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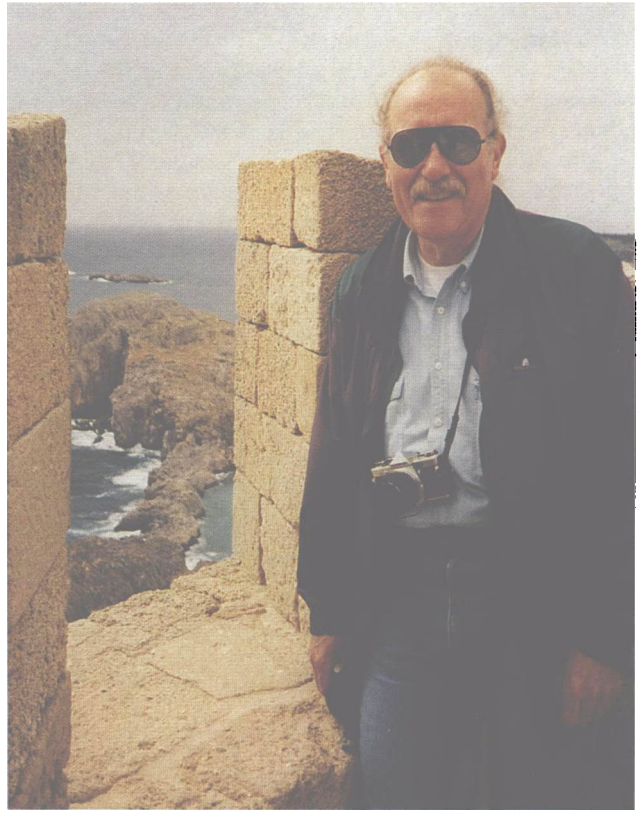
Mark Aaron Berkley, 1936–1995

Mark Berkley, Professor of Psychology and Neuroscience at Florida State University, died of a pancreatic cancer on the 6th of September after a two year illness. His personal qualities and his scientific contributions make his loss a particularly sad one to his family, his friends, and to his colleagues. Mark was a member of the Editorial Board of *Visual Neuroscience*, 1990–1992.

Mark was born in New York City in 1936. His family moved when he was a young child to Colchester, Connecticut where his father had bought a small chicken farm. Like farm children everywhere, Mark was responsible for his share of the chores on a busy farm. The demands of farm life probably contributed to his resourcefulness and competence in laboratory work. When laboratory problems were met, they were solved. He was a skilled and ingenious worker.

Mark received a B.S. degree from Trinity College and a Ph.D. degree in Psychology at Johns Hopkins in 1962. He was a Postdoctoral Fellow in the Psychology Department at Brown University with J.W. Kling from 1962 to 1964. It was at Brown that he met his future wife, Karen Greene who was then an undergraduate Biology student. Mark went on to a post-doctoral fellowship in the Department of Physiology at the University of Washington from 1964 to 1967.

Mark's early academic career reflected and shaped his interests and talents. He was a superb behavioral scientist, skilled in the use of operant techniques for the analysis of complex behavior. He pursued his related interest in brain function at Seattle. The University of Washington was then, and remains a place where the combination of behavioral and neurophysiological methods for the study of the brain was encouraged and nurtured. From 1967 to his death he was on the faculty of Psychology at Florida State University, with a sabbatical spent at the Catholic University of Leuven in Belgium in the academic year 1991 to 1992, working with Professor Guy Orban.



Mark began his research with a solid grounding in behavioral, physiological, and psychophysical methods. At the time, most of the evidence about the neural basis of mammalian vision came from studies of the receptive field properties of single cells in the visual system of cats. Psychophysical evidence came largely from experiments with cooperative human beings. Although there had been some successes in training cats, the weight of opinion held that they are at best poor subjects for behavioral study. Psychophysical evidence from human subjects might or might not agree with electrophysiological evidence from cats. If the two sources did not agree there was a ready explanation; cats are different from people. Mark's work changed all that. He demonstrated that reliable psychophysical as well as electrophysiological data could both be obtained from cats. Mark reasoned that difficulties in training were not inherent in the intellectual capacity or the willingness of cats, but in the improper techniques that had been used previously. He devised an automated test-box in which discriminations were solved by a nose push against a glass screen displaying the correct stimulus. Correct responses were rewarded with food that the cat relished. The "Berkley box" made it possible to study sensory mechanisms in cats with the same precision as had been possible with human subjects. Cats would leap with anticipation into the training box and work for hours at a visual task.

Mark's experiments were all directed at central questions of brain mechanisms in sensory processing. In early work with one of us (MG), he demonstrated that the Lateral Geniculate Nucleus projects to a much wider territory on the cerebral cortex of cats than just to Area 17. We found, for example, that small localized lesions of the lateral geniculate nucleus caused degeneration of geniculocortical fibers in area 18 which were as dense as those in the primary striate cortex. Complete ablation of area 17 left the visually evoked potentials in area 18 unchanged. These results raised doubts about the prevailing view of the time that the visual areas were connected in a series-like

manner, in which the complex receptive field properties of cells in area 18 were derived from cells with simple receptive fields in area 17.

Much of Mark's later work was devoted to analyzing the functions of these different cortical visual areas. In collaboration with another of us (JS), he applied his elegant behavioral methods to studying the effects of cortical lesions on visual functions. We knew that cats retain substantial ability to discriminate patterns and shapes after removal of primary visual cortical areas. We set out to analyze the remaining visual capacity, testing acuity, orientation, vernier alignment, and contrast sensitivity in cats with cortical lesions. We published results on all of these except the last, and were working on this when Mark became ill. He was a meticulous and ingenious experimenter who took years to collect and analyze his data before publishing them. His interpretations were scholarly and deeply thought out.

Mark had a strong and positive zest for life. He loved to ski, to hike, and to sail, as well as work in the laboratory. He was a loyal and kind friend, a supportive and deeply knowledgeable teacher, and a loving husband, colleague, and friend to Karen and father to his daughters, Lara and Tamara. His untimely death which he met courageously has left a void in our lives.

MITCHELL GLICKSTEIN
JAMES M. SPRAGUE

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