Bosch: From the Classics to Classical Music, amid a Steadfast Focus on *Hydra*

Thomas Bosch spent his early years in Augsburg, Germany, immersed in the classics under the tutelage of Benedictine monks at a boarding school within a monastery, the same school his father had attended—and with some of the same teachers. Although science played only a minor role in the curriculum, "somehow I always felt attracted to biology, to animal behavior, and to nature," he recalls. "The monks supported that and allowed me to spend most of my spare time in the monastery's wonderful garden, breeding guinea pigs—which I sold to the pathology department in the city to earn some pocket money—bees, and roses. I enjoyed the spirit of the school greatly."

Bosch, 54, now is professor of zoology and director of the zoological institute of the Christian-Albrechts University of Kiel, where he studies molecular mechanisms controlling the development and differentiation of the cnidarian *Hydra*. "Our data suggest that ancient organisms, such as *Hydra*, hold promise for detecting novel antimicrobial molecules and treating infections caused by multi-[drug] resistant bacteria," he says.

Bosch, many of whose ancestors were dentists—his father was one—or physicians, did not begin his formal studies of biology until he went to college. As an undergraduate at the University of Munich, he won a one-year scholarship to the University College of Swansea in Wales. There he learned English, which proved a valuable addition to his earlier devotion to Latin, Greek, and philosophy. He also grew increasingly fascinated with biological systems, after being assigned to conduct research in a lab. This exposure to experimental science was unlike his experiences in Germany, where undergraduates "sit in large classes and work on ready-made school experiments," he says.

Bosch disliked the research project itself because it involved "isolating parasites from seagull feces kept in cages, and collecting ectoparasites from fish while being seasick on a research vessel," he says. Nevertheless, "I started to realize that organisms live together often in very complex and not-yet-understood relations." For example, he continues, "parasites have to take care that they do not kill the host too early—and the host has to develop defenses against the parasites. In some cases, parasites are not really harmful, and hosts seem even to like and attract them. Why? How did associations of different organisms of different origin and complexity co-evolve? Why are certain microbes associated with certain hosts? How do the organisms coordinate their interactions at the molecular level? That is, what is the molecular language in this 'inter-kingdom' communication? These are among the central questions of my research today."

When Bosch returned to the University of Munich, many classes that interested him no longer were available, with one exception. While he was abroad, the university had hired a professor for zoology and developmental biology, Charles David, from the Albert Einstein College of Medicine in New York. While conducting postdoctoral research at the Max Planck Institute in Tübingen, Germany, David "had been introduced to a simple animal model for understanding pattern formation and development: the freshwater polyp *Hydra*," Bosch says. "When I returned from the U.K. to Munich, Professor David's class was the only one not overbooked—simply because nobody knew him at that time. So I started working with him and spent the most influential years of my academic education in his lab."

Bosch finished his undergraduate work in 1983 and earned his Ph.D., also from the University of Munich, in 1986. He spent 1986–88 as a postdoctoral fellow at the University of California at Irvine doing research at its developmental biology center. "The [center] was housed in barracks and containers outside the main campus," he recalls. "The entrance hall, with shaky doors, served also as a seminar room where, at lunch time, world-famous scientists were giving talks on a regular basis. Space was very limited. It was a good example of how to establish a truly interactive environment. The structure of my lab in Kiel recalls that experience at least to some extent."

Bosch says that his current life leaves little room for non-work activities. He does enjoy traveling to deliver talks and papers, teach, and to develop scientific collaborations. For example, he has traveled many times to Russia during the last 20 years, visits he describes as "something special," particularly in watching "the transition from the former Soviet state into the Russia of today."

He and his wife, a veterinarian, have been married 23 years, and have an 18-year-old daughter. "When time allows—and my wife has organized the tickets—an evening in a classical concert is wonderful," he says. "Very rarely, I play the piano by myself at home. And since we live in a countryside house, nature is always near when I am at home."

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