

*A MAJOR TRIO*

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For at least three decades, the Psychobiology Laboratory at Harvard Medical School was a major center of discovery in behavior analysis. In the three articles that follow, the principals of this laboratory, Peter Dews, William Morse, and Roger Kelleher, are each the subject of retrospective appreciations focusing on their contributions to behavior analysis. Collectively, these papers celebrate the unique discoveries of one of the most creative trios in the history of our field. Yet, to many of the current generation of behavior analysts, the names of Dews, Morse, and Kelleher may seem only vaguely familiar. Perhaps some would correctly associate these researchers with the early history of behavioral pharmacology, but their contributions to behavior analysis itself may not be so easily identified.

With the view that the history of our field is the field itself, I solicited these papers by Barrett, Branch, and Zeiler in an effort to bring into the present those backgrounds to fundamental discoveries of how contingencies work and their role in understanding concepts such as reinforcement, punishment, and discriminative control, as well as how contingencies can modulate—indeed, determine—how imposed consequent events affect behavior.

As Zeiler's title characterizes, the works of Dews, Morse, and Kelleher reflect a golden age of discovery of basic phenomena in behavior analysis. The patterns and successes in their work depended in part on the trio's extremely close and sensitive monitoring of ongoing behavior, uncanny intuition about how behavior–consequence relations might work, and an unbridled willingness to try novel procedures. The results of such talent, skill, and imaginative dedication are revealed in the papers to follow and include developments and findings in shaping, behavior dynamics, second-order schedules,

response-produced shock-maintained behavior, rate-dependency, and much more.

During its tenure, the Psychobiology Laboratory was a powerfully stimulating training site for many postdoctoral students, medical and graduate students, Research Fellows, and visiting scientists from around the world (e.g., Jonathan Katz, the current Behavioral Pharmacology Editor for *JEAB* is an alumnus). I had the privilege of being a Research Fellow there in the late 1960's, a particularly rich era of discovery. Dews was exploring the complex dynamics of fixed-interval schedules and Morse and Kelleher the conditions under which response-produced shock could maintain behavior. All three were testing the limits of the rate-dependency effects of drugs, one of the pillars of behavioral pharmacology. In collaboration with Al Herd in Physiology, an intense program of research was underway to determine the potential role of contingencies in the development and control of hypertension. A laboratory at the New England Primate Center also was being established, in part, to explore drug-maintained behavior in chimpanzees. Because visiting researchers in the lab had virtually complete freedom to explore their own interests, there were dozens of other projects ongoing. My office mate at the time, Jim McKearney, was then establishing himself as one of the most creative researchers in the history of behavioral pharmacology. Later he was to be a mentor to two of the contributors of this set of papers, Jim Barrett and Marc Branch.

In addition to the intellectual enrichment inherent in the lab itself, the Medical School and the Harvard-MIT environment provided more than anyone could even begin to absorb. Particularly memorable were lectures in the Physiology and Pharmacology courses in the Medical School presented by David Hubel, Torsten Wiesel, David Potter, and Ulrich Trendelenberg. Peter Dews accompanied his pharmacology lectures to the medical students by a very simple demonstration of stimulus

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control in the pigeon—the three-term contingency. He easily spoke for an hour on the implications of this demonstration, emphasizing the role of stimulus control both in the physician's efforts at diagnosis and the ability of patients to report their symptoms. Bill Morse had major responsibility for the pharmacology labs which included behavioral experiments as well as demonstrations. One compelling demonstration involved pigeons that had been trained on fixed-ratio schedules of food presentation. Bill would inject a dose of pentobarbital that essentially put the birds to sleep. Outside the operant chamber, he could place a pigeon on its back on a table where it would remain. Picked up and placed in the operant chamber, however, the pigeon would immediately begin key pecking at a very high rate, indeed, a rate higher than without the drug (see, e.g., Barrett, Figure 1). Thus, as he instructed, blanket drug descriptions such as “depressant” or “stimulant” may have little value in the face of variations in context and behavioral history.

One of the many highlights of life in the lab was the regular Friday afternoon “pigeon meetings” in Peter Dews' spacious office. Mike Zeiler from Wellesley and Mike Harrison from Boston University were frequent attendees, along with occasional other notables who happened to be in or passing through the Boston area. One of us might be asked to present the results of some current project (typically, there were lots of cumulative records unfolded for detailed inspection); the discussion was often lively and certainly always valuable and supportive.

But mentoring by each member of the trio was in no way confined to such relatively formal occasions; it was a daily treat. Bill Morse, in particular, took us under his wing in his often subtle and cryptic manner. He had a powerful economy of expression and sometimes you were unsure if he had made a statement or posed a question for you to consider—either way, you knew it must be significant. As Zeiler's paper emphasizes, Bill had a special genius with shaping. I often watched him “play” with behavior as he stood in front of a relay rack (a programming apparatus of old) changing some parameter while watching the cumulative record, or shaping the performance of a squirrel monkey with adroitly delivered shocks. This brought to

me a kind of epiphany regarding the beauty of behavior analysis and control as revealed by a master. In addition, as Associate Editor of *JEAB* at the time, Bill was also instrumental in teaching us the skills of reviewing experimental papers. In congruity with his skill in shaping, one of the lessons he taught was to give special encouragement to a young researcher, in part through being less critical of certain flaws. In contrast, he emphasized that we should be particularly careful when reviewing experienced researchers—don't let them get away with anything.

Roger Kelleher was the perfect foil for Bill, and the two of them had a kind of intellectual resonance that resulted in some of the most important discoveries ever made in behavior analysis. I recall Roger walking into the lab in the mornings and immediately saying to Bill, “I had some good ideas last night; let's talk about them,” and off they would go to Bill's office. One reason I had gone to this lab was my interest in second-order schedules and Roger was the pioneer in this area. Discussions with him were immensely valuable and he had a gentle, affable, and humorous manner coupled with an enormous breadth of knowledge and a penetrating intelligence. He was very free with ideas and readily encouraged our own. Even after all this time, some of his insights live on in my memory. Sadly, in the late 1970's Roger developed a brain tumor that brought his brilliant career to a close. I have always felt that Roger's work has not received the recognition it truly merits. Marc Branch's paper is, I think, a partial redress of that lamentable condition.

Peter Dews was an utterly commanding presence, assuming immediate intellectual control of all around him. This had nothing to do with aggressiveness or arrogance; he was very friendly and engaging. Rather, such control emerged from one of the most formidable intellects in my experience. He appeared to grasp the most complex of situations instantly, reducing them to the simplest possible terms and making spot-on judgments. His work has a special beauty and elegant simplicity about it—like a fine classical Japanese print with nothing out of place and not a single superfluous line. He tended to work alone and say little about any of his experiments until they were finished, then reveal often startling results.

To most in the field, Peter would be considered the father of behavioral pharmacology, and, as Barrett's paper shows, the line between pharmacology and behavior for him was blurred. He understood the deep symmetry between the role of behavior in understanding the action of drugs and the actions of drugs in revealing properties of behavior. In

exploring this principle, he taught us much about both drugs and behavior.

I want to express my special thanks to the authors of the following papers. In giving us a vivid portrait of the extraordinary contributions of Dews, Morse, and Kelleher, they have performed an invaluable service to the history of behavior analysis.