/Lista.html>). The 11 separate symposia that made up the conference are listed on the striking conference poster, with details still available on the conference website (<http://biobutterfly2007.uniroma2.it/program.htm>). One of the symposia, in honour of Lincoln Brower's 75<sup>th</sup> birthday, was made possible through generous joint sponsorship, including funds from the RES (Fink & Vane-Wright, 2007), in part reflecting the importance of Lincoln's major contribution to the 1981 meeting.

#### **Edmonton, 29 June–2 July 2010**

The Sixth International Conference on the Biology of Butterflies took place in 2010, 29 June–2 July, at Edmonton, Canada. Sponsored by the Department of Biological Sciences, University of Alberta, and chaired and organised by Felix Sperling and Jens Roland together with a six-strong organising committee, the meeting attracted 205 delegates from over 23 countries. An exceptionally diverse assortment of oral and poster presentations made the conference academically stimulating and intellectually engaging. The very extensive programme can still be downloaded through the conference website (<http://icbb2010.biology.ualberta.ca/index.html>). Based on the long-standing theme of the biology of butterflies symposia, focus was again on recent developments in biology that rely on butterflies as research models, particularly in ecology and evolutionary biology. Following the conference, Jens Roland led a well-attended tour to the Kananaskis region of the Alberta Rocky Mountains.

#### **Turku, Finland, 11–14 August 2014 – and the future**

The Seventh International Conference on the Biology of Butterflies will be hosted by the Department of Biology, University of Turku, Finland, during

11–14 August 2014, with Niklas Wahlberg in collaboration with Marjo Saastamoinen (University of Helsinki) acting as the principal organisers, with Chris Wheat (Stockholm University), Patrícia Beldade (Instituto Gulbenkian de Ciência) and André Freitas (Universidade Estadual de Campinas) acting as co-organisers of the scientific content. The conference will continue to follow the tradition of presentations in all fields of biology with butterflies as the focal study organism. Morning sessions will cover four major topical issues, and two parallel afternoon sessions will accommodate contributed talks. A field trip to visit the famous *Melitaea cinxia* metapopulation in the Åland archipelago is also being planned. Registration will be possible from early 2014 via the conference website (<http://nymphalidae.utu.fi/icbb2014/organization.html>).

*The Biology of Butterflies* (Vane-Wright & Ackery, 1984, 1985, 1989) proved influential, with several of the papers widely cited in the following decade—and some still cited today. In addition to those already feted and well known by 1981, many of the younger participants went on to become leading names in butterfly biology—Naomi Pierce and Paul Brakefield to mention just two among the contributors to the 1981 conference. Subsequent conferences have propelled many others into the “butterfly biology limelight”. Indeed, the conferences have proved to be an excellent venue for budding researchers to meet many famous biologists in fields as diverse as ecology, evolution, systematics and genetics, in a very relaxed atmosphere, which has led to new collaborations. However, the real achievement is that the seeds sown unwittingly by Dietrich Schneider almost 40 years ago have finally grown into a thriving and permanent commitment to charting and encouraging progress in our scientific understanding of these most charming, charismatic and endlessly fascinating insects—the butterflies. If you want to be part of that ongoing tradition, do register for Turku 2014. And, with the study of butterfly biology long established in Japan and Australia, and growing rapidly in South America and Asia, can we look forward to “2018” somewhere outside Europe or North America?

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