Robert C. Bolles (1928–1994)

Robert C. Bolles died unexpectedly on April 8, 1994, of a heart attack. With his death, psychology lost one of its great thinkers, writers, and wits. He helped shape an era, and his life tells that era's story very well.

Bob was born in Sacramento, California on April 24, 1928. He was stricken with polio at an early age and was schooled at home until 12. His first interest was mathematics, and he earned a BA (1948) and an MA (1949) in it from Stanford University. After a stint as a mathematician at the U.S. Navy Radiological Defense Laboratory in San Francisco, he studied psychology at the University of California at Berkeley with Edward Tolman and David Krech. Bob's early experiments showed that food-deprived rats choose alternate arms of a T-maze on successive trials but that thirsty rats stick with one arm. This research foreshadowed several later themes in Bob's career that went on to help shape the field. For example, the implication that foraging involves a win–shift strategy influenced the field of spatial memory; the idea that motivation has such selective effects on behavior underlies the contemporary behavior systems approach.

After receiving his PhD in 1956, Bolles held brief academic appointments at Princeton University and the University of Pennsylvania before settling at Hollins College in 1959. There he examined the motivating effects of food deprivation, anticipation of meals, and biological rhythms. Bob believed that simple, direct observations led to the greatest insights. Once he watched and recorded all the behaviors of rats from birth to weaning. When the resulting article was declared a "Citation Classic" by *Current Contents*, he wrote:

> I have always believed in the idea that experimenters should look at their animals...the human eyeball is the instrument of choice if you want to observe a new phenomenon, and particularly if you want to gain a new understanding of it.

This message impressed many students.

Perhaps Bolles's greatest contribution was his book, *Theory of Motivation* (1967). Written at Hollins, this masterful work synthesized a broad range of data and marked the downfall of Hullian drive theory. The book took a biological and historical perspective and emphasized the anticipation of goals, rather than the need for them, in explaining motivated behavior.

In 1966, Bolles moved to the University of Washington, where he remained until his death. At Washington, his research expanded to include the analysis of fear and avoidance for which he is perhaps best known. His 1970 article on species-specific defense reactions was another "Citation Classic." This work presented a blend of psychology and ethology that grew into an important trend that recognized biological constraints on, and the adaptive function of, learning and behavior.

His appreciation of the naturalness of fear-related behavior led Bolles to realize that animals need to learn more about their environments than about their behavior. This emphasis is represented in many articles from the 1970s and in his second textbook, *Learning Theory* (1975, 1978). As with the biological trend in animal learning, Bolles was a founder of the "movement" in animal cognition. For Bob, however, the biological and cognitive inputs to behavior reflected the same thing: that learning and behavior are organized according to functional systems adapted to solving natural problems. The integration of cognition and biology into the psychology of learning and motivation is beautifully illustrated in the second edition of *Theory of Motivation* (1975).

In the 1980s, Bolles's interests returned to problems of feeding and regulation. He focused on how the omnivorous rat learns about food and how this learning affects its flavor preferences. His interest in astronomy grew. He took several trips to Australia to study the Southern sky and had a book in manuscript form on the subject when he died. His passion for the history of psychology also reemerged. He became the first historian of the Psychonomic Society. And he published his third textbook, *The Story of Psychology: A Thematic History* (1993). Those who knew Bob can feel his voice in the language of that book. He had a remarkable capacity to speak to the reader in his writing.

Throughout his career, Bolles's writings were characterized by a deep perspective and a sly, irreverent sense of humor. Discussing the claim that there is only a quantitative difference in the temporal gaps that taste-aversion learning and other types of learning can bridge, he once noted that the ratio was roughly 1,000:1, about the same as the ratio between the length of the legs of a racehorse and the leg bumps found on the vertebrae of certain snakes. His unique contributions to psychology spanned five decades. He is survived by his wife, Yasuko Endo, and four children by an earlier marriage to Anne Lanning. He also leaves behind several generations of students and a legacy of ideas.

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