Hubert (Jim) Markl 1938–2015

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Received: 22 January 2015 / Accepted: 22 January 2015 / Published online: 13 February 2015
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Hubert Markl was born August 17, 1938 in the Bavarian city Regensburg. As a boy, his school friends called him Jim, and this name stayed with him throughout his life. He was a brilliant student and the recipient of a special stipend from the Bavarian State which enabled him to study biology, chemistry, and geography at the Ludwig Maximilian University of Munich. Among his academic teachers were Karl von Frisch, Hansjochem Autrum, Konrad Lorenz, Erich von Holst, Feodor Lynen, and Martin Lindauer, who also served as his thesis advisor. When he received his doctoral degree (Dr. rer. nat) with summa cum laude, Hubert Markl was 24 years old. Soon afterwards (1963), Martin Lindauer accepted an offer as Full Professor and Director of the Zoological Institute of the Johann von Goethe University in Frankfurt, and he invited Hubert Markl to follow him as a scientific assistant (assistant

professor). This time in Frankfurt was interrupted by 1 year as a research fellow at Harvard University and Rockefeller University where Donald Griffin was his host and made it possible for him to work at the tropical research station in Trinidad. During his research residency in the USA, his American colleagues were so impressed by his presentations and brilliant discussions that he received offers for tenure track positions from Cornell University and the University of California, Berkeley. He decided to stay in Germany, and in 1968, he accepted a professorship and chair at the Technical University of Darmstadt where he stayed 6 years. In 1974, he accepted a position as Professor of Biology at the University of Konstanz, and although he had attractive offers from other institutions, including his alma mater, to succeed Hansjochem Autrum on the chair formerly held by Karl von Frisch, he decided to stay in Konstanz.

Jim Markl and I knew each other for 50 years, and soon after our first meeting, at a scientific conference in Graz (Austria), we became friends. We were both “scientific assistants” in the Department of Zoology chaired by Martin Lindauer at the University of Frankfurt, and our mutual scientific interests and close friendship continued after our paths parted. Even after I had immigrated to the USA to accept a professorship in the Department of Biology of Harvard University, we retained close academic and personal contact.

It was in July or August 1975 when Jim joined me for field work in Arizona. We were sitting on the porch of our cottage in Cave Creek Ranch in Portal and discussing the need for a new journal that covered the rapidly growing fields of behavioral ecology and sociobiology. We tossed around several tentative titles for such a new journal and finally decided for the double name, the acronym of which is BES. We already had explored whether Springer-Verlag would be interested to be the publisher of such a new journal, and indeed, the response was very encouraging. Hubert Markl agreed to serve as managing editor; John Crook, Hans Kummer, Edward O. Wilson,

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and myself functioned as co-editors. Karl von Frisch wrote a gracious foreword for the first issue of BES published in 1976, in which he states “We do not have to worry about the future of the new child..., the editorial responsibility lies in the best hands.” Indeed, it is almost entirely due to Jim’s vision and tremendous efforts that this journal became one of the leading journals in behavioral biology. He served as managing editor from 1976 to 1987.

Hubert Markl was an outstanding scientist. The meticulous morphological study of hair plate sensilla which function as proprioceptors in ants, bees, and wasps, and the experimental demonstration of the significance of these trichoid sensilla for orientation with respect to gravity belongs to the very best studies in insect sensory biology. Equally impressive was his detailed analysis of the peripheral nervous and muscular systems in the thorax of *Apis mellifera*, *Formica polyctena*, and *Vespa vulgaris*.

Hubert Markl’s detailed analyses of vibrational cues and signals in animal orientation and communication are masterpieces. Although it has been recognized for more than 100 years that ants of the subfamily Ponerinae, Myrmicinae, and Myrmecinae can produce stridulous sounds by moving the sharp posterior rim of the third abdominal tergite over a fine-ribbed area on the front of the fourth abdominal tergite, not much was known about the physical quality of the sound that is produced nor the biological function. In a series of excellent experimental analyses, Hubert Markl brilliantly demonstrated that leaf-cutting ant workers of the genus *Atta* stridulate whenever they are prevented from moving freely, that nest mates do not perceive the airborne stridulation sounds, but instead are extremely sensitive to ground-conducted stridulation vibrations, and that in appropriate contexts, these vibrations function as alarm signals. The analyses of the biomechanics of the production and the physical characterization of the stridulation signals combined with the determination of the sensitivity of signal reception in leaf-cutting ants are truly milestones in the exploration of insect communication. Together with several students and postdocs, Hubert Markl investigated a broad spectrum of questions concerning production, reception, and function of vibrational cues and signals in a variety of invertebrates, and even some vertebrates, such as Piranhas and mice.

Although most of Hubert Markl’s scientific work belongs to the domain of sensory and behavioral physiology, his true love was empirical sociobiology and behavioral ecology. His chapter on “Manipulation, modulation, information, cognition: some of the riddles of communication” published in 1985, in a book dedicated in memoriam Karl von Frisch, is one of the most insightful and inspiring papers on animal communication I have read. Today, 30 years later, in a time when “the wheel is rediscovered” again and again, it is very worthwhile to read this stimulating article. Hubert Markl was the first who clearly conceived the concept of modulatory

signals in animal communication. He and his students presented the first evidence in support of this concept, and I greatly benefited from that insight because it enabled me to better understand the function of multimodal signals in ant communication which I began to investigate in the early 1970s. I had the tremendous pleasure to collaborate with Jim Markl investigating the role of vibrational signals in *Novomessor* and *Pogonomyrmex* harvester ants during foraging and mating.

I could not resist to regret many times that this original and enormously gifted scientist decided to give up experimental science and focus his energies on his other superb talent: science management and science politics. I do have to admit, however, we all benefited tremendously from this decision. Hubert Markl was one of the most significant and effective science organizers in Germany, and his impact on science politics was recognized and admired worldwide. He was a member of the senate of the German Science Foundation (Deutsche Forschungsgemeinschaft, DFG), became vice president of the DFG, and, from 1986 to 1991, served as its president and vice president of the Alexander von Humboldt Foundation, simultaneously. Subsequently, he became founding president of the Berlin-Brandenburgische Academy of Sciences and Humanities. Finally, from 1996 to 2002, Hubert Markl was president of the Max Planck Society where he initiated many innovations and new institutes, especially in the former East Germany. In a statement published by the Max Planck Society, Markl is characterized as “... a man who never took the easy way out, who made his feelings known with wit and eloquence.” Hubert Markl took the helm of the Max Planck Society 6 years after the German reunification. In order to invest in and establish new research institutions in former East Germany, funds for existing Max Planck Institutes in the West had to be cut. The Max Planck Society recalls: “In a tremendous act of will, the new President reduced or closed departments and institutes, but he was able to set new courses in research with the appointment of 153 Directors”. Hubert Markl’s successor as president of the Max Planck Society, Peter Gruss, characterizes Markl’s forceful moves “an impressive push towards rejuvenation for the Max Planck Society.”

Hubert Markl was a gifted, charismatic, and demanding university teacher, who deeply cared for his students. His concern for the next generations of scientists was also crucial for his agenda as president of the Max Planck Society. He urged his brilliant Max Planck Society colleagues to get involved in undergraduate teaching at neighboring universities, and he founded the International Max Planck Research School.

When Hubert Markl took the helm of the Max Planck Society, he realized that this distinguished society had not come to terms with its past. In 1999, he appointed an independent presidential committee of historians to investigate the involvement of the Kaiser Wilhelm Society, the predecessor society of the Max Planck Society, in medical experiments undertaken

in Nazi concentration camps. At the halfway point of this investigation, it was shockingly obvious that some scientists of the Kaiser Wilhelm Society were involved in the expulsion of Jewish colleagues, and the historians had produced hard evidence that as Markl expressed it, “proves beyond the shadow of a doubt that directors and employees at the KWS co-masterminded and sometimes even actively participated in the crimes of the Nazi regime.” On behalf of the Max Planck Society, Hubert Markl apologized to the victims and for “a lack of willingness on the part of (some) inside and outside the Max Planck Society to face up to their historical responsibility” (cited from Alison Abbot, *Nature*, June 11, 2001).

There was no topic too controversial for Hubert Markl to express his view in eloquent speech or sharply argued essays published in the leading newspapers, science journals, or in books. He wrote or edited a total of 10 books!

Hubert Markl received numerous prizes and medals and seven honorary degrees. He was an elected member of several national and international academies; among them, the Heidelberg Academy of Sciences, the Bavarian Academy of Sciences, the German National Academy of Sciences Leopoldina, the Academia Europaea, the Indian Academy of Sciences, the Polish Academy of Sciences, the American Academy of Arts and Sciences, and the Royal Society of Sciences London.

Hubert Markl died on January 8, 2015, in Konstanz.