Horst Prinzbach

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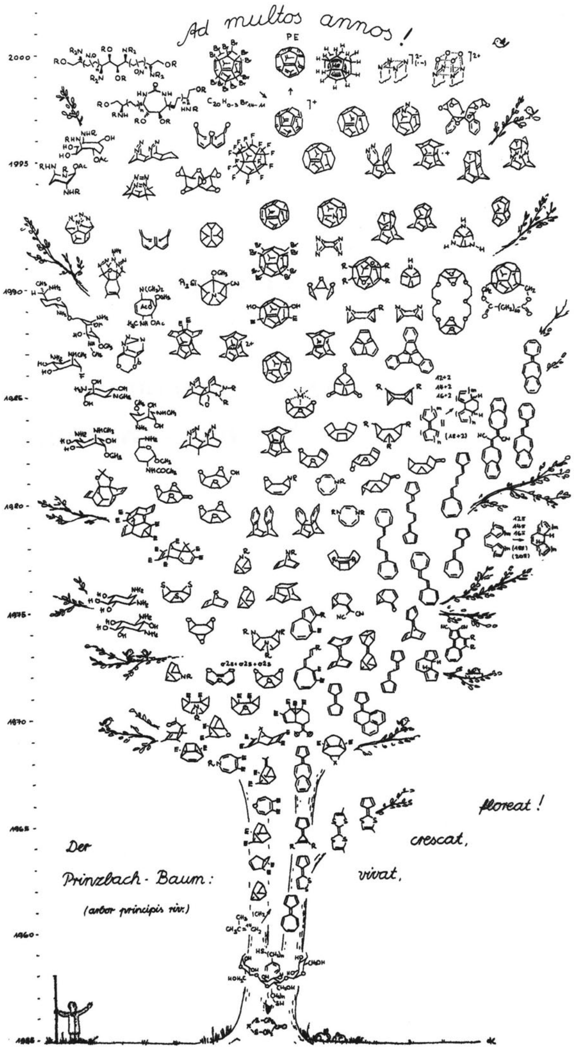
Horst Prinzbach, emeritus professor at the Institute of Organic Chemistry at the Albert-Ludwigs-Universität Freiburg, surprisingly passed away at the age of 81, after a short but serious illness, on September 18th, 2012. The scientific community has lost a distinguished chemist who significantly influenced the post World War 2 chemical landscape in Germany.

Prinzbach was born and raised in Haslach im Kinzigtal (Black Forest, Germany). Despite his traditional education and the prospect of joining his father's concrete goods factory, he decided to study chemistry in Freiburg. After completing of his diploma and PhD theses (1955) with A. Lüttringhaus on organolead and sulfur heterocyclic compounds, respectively, he was awarded a US National Academy of Sciences scholarship and joined the group of W. von Eggers Doering at Yale University for a period of two years, where he studied the mechanism of carbene insertion into C–H bonds. Inspired by Doering's work on the tropylium cation (structure elucidated in 1954), he began his own research towards the cross-conjugated sesquifulvalene upon his return to Freiburg. This pioneering work allowed him to complete his habilitation in organic chemistry in 1962. Three years later, he was offered a professorship at the University of Lausanne (Switzerland), however without having to abandon the laboratories in Freiburg. His scientific reputation, acquired with the help of a fast-growing number of productive assistants and colleagues, led the University of Freiburg to offer him a Chair in Organic Chemistry in 1969, where "HP" (his distinctive signature, also on laboratory equipment) stayed until he received emeritus status in 1999.

The research topic "chemistry of nonbenzenoid aromatic compounds", started in his habilitation period and becoming increasingly internationally competitive, proved to be self-supporting for the group for another two-and-a-half decades, covering multifaceted preparative–synthetic, analytical, and theoretical aspects of pericyclic multielectron cycloadditions and electrocyclizations, and producing ever-expanding vinylogous π- and annulated ring systems. Experience in photochemical methods also obtained at Yale stimulated simultaneous work on photoisomerizations of nonconjugated dienes, especially involving norbornadiene, which just had become industrially available, and homoconjugated σ homologues or bridged cage compounds. Such research could be rapidly transferred to variously substituted and heteroanalogous systems as well as to their consecutive thermochemical reactions—wide-ranging playgrounds to challenge the then young Woodward–Hoffmann rules. The multibridged product structures derived from those photochemical conversions often showed complex and strained bond arrangements that with time developed into a quasi trademark of Prinzbach's research. Visitors to his office were impressed by a trophy collection dangling from the ceiling that displayed models of "his" molecules, mostly unusual polycycles having amazing three-dimensionally linked ring constructions, many with significantly distorted bonding geometries, but also some with exorbitantly high symmetry. In this context, he enjoyed pointing out the numerous pertinent entries in the monograph *"Organic Chemistry—The Name Game"*, smiling proudly because the one discovering or synthesizing the target first had the traditional rights to create an original trivial name.

From the early 1970s, extensive studies in his group focused on the synthesis and thermally allowed pericyclic 3σ→3π isomerization of tris-σ-



homobenzenes, among which the "*cis*-benzenetrioxide" played a key role for preparative utilization. Regio- and stereoselective epoxide opening by using different nucleophiles not only opened up pathways to the highly strained $(CH)_8$-isomeric octabisvalene and its diaza analogue, but also allowed for a highly productive entry to the synthesis of aminocyclitols as components of aminoglycoside antibiotics. This research resulted in a large variety of building blocks for the total synthesis of natural active compounds and their non-natural analogues, and established the use of biocatalytic methods in the group early on for the resolution of racemic intermediates.

Photochemical problems inspired the quest for suitably bridged candidates that enable intramolecular photocycloadditions of juxtaposed N=N as well as benzene chromophores. While polyazacages posed a particular synthetic challenge because of thermodynamically favorable N_2 elimination, $[6\pi+2\pi]$benzene/ene and even $[6\pi+6\pi]$benzene/benzene photocycloadditions could be successfully realized. The author of this obituary had the privilege to use the latter photoproduct—within the generous scope that "HP" always admitted to his students for the development of a thesis problem—as a preparative base camp and "pagodane" as an attractive intermediate in a second attempt at the $(CH)_{20}$ pentagonal dodecahedrane, the "Mount Everest of alicyclic chemistry", shortly after the first ascent by Paquette. Indeed, the efforts culminated in the proof of concept and along the way provided insights into novel bonding systems. The pagodane route to dodecahedrane, which was featured on the cover of this journal, however, opened up another "playground" for the study of unusual cage structures and of extraordinary chemistry, the appeal of which would last another two decades of intensive research. The multilayered preparative challenges of novel transanular functionalizations and explorative conversions on the convex surface of alicyclic geometric bodies generated, in addition to many attractive molecules, a multifaceted knowledge about the reactivity of cage compounds, which altogether makes up for a particular didactic lesson in the interplay of theory and empiricism, strategy and serendipity, synthetic expertise and chemical intuition, and spectroscopic skills and computational chemistry. Ironically, the ultimate scientific bombshell—generation of the fully unsaturated dodecahedrane C_{20}, the smallest possible fullerene and also a link to the nanosciences—could be realized only after his retirement. More than 370 original publications and countless invited lectures worldwide document clearly that "HP" not only had a talent for generating excellent scientific results, but also to skillfully presenting them to the market. For this he received, among several other honors, the Adolf von Baeyer Medal of the Gesellschaft Deutscher Chemiker (GDCh, German Chemical Society) in 1989.

In 2007, he published his autobiography *"Chronologie des Arbeitskreises—eine etwas andere Familiengeschichte"* ("Chronology of the Group—A Somewhat Different Family History") where he retrospectively shares both his motivations behind his research and the ups and downs of those involved, as well as an occasional look behind the scenes of the academic institutions. "HP" led an unconventional life, he remained unmarried and passionately dedicated his life to science; his research group formed his family, consisting of graduates, more than 120 PhD students as well as technical staff, whom he cared for deeply. He was a strong, charismatic personality with a fascinating dedication, which was both demanding as well as stimulating: his constant challenges sparked our ambitions; his down-to-earth optimism helped us to develop persistency.

He was a challenging mentor, who kept constantly in touch with his research team through lively weekly seminars and frequent group meetings that were both intellectually stimulating and enabled critical thinking. His passion for a controversial scientific debate was legendary, and his precise and razor-sharp arguments ensured that guest speakers in the Freiburg seminars kept lasting memories of their visit. "HP" tended to have a strong opinion about everything, however he was always an advocate of a good case and high-quality science. Beyond the scientific arena, he was particularly fond of classical music; he was a virtuoso pianist who enjoyed regular music-making sessions with members of "his family" and friends. As a means to promote musical talents even after his death, he founded the Prinzbach-Kultur-Stiftung in 2003.

"HP"'s students, colleagues and friends have lost an inspiring personality; the field of chemistry has lost an extraordinary scientist. We will all treasure the time we were allowed to share with him.

Wolf-Dieter Fessner
Technische Universität Darmstadt

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