

## From the ants of the world – Belated congratulations for E.O. Wilson's 75<sup>th</sup> birthday

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To have good ideas is difficult enough, as most of us know. To turn out one good idea after the other, to transform these ideas into practicable scientific experiments, to have the results published in renowned journals and to become a well-known expert in a small field of science is even more difficult. To do so on regular basis for more than 50 years and to inspire not only a handful of fellow specialists but to advance new fundamental ideas in a number of different fields of biology is quite exceptional. Edward O. Wilson manages this all quite well and continues to do more.

Ed Wilson's name is inseparably linked with a number of ground-breaking achievements in ecology, behavioural ecology, and entomology. Again and again he surprised the community of social insect researchers by simple, well-designed experiments and detailed observations, which clearly documented or foresaw, for example, the importance of chemistry in ant communication, the ergonomics of polyethism and polymorphism, and the importance of invasive ant species. There is a good chance that something about ants you believed to be eternal knowledge was in fact discovered by E.O. Wilson some forty years ago. And his fascination is still with ants, as documented by one of his latest books, the 818 page compendium on the genus *Pheidole*, where he characterizes 625 species, including 341 new to science (WILSON 2003a), or by his recent short communication in *Nature* on early ant plagues in the Caribbean (WILSON 2005).

With all the enthusiasm for social insects Ed Wilson never lost sight of general biology. He understood well to transform his observations into meaningful concepts that, together with Bill Hamilton's view of a gene-centred selection, became the foundations of sociobiology. Much has been written about the controversy that was immediately stirred up by this new way of thinking about social behaviour, and in particular human social behaviour, and it is not necessary to review all the claims that have been made of reductionism, naturalistic fallacies, ethnocentricity, and Panglossian adaptationism. To biologists today, the sharp and often excessively aggressive rejection with which sociobiology was met by some intellectuals might seem to be best understood in the context of the political climate in the late 60s and 70s (SEGERSTRÄLE 2001). Looking back from the early 21<sup>st</sup> century, Ed Wilson's (1975) "Sociobiology" clearly stands out as one of the most influential achievements in behavioural ecology and evolutionary biology of animals in the second half of the last century. Nevertheless, much of what "Sociobiology" states about human behaviour still remains provocative and contro-

versial. This is evidenced by some rather critical reviews his newer book "Consilience: the Unity of Knowledge" (1998) received, where he repeated and extended some of the claims from his earlier books. It is probably also reflected in the way how evolutionary psychologists shy away from referring to sociobiology, though their claims about the biological basis of human behaviour sound quite familiar to readers of the books by Ed Wilson and other sociobiologists.



E.O. Wilson (photograph by Dong Lin).

In "Sociobiology", and already in "The Insect Societies", Ed Wilson managed to explain inclusive fitness theory to a broad audience of scientists, who otherwise might have missed the importance of Hamilton's 1964 twin papers for understanding social evolution. The translation of inclusive fitness theory into non-mathematical terms, together with the growing applicability of molecular methods for genetic analysis, triggered an enormous increase in genetic

research on colony structure and the partitioning of reproduction. Much of the social insect research that recently found its way into the most prestigious science journals focuses on genetic aspects of cooperation and conflict and derived concepts, such as worker policing, sex ratio biasing, and reproductive skew. Though Ed Wilson's empirical research emphasizes more the cooperative and superorganismic aspects of ant societies, several of his studies have foreshadowed this current focus on conflict and conflict resolution. In a paper published in the "Annals of the Entomological Society of America" in 1974, he carefully reported mutual aversive behaviour among ant queens in colonies of what is now *Temnothorax curvispinosus*. Rather than following the prosaic tradition to refer to individual ants as queens "Red-Blue", "B", or "14", he named his heroines "Ann", "Beth", and "Gert". This personalization might be a clear indication of Ed Wilson's fondness of ants, which he considers not as anonymous research systems but as inordinately successful and fascinating examples of evolution. A number of ant researchers have thanked him for this "enthusiasm" in their own special ways – I know of at least two ants named after Ed Wilson, *Aphaenogaster wilsoni* CAGNIANT, 1988, from Morocco and my own contribution, *Leptothorax wilsoni* from Mt. Monadnock in southern New Hampshire, i.e., from the backyard of his lab at Harvard University (HEINZE 1989).

In addition to countless original papers and commentaries on ants, Ed Wilson has written more than a dozen books, of which "On human nature" (1978) and, together with Bert Hölldobler, "The Ants" (1990), earned him the prestigious Pulitzer Prize twice. Teaming up with the eminent ecologist Robert H. MacArthur, Wilson proposed the theory of island biogeography, which he later tested with his own data on the Polynesian ant fauna and, together with Daniel Simberloff, by wrapping six small mangrove islands in plastic, fumigating them with methyl bromide, and later trapping newly arriving colonizers. Together with Charles Lumsden, he set out to more explicitly explore socio-biological concepts about human nature and to lay the foundations for solid theories of gene-culture coevolution. And in the last decade of the 20th century, Ed Wilson managed to pass on his views about the importance of biodiversity to the public, including a number of influential politicians. This has led to a (hopefully not only temporarily) increased awareness of habitat destruction, in particular in the tropics, and to detailed plans about how to rescue the diversity of nature, culminating in the ambitious proposal of cataloguing all extant species in an "encyclopedia of life" within the next few decades (WILSON 2003b).

For those particularly interested in ants, the most meaningful publication in Wilson's oeuvre is certainly the 1990 tome "The Ants", the distillation of many years of joint research both in the field and on the same floor of Harvard's Department of Organismic and Evolutionary Biology together with the world's other leading ant researcher, Bert Hölldobler. In the late 80s, the two set out to review information on all topics of the life history of ants, and after sifting through hundreds or perhaps thousands of original publications from the late 19th century onwards they succeeded in publishing this 730 page "ant-hology". This book contains not only virtually all that was known about ants in 1990, but it was at the same time written in such an elegant prose and illustrated with such eye-catching colour

prints and drawings that it was immediately considered an outstanding piece of scientific writing and was awarded the Pulitzer prize. The smaller excerpt, "The Journey to the Ants", was also highly praised and is now available in translations in several languages, including French, German, Czech, Finnish, and Italian.

During my own stay at the OEB labs as a postdoc some 15 years ago, I had the opportunity to experience Ed Wilson as an inexhaustible well of new ideas and suggestions for new experiments – and there were so many of them that some projects had to wait and are probably still waiting to be done. I remember I brought back two large plastic garbage bags of leaf-litter from my fieldwork at Mt. Monadnock so he could do a "cafeteria experiment" on the diet *Leptothorax* favour. These bags are probably still waiting somewhere in Harvard University and they or newer sacks will one day serve their purpose to fill one more gap in our knowledge on the habits of ants. I am quite sure that more species descriptions, break-through observations, and revolutionary new ideas will be forthcoming from Ed Wilson in his 76<sup>th</sup> year and beyond.

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