



WANDERING WIKO AND BERLIN
JOHN J. RIESER

John Rieser was born in 1949 in Pittsburg, Pennsylvania. He received his B.A. from Harvard College in 1971 and his Ph.D. University of Minnesota in 1978, after teaching secondary sciences and mathematics in Botswana for two years. He is Professor in Vanderbilt University's Department of Psychology and Human Development, rising through the ranks beginning in 1978 and serving as Department Chair from 1995–2000. He was visiting scientist for extended periods at EPHE/CNRS, Paris 1986, and at the University of Minnesota 1993, 2001. Rieser's research focuses on how motor information is integrated with spatial imagery so that people come to know the changes in their perspective that result from their own actions when they locomote by foot and when they manipulate objects by hand. This research is directly relevant to how people who are blind or sighted can learn to find their way from place to place. And it has implications for the design of computer-based virtual reality systems, for how children and adults understand fiction, for how young children learn how hard to throw a ball of a given weight to reach a target of a given distance, and for what college students need to practice in order to understand scientific events such as the billions-year-old plate tectonic events that formed Lake Superior and the Alps. – Address: Department of Psychology and Human Development, Vanderbilt University, Peabody 512, 230 Appleton Place, Nashville, TN 37203, USA.

Berlin and Wiko are wonderful places to live and work. I spent the year on my own, while my wife Karen worked to establish a large new project concerning children and families back home in Nashville, my son Michael started his first year of graduate work in geology at the University of Minnesota, and my daughter Kate started her first year of college at

Harvard. In retrospect I would make the same choice again in a second, even given the developmental challenges of wife, son, and daughter, as well as the chronic frailties of my 90-year-old mother and the acute challenges of a leukemic doctoral student. In many ways, each of us were “freshmen” in our respective realms, finding exciting chances to explore new circumstances, learn new things, make new friends, and do some work. After hearing my descriptions of life and work at Wiko, Kate put it most poignantly when she noted that living at Wiko, with its chances to read and explore and learn new things at the Tuesday Colloquia, sounded like being a freshman in college except “they treat you special at Wiko, Dad”. And indeed it was special, combining the chance to explore the culture of Berlin with colleagues from near and far, while nurtured by staff serving us with administrative skill, library skill, computer skill, editing skill, and culinary skill.

In terms of work, I had the special good fortune to join with Ken Cheng, Janellen Huttenlocher, and Sara Shettleworth as a group focused on spatial cognition and its development, both for what I learned and for friendships forged during our semi-regular seminars and meals. Through the year we hammered away at identifying different ways that spatial information could be integrated into coherent representations of the world. Who could have guessed that we as a group would join forces with Horst Bredekamp to read Leibniz’s *Monadology* to check its relevance to contemporary epistemologies, especially the emphasis on the dynamics of modern cognitive psychology. Or that Peter Huttenlocher would provide tutorials on his work on brain plasticity? And although I had hoped for chances to explore Berlin’s operas and orchestras with good friends, who could have guessed how much we would learn from composer-pianist Stefan Litwin’s lecture-performances at Wiko?

The Tuesday Colloquia were special. In a few cases they were relevant to my own work, but in every case they provided food for thought and a chance to think about new things. Some were frustrating, because I could not follow the logical structure of some of the arguments made by Fellows from fields that were more literary or historical or philosophical than mine. In Wiko’s setting, however, I was led to wonder where I had missed the speaker’s point, whereas in ordinary academic settings I would have been prone to wondering where the speaker had missed the point.

My research is about the mind and the ways that experiences shape what we find relatively easy or relatively difficult to think about. I accomplished some of my goals, but not others. I gave colloquia in Jena, Zurich, Munich, Tuebingen, Berkeley, Paris, and Vancouver. I published three papers, wrote drafts of three papers, and haven’t finished three

others. I will not use this memoir as a chance to summarize these papers, but I will use it as a chance to summarize four other projects. The first is I finished my portions of a committee-based book-length report to the National Academies of Sciences entitled *Learning to Think Spatially*. The report was written by a group consisting of physical scientists and cognitive scientists who considered what kinds of thinking were needed to learn topics in geology, astronomy, and how teaching might be organized to help students understand on deeper and more general levels. Much of what is learned in the academic domains involves remembering and thinking about spatial arrangements of things as diverse as the atoms in a molecule, the locations of battlefields in a war, and the trajectories of moving bodies. And it involves understanding how these arrangements change dynamically with time – so people can visualize when, for example, molecules rotate to combine with other molecules, how HIV traveled an early path following the highways of East Africa, when troops change the position of their fortifications to counter advancing forces, and when warm air masses collide with cool ones to create storms. My portions were focused on the question of how people can learn to use visual and non-visual forms of imagery to remember such spatial arrangements and understand dynamic changes in spatial arrangement.

A second project I completed was introductory writing and editing (with Jeffrey Lockman and Charles Nelson) a volume entitled *Action as an Organizer of Learning and Development* (Erlbaum Press, 2005). This volume grew out of meetings to honor Professors Herbert L. Pick and Anne D. Pick, who visited Wiko during the winter of 2004. A central concept of the volume is that in many ways children are universal novices, such that the learning involved when adults work to become experts in a given topical domain is governed by the same processes as in children's learning of most domains. Whereas novices and younger children alike tend not to know what exactly they need to remember and think about, experts tend to know exactly what needs to be considered and to emphasize the different facts in ways that lead them to effective solutions to their problems. How is it that adults acquiring expertise and children during development figure out how to weight different forms of information in ways that will optimize success? This question forms a core of the volume. The question was inspired in part by the scientific studies of the members of the spatial cognition group, namely of: J. Huttenlocher on how human adults make decisions, of Shettleworth on how pigeons and rats learn to find food after being disoriented, of Cheng on how bees and ants find their way home to their nest after foraging for food, and of my work on how adults maintain their dynamic spatial orientation.

The third project consisted of a scientific workshop held at Vanderbilt and funded by the National Institutes of Health that will culminate in a volume entitled *Blindness, Brain Plasticity and Spatial Function*, edited together with Professors Daniel Ashmead, Ford Ebner, and Ann Corn (Erlbaum Press, forthcoming, 2006). At Wiko I wrote drafts of several chapters, some chapter authors completed their chapters, and others are continuing to work. The book's aim is to integrate recent findings from the brain sciences and cognitive sciences about the spatial functioning of persons with severely impaired vision and blindness and to consider the implications for education and rehabilitative engineering. We intend "spatial functioning" to include learning and performance related to perceiving, manipulating, and understanding objects as well as environments. Consider three main topics. One consists of research from animal models and human brain imaging, suggesting that the occipital cortex of people with vision impairment from birth is recruited in tactile and auditory processing to a greater degree than it is for sighted people who wear blindfolds. This is an example of experience-dependent brain plasticity of relatively low levels of brain functioning. Its implications relate to questions older than Molyneux's (1636) question about what, exactly, people who lose vision early in life could see if their vision were to be restored, and bridge to this year's cutting-edge sciences. A second area consists of demonstrations that non-visual information can, in some cases, substitute neatly for visual information in the control of some tasks. The questions are whether and to what degree people who cannot "see" by eye can learn to "see" by listening or touching. And the third area consists of demonstrations that visual input relatively early in life may facilitate the development of some types of non-visual spatial functioning (but not others) stemming from auditory, tactual, and motor input.

The fourth and final project is a book to be co-authored with Herbert Pick. It is tentatively entitled "The organization of perception and action". I wish I had made more progress in writing this volume. I spent my time thinking and reading recent research, and especially reading some of the historical context of the modern works. The library staff were more help than I can acknowledge in securing obtaining copies of pieces that are not widely available dating from the seventeenth century. The book, like the other works, focuses on ways in which everyday life involves adapting the features of action to fit with the immediate and future surroundings and with varying environmental circumstances. The changes in environmental circumstances that people encounter come in many forms. Some occur as a result of the snow and wind that occur with variations in weather. How is it, we ask, that people adjust their actions to accommodate to such variations? Other changing

circumstances occur in the ground surface – from grass to water to ice to concrete. How is it, we ask, that people adjust their locomotion to the slipperiness of the ground surface? And still others occur as a result of using various tools. However it happens, people adjust the forces and directions of their specific actions for variations in their local circumstances. When they do adjust a particular action to fit a particular tool or set of circumstances, the adjustments sometime generalize to other actions to use the same tool or fit the same circumstances, and yet other times there is no transfer of learning. How is it, we ask, that learning to adjust the linear and angular forces of one limb system can transfer to quite different limb systems? The second major thesis of this book is that transfer of such adjustments follows a functional organization – that is, “learning to adjust” does not follow a particular limb system, but instead it follows all limb systems brought to bear on the same functional goals with the same type of perceptual outcome.

Summary. What will I miss the most from my year at Wiko? It will not be long bike rides to the Käthe-Kollwitz-Museum, KaDeWe, Pergamon and beyond, rides where I felt safe while riding in heavy traffic because Berliners pay attention while looking in their rear-view mirrors. It will not be spotting wild boar nor hundreds of well-behaved dogs while roaming the Grunewald. It won't be *Rigoletto* at the Komische Oper, certainly not *Idemeneo* at the Staatsoper, nor even *Madame Butterfly* at the Deutsche Oper. It might be the chance for fresh friendships with warm and thoughtful individuals. It might be support from thoughtful, kind, and promising staff members. It will be the diversity of intellectual life.