

Operant Psychology Goes to the Fair: Marian and Keller Breland in the Popular Press, 1947–1966

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Marian and Keller Breland pioneered the application of operant psychology to commercial animal training during the 1940s and 1950s. The Brelands' story is relatively unknown in the history of behavior analysis. Using information from the Breland–Bailey papers, this paper describes the development and activities of Animal Behavior Enterprises (ABE), the Brelands' animal training business. We also review popular press coverage of the Brelands between 1947 and 1966 to investigate the level of public exposure to ABE-trained animals and to the principles and methods of operant psychology. An examination of 308 popular print articles featuring the Brelands indicates that there was public exposure of behavior analysis through the popular press coverage of ABE-trained animals. Furthermore, the expansion of operant methods to the marine mammal and bird training industries can be linked to the Brelands' mass media exposure.

Key words: Marian Breland Bailey, Keller Breland, history, operant psychology, commercial animal training

A special section of *The Behavior Analyst* (History and Behavior Analysis, 2003, pp. 233–295) focused on the expansion of operant psychology in the 1950s. The expansion was attributed to behavior analysis enhancing the understanding and prediction of behavior and producing successful applications (Dewsbury, 2003). The special section included articles describing such applications. One article (Morris, 2003) traced the beginning of the application of behavior analysis to animal training to the work of Marian and Keller Breland (K. Breland & Breland, 1951) and to Skinner (1951). Morris further noted that the history of operant psychology

in commercial animal training from 1951 to the 1990s was “history yet to be told” (p. 283). Our purpose is to tell a part of that history; specifically, the Brelands' successful application of behavior analysis to train animals for commercial and entertainment purposes during the mid 20th century. We provide evidence of the Brelands' animal training activities and examine contemporary popular press accounts of their pioneering work.

The story of the Brelands and their commercial application of behavioral technology, Animal Behavior Enterprises (ABE), is unlike other stories of the expansion of operant psychology into applied settings in the 1950s. The Brelands did not complete their doctorates or take academic positions before pursuing a commercial enterprise¹; they did not enter an established in-

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¹ Marian received her undergraduate degree (summa cum laude) from the University of Minnesota in 1941 in psychology, with minors in languages and statistics. She completed her PhD in experimental psychology at the University of Arkansas, 38 years after she began study under B. F. Skinner. Marian taught at Henderson State

dustry, like pharmaceuticals or psychiatry; they did not leave a long peer-reviewed publication record. In addition, the Brelands began to apply operant technology commercially in the early 1940s, predating later operant animal trainers and behavior analysts. These differences make placing the Brelands in the context of the history of operant psychology difficult and may partially explain the relative lack of attention given the Brelands in academic accounts of the history of operant psychology. We thus begin with a brief account of the Brelands' path from promising doctoral students to entrepreneurial animal trainers and review their relations with academic psychology.

The Brelands and ABE

The Brelands' story begins at the University of Minnesota, where they were students of B. F. Skinner (Marian as early as 1938, Keller in 1940). Later, from 1942 through 1943 they worked with Skinner on Project Pigeon (see Skinner, 1960). Marian recounted that their experiences controlling animal behavior convinced the Brelands of the commercial potential of operant conditioning for animal training (M. B. Bailey & Bailey, 1994b). In 1943, the Brelands purchased a small farm in Mound, Minnesota, and, in their barn laboratory, began replicating Skinner's experiments from *The Behavior of Organisms* (1938). Although Skinner had primarily studied rats, the Brelands studied operant principles with a variety of animals including dogs, cats, chickens, parakeets, turkeys, pigs, ducks, and hamsters. Impressed with their results, Marian and Keller decided not to complete their degrees, but rather pursued the commercial training of animals for advertising and entertainment. As Marian explained it, "we

wanted to try to make our living using Skinner's principles of the control of behavior" (personal communication, 1994). The Brelands chose the name "Animal Behavior Enterprises" because it described the product, animal behavior, and proclaimed that it was a for-profit business (K. Breland & Breland, 1946).

Putting bread on the table in the 1940s using a new behavioral technology was not easy. Although operant principles were known by some in the academic community (Skinner, 1938), operant training methods were virtually unheard of in entertainment and advertising. ABE's success depended on the Brelands' selling their nascent technology to businesses that knew nothing of the science of behavior. The high risks of such a venture were recognized by many of the Brelands' colleagues who doubted ABE would succeed (M. B. Bailey & Bailey, 1994b). A University of Minnesota classmate, Paul Meehl, bet the Brelands \$10 that ABE would fail. Meehl's check to Keller (Meehl, 1961) in payment for the wager hangs on the wall in the Baileys' office (see Figure 1). Skinner also attempted to dissuade the couple from abandoning academia for their untested commercial enterprise (M. B. Bailey & Bailey, 1994b). Despite these cautions, the Brelands persevered and received their first contract in 1947 with General Mills (Barnes, 1947) to train animals for farm feed promotions (see Figure 2). Over the next 2 years, the business outgrew the Brelands' training farm. The Brelands moved ABE from Minnesota to Hot Springs, Arkansas, in 1950 for larger quarters, a warmer climate, and more central rail connections (Gillaspy & Bihm, 2002). Additional contracts with General Mills and other companies for more and different animal behaviors led to Breland shows playing at hundreds of feed stores, trade shows, fairs, and expositions nationwide. In 1955, the Brelands opened the IQ Zoo in Hot Springs, which served as a training laboratory and a popular tourist attraction (Coffman,

University (1981–1998), where she retired as a full professor. Keller received his undergraduate degree in psychology at Milsaps College in 1937 and a Master's degree in psychology from Louisiana State University in 1939.

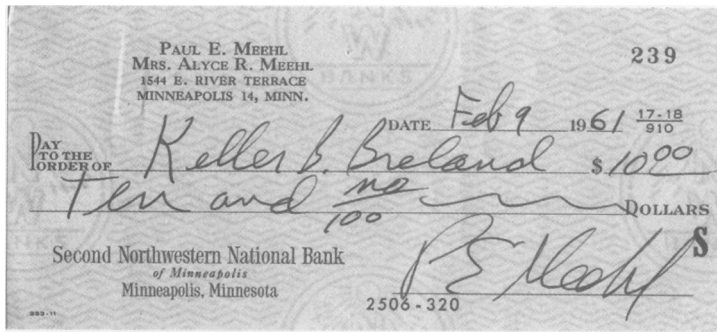


Figure 1. Check from Paul Meehl to Keller Breland in payment of a wager made in 1944 that ABE would not succeed.

2002). Figure 3 features the Brelands with one of their popular IQ Zoo acts. Although Keller Breland died in 1965, ABE continued to flourish and became international in scope. Marian Breland

(Marian Breland Bailey in 1976) and second husband, Bob Bailey, operated the business until 1990 when ABE closed. Throughout 47 years of operation, ABE trained over 15,000 animals



Figure 2. Front-page article from *The Minneapolis Star*, August 4, 1948. Quoting the reporter, Frank Murray, “But the whole method of training is just a question of getting down to the pig’s basic behavior pattern and altering the pig’s responses to each stimulus to suit the goal you seek.”



Figure 3. IQ Zoo's Professor Punch on the piano with Keller and Marian Breland (late 1950s).

representing more than 140 species for entertainment, corporations, and government agencies and consulted with numerous zoos, oceanaria, and amusement parks (M. B. Bailey & Bailey, 1994a; Gillaspy & Bihm, 2002).

The Brelands and Commercial Animal Training

We could find no evidence of animal trainers intentionally using operant conditioning in commerce prior to the Brelands. Although based on Skinner's operant principles, the Brelands' training methods were refined and adapted for use in the field by relatively unskilled personnel working with a variety of species. Perhaps their most notable refinement was the prominent and precise use of a secondary reinforcer (whistle or click) as a stimulus for, or a time bridge leading to, the upcoming delivery of a primary reinforcer (food). In the mid 1940s, the Brelands coined

the term *bridging stimulus*² to refer to this reinforcer. The bridging stimulus enabled ABE trainers to control behavior in settings in which immediate access to a primary reinforcer was impractical.

The Brelands' refined methods led directly to their pioneering application of operant conditioning in the commercial animal training industry and to the dissemination of these highly effective methods. They taught operant conditioning to local field and obedience dog training organizations as early as 1944 (M. B. Bailey, 1996). The Brelands also conducted formal animal training classes, including the fundamentals of operant conditioning, stage-animal handling, and theatrical "showmanship," to General Mills animal

² The term *bridging stimulus* was later shortened to a more cryptic *bridge*, and additionally referred to the process of providing the signal and the device for producing the signal.

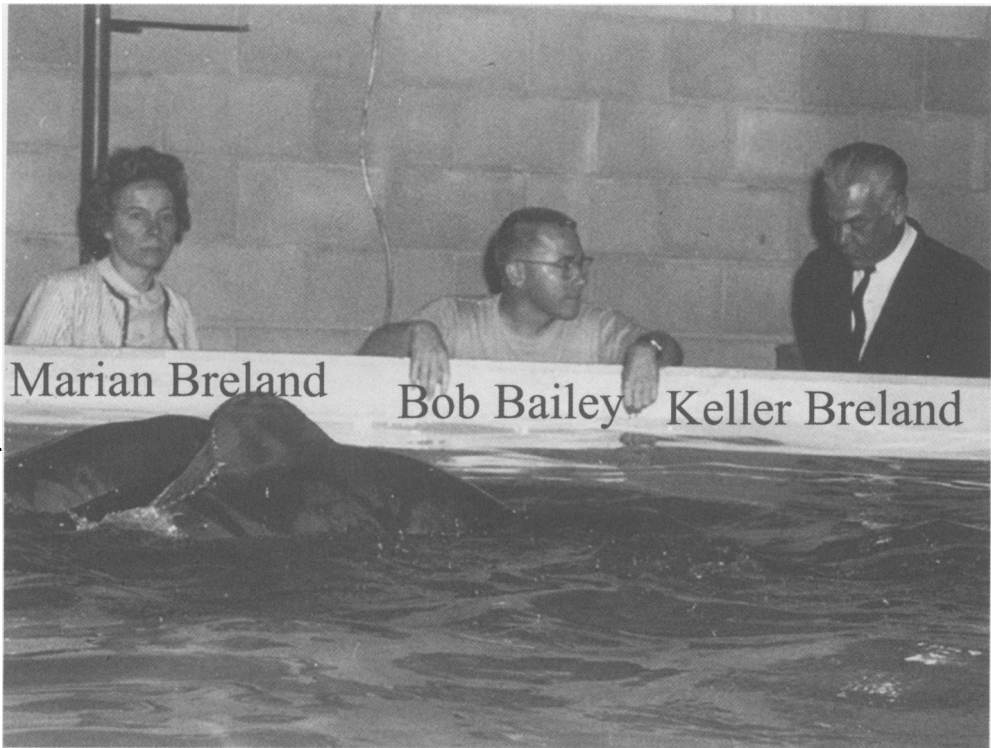


Figure 4. Marian and Keller Breland and Bob Bailey at Animal Behavior Enterprises in Hot Springs, Arkansas, with two newly arrived U.S. Navy dolphins (October 1963).

feed salesmen (M. B. Bailey, 1996). Classes included the use of written manuals that provided detailed training instructions for each Breland animal act (K. Breland & Breland, 1947). These manuals were perhaps the first operant manuals for training many species in many settings and for use by the general public (sales staff, animal trainers, etc.). After such instruction, salesmen traveled nationwide shaping and maintaining animal behavior and presenting animal shows.

ABE operant methods spread to marine mammal and bird training in the 1950s and 1960s. The Brelands contracted with Marine Studios (Marine Studios, 1955, 1956), Marineland of the Pacific (Marineland of the Pacific, 1956), Parrot Jungle (Parrot Jungle, 1957), and the U.S. Navy (U.S. Naval Ordnance Test Station, 1962, 1963a, 1963b, 1963c, 1964) to develop training programs and animal shows. The first author has firsthand knowledge of

the Brelands' contribution to the U.S. Navy's Marine Mammal Program (see Figure 4). He was the Navy's Director of Training from 1962 until 1965. The first author credits much of his success as a trainer, and as a practitioner of behavior analysis, to Marian and Keller Breland. In 1955, the Brelands wrote perhaps the first manual for training dolphins using operant methods (K. Breland, 1955, 1962). The marine mammal training program at Sea World, the world's largest, can be traced back to the Brelands through Kent Burgess, Sea World's first Director of Training, who was trained by Marian and Keller at ABE from 1953 to 1964. In addition, the marine mammal training methods developed at ABE in the 1950s spread to modern day-dog training. As Pryor (1997) noted,

What the dog trainers are calling clicker training is an application of behavior analysis that was initially invented and developed more than thirty

years ago, by Keller Breland, Marian Breland Bailey and Bob Bailey. It first reached widespread use in the training of marine mammals, which is where I learned it myself. Although the marine mammal trainers use a whistle, not a clicker, their training relied on the same principles and is really exactly the same as what people are now calling clicker training. (p. 1)

The Brelands and Academic Psychology

Throughout their careers, the Brelands maintained ties with academic psychologists and behavior analysts. Keller and Marian were members of the American Psychological Association (APA) before 1946 and the Minnesota Society for Applied Psychology as early as 1946. They consistently attended and presented at regional and national professional meetings, including APA. Although most of their time was devoted to commerce, during the 1950s and 1960s the Brelands managed to publish two peer-reviewed journal articles, "A Field of Applied Animal Psychology" (K. Breland & Breland, 1951) and "The Misbehavior of Organisms" (K. Breland & Breland, 1961); a textbook, *Animal Behavior* (K. Breland & Breland, 1966), part of Macmillan's Critical Issues in Psychology Series; and contributed significantly to one of the first institutional personnel instructional manuals, *Teaching the Mentally Retarded* (M. Breland, 1965). Marian attributed their lack of scholarly publication to simple reinforcement; the behavior reinforced was producing successful shows, not publishing research articles (M. B. Bailey, 1996). In the 1950s, few, if any, of the Brelands' clients read scientific journals, nor were they impressed with academic or professional credentials. That the Brelands wrote for scholarly audiences at all was due to a desire for intellectual discourse and stimulation, and, as Keller said, "for the fun of it" (Keller Breland, personal communication, 1962).

The Brelands' scholarly work sometimes evoked controversy within academic psychology. Although there are few published contemporary accounts

of the Brelands' activities in academic psychological circles in the 1950s, Gollub (2002) provides a telling retrospective of a presentation given by the Brelands to the Pigeon Lab at Harvard University:

I recall that [the Brelands] were given a particularly serious grilling and were bombarded with alternative explanations, and everyone seemed unconvinced of the importance of their findings. A decade or two later, research on reinforcers as eliciting stimuli, and the species-related relations between discriminative stimuli and responses, should not have been, but were, surprising and puzzling to some members of the behavior analysis community. (p. 324)

Of the three published reports of their animal training activities, "The Misbehavior of Organisms" (1961) was probably most controversial and influential. The Social Science Citation Index lists 228 citations for "Misbehavior" compared to 72 for *Animal Behavior* (1966) and 13 for "A Field of Applied Animal Psychology" (1951). The debate inspired within mainstream behavior analysis by "Misbehavior" concerning the role of instinctive behavior has been summarized previously (M. B. Bailey & Bailey, 1993; R. E. Bailey & Bailey, 1980; Herrnstein, 1977; Skinner, 1977; Todd & Morris, 1992). With the exception of "Misbehavior," however, the Brelands' other scholarly works, especially "A Field of Applied Animal Psychology," have received little attention from academic psychology. In that article, the Brelands described the initial success of ABE and their vision for expanding operant theory and techniques into animal training. They did not, however, publish any follow-up articles and, with the exception of Gillaspay and Bihm (2002), Marr (2002), and Timberlake (2003), there have been few scholarly accounts of the Brelands' contributions to operant psychology.

The Brelands in the Popular Press

The applied and commercial nature of the Brelands' work and careers makes it difficult to investigate their contributions through traditional meth-

ods (peer-reviewed articles and citations of scholarly work). Thus, we examined reports of the Brelands' work at ABE in the popular press. The study of popular media coverage of psychology is recognized as an important way to understand psychology's contribution to American life (Benjamin, 1986). Psychology as a discipline cannot be understood outside "the culture in which it is produced and received" (Rutherford, 2000, p. 373).

This last statement seems particularly applicable to the Brelands, who spent their careers in the very public world of animal shows, advertising, and entertainment. For example, during the 1950s and 1960s the Brelands and their operant trained animals made numerous appearances on television programs (e.g., "Ed Sullivan," "Dave Garroway," "Jack Paar," "Steve Allen," "Zoo Parade," "You Asked For It," "The Tonight Show with Johnny Carson," and "Industry on Parade"), advertisements ("Puss N' Boots," "Coast Federal Savings and Loan"), and educational films (*Frances and Her Rabbit*, Animal Behavior Enterprises, 1961; *Lucky Learns a Trick*, Animal Behavior Enterprises, 1954).

In this paper, however, we focus only on coverage of the Brelands' commercial application of behavior analysis in the popular print media from 1947 (the year of ABE's first contract) through 1966 (the year after Keller's death). We investigated two issues regarding the popular press coverage of the Brelands: (a) the level of exposure of ABE's product, operant-trained behavior, and (b) the degree to which behavior-analytic terminology was used in popular reports. Stated in a slightly different way, we wanted to assess how much public exposure the Brelands' work received between 1947 and 1966 and how much the Brelands' work exposed the public to the terminology, principles, and practices of behavior analysis. *Public exposure of Breland-trained animals* was defined as the number of articles featuring the Brelands and the scope of distribution

of the media (local, state, regional, national, or international). *Public exposure of the terminology* was operationalized as the use of specific terminology relevant to the practice of operant psychology (e.g., conditioning, reinforcement, behavior, psychology, science, etc.).

METHOD

Data (The Breland–Bailey Papers)

We gathered data from the Breland–Bailey papers, a collection of personal papers, business documents, and other materials of Keller Breland, Marian Breland Bailey, and Bob Bailey.³ This collection is a previously unopened window to the past of the Brelands' commercial activities and includes letters, contracts, proposals, equipment designs, and training manuals, protocols, and plans. The popular print media described in this collection include articles from newspapers, magazines, and trade publications. These articles provided a unique opportunity to study popular press coverage of the Brelands.

Popular print media before the 1970s are extremely difficult to locate because databases contain indexes for only a few periodicals and newspapers. We found this especially true when searching for articles on ABE. A search of the *Reader's Guide to Periodical Literature* between 1947 and 1966 resulted in fewer than 20 articles on the Brelands or their animal shows. Common newspaper search engines also contained few citations of stories about the Brelands. Yet, as will be shown, from 1947 through 1966 there were hundreds of media accounts of ABE, the Brelands, and their trained animals.

The articles in the Breland–Bailey collection were accumulated essentially in real time, by relatives, friends,

³ The Breland–Bailey papers are currently located at the University of Central Arkansas in preparation for permanent housing at the Archives of the History of American Psychology at the University of Akron.

TABLE 1

Distribution of print media sources publishing articles about ABE from 1947 through 1966

	1947-1949 <i>n</i> (%)	1950-1954 <i>n</i> (%)	1955-1959 <i>n</i> (%)	1960-1966 <i>n</i> (%)	Total <i>N</i> (%)
Publication type					
Magazines	4 (20)	16 (23)	21 (23)	41 (27)	82 (27)
Newspapers	12 (60)	37 (53)	31 (47)	94 (62)	174 (57)
Trade publications	3 (15)	7 (10)	8 (12)	8 (5)	26 (8)
Other publications	1 (5)	10 (14)	6 (9)	9 (6)	26 (8)
Total	20 (7)	70 (23)	66 (21)	152 (49)	308 (100)
Distribution					
Local	6 (30)	21 (30)	21 (32)	51 (33)	99 (32)
Statewide	7 (35)	28 (40)	19 (29)	48 (32)	102 (33)
National	7 (35)	17 (24)	21 (32)	45 (29)	90 (29)
International	0 (0)	4 (6)	5 (7)	8 (6)	17 (6)
Total	20 (7)	70 (23)	66 (21)	152 (49)	308 (100)

and colleagues who sent copies to the Brelands. ABE also employed a clipping service from 1964 to 1966 that searched newspapers nationwide. Thus, this collection contains many articles about the Brelands that are not readily available through traditional search methods or at least without a direct search of the index for each newspaper and magazine published in the nation.

Data and Procedure

We identified 689 newspaper, magazine, trade journal, and similar print media articles that directly featured the Brelands' practices of applied behavior analysis between 1947 and 1966. The publication name or date was missing or otherwise not verifiable for over half of these articles ($n = 381$). These unverifiable articles were excluded from in-depth study. The final sample included 308 articles for which complete information was available. For convenience in analysis and presentation, we subdivided the data into four chronological sections: 1947 through 1949; 1950 through 1954; 1955 through 1959; and 1960 through 1966.

Each article was read, and the following data were coded: type of publication (newspaper, magazine, etc.),

name of publication, distribution of publication (local, state, national, international), date, location, article title, author (if specified), volume and page numbers, and if a photo was used. In addition, we coded the use of 20 key words related to the principles, practices, methods, and vocabulary of behavior analysis (e.g., *operant*, *conditioning*, *stimulus*, *reinforcement*, etc.) and six key words associated with the Brelands (*IQ Zoo*, *Animal Behavior Enterprises*, *Marian and Keller Breland*, etc.). Coding indicated whether a key word appeared, but not the number of times it was used; the word needed to appear only once in an article to be counted (it was expedient for data collection to ignore recurrences). Several individuals read and coded data. Entries were cross checked, and an independent coder resolved discrepancies between coders. Coding errors were not common and usually involved key words, publication dates, or interpretations of print media mastheads (e.g., address of publication).

RESULTS

Popular Press Coverage of ABE-Trained Animals

Table 1 presents frequencies and percentages of popular print articles by

publication type and distribution type. An examination of totals across the four time periods revealed a sizable increase in the exposure of the work of ABE to the general public between 1947 ($n = 20$) and 1966 ($n = 152$), with some leveling off during the 1950s. In terms of type of publication, most articles appeared in newspapers (57%), followed by magazines (27%), and then by trade publications and other (advertisements). This pattern of publication type remained fairly consistent for all four time periods. The scope of distribution of the publications in which ABE articles appeared was approximately equal across local (32%), state (33%), and national (29%) outlets. Articles about ABE in international publications accounted for 6% of the sample. Article distribution type was also consistent across the time periods, except 1947 to 1949.

Table 2 presents a list of periodicals featuring the Brelands and ABE. Periodicals ranged from small-town newspapers, such as the *Fitchburg, Massachusetts Sentinel* ("Farmers News," 1948) and the *Renville Star-Farmer* ("Casey the Hen," 1954), to city newspapers, such as the *Minneapolis Star* (Murray, 1948), the *Fort Worth Star Telegram* (Dolan, 1955), and the *Kansas City Star* (Phillips, 1955), to major national newspapers, such as the *Wall Street Journal* ("Summer Selling," 1954), the *New York Times* ("Keller Breland," 1965), the *Los Angeles Times* ("Porpoise Psychoanalyzed," 1956), and magazines, such as *Life* ("Farmyard Students," 1955; "Fur and Feathers," 1953; "This Whale," 1957), *Time* ("IQ Zoo," 1955), *Better Homes and Gardens* (M. Breland & Breland, 1960a, 1960b, 1960c), *Popular Mechanics* (Hicks, 1953a, 1953b), *Humane Society Review* (K. Breland & Breland, 1953; Hicks, 1954), and *Reader's Digest* (Wolfert, 1957).

The Brelands were also well represented in nationally distributed industry trade journals from the following areas: advertising, *Advertising Age*

(Phillips, 1954), *Billboard* ("Ain't Nobody Here," 1966), *Concessions and Vending* ("Would you Believe," 1966) and *Broadcasting* (Perkins, 1960); farming, *Rabbit Raiser* ("Trained Rabbits," 1958) and *Farm Journal* (Breland & Breland, 1958). They also appeared frequently in children's publications such as *Grit* (Mathis, 1962), *My Weekly Reader* ("Animal School," 1956; "Animals do Tricks," 1962; Niciejewski, 1951), and *Boy's Life* (Spain, 1956). Breland animals were featured in award-winning photographs in the 25th year "Best of" issue of *Life*, ("That's all Folks," 1960), *Parade* ("Four-Way Stretch," 1953), and *Collier's* (Patterson, 1952). Finally, articles on the Brelands appeared in numerous pet publications. They wrote over 20 articles in these sources, mostly on dog training, thus providing exposure of operant methods to the dog training community.

Use of Operant Psychology Terminology

To investigate the depth of exposure of behavioral terminology, principles, and methods, we counted those articles in which selected key scientific and operant terminology was used. Table 3 summarizes the frequencies and percentages of articles that contained each key word. The Brelands' training methods were often associated with psychological science and with behaviorism in the present sample of popular press articles. *Psychology* or *psychological* was found in 59% of articles, and *science* appeared in 27%. The Brelands were often referred to as psychologists, and their approach was described as animal psychology. The Brelands' success was also specifically associated with behavioral psychology, with *behavioral* or *behaviorism* appearing in 37% of articles.

Specific operant principles were used throughout the articles. Two of the most common behavioral terms were *reinforcement* (-ing) (19%) and *conditioned* (-ing) (19%). Animal be-

TABLE 2

Unique print media sources containing Brelands or ABE animals from 1947 through 1966

Newspapers		
<i>Arkansas Democrat</i>	<i>Long Beach Press Telegram</i>	<i>Texarkana Daily News</i>
<i>Arkansas Democrat, Sunday Magazine</i>	<i>Los Angeles Times</i>	<i>Texarkana Gazette</i>
<i>Arkansas Gazette</i>	<i>Mason City Globe Gazette</i>	<i>The American Weekly</i>
<i>Arkansas Gazette Sunday Magazine</i>	<i>Memphis Press-Scimitar</i>	<i>The Beacon</i>
<i>Atlanta Journal and Constitution Magazine</i>	<i>Milwaukee Journal Green Sheet</i>	<i>The Camden News</i>
<i>Atlantic City Press Billed Bladet</i>	<i>Minneapolis Star</i>	<i>The Chattanooga Times</i>
<i>Buffalo Courier-Express Cavalcade</i>	<i>Minneapolis Sunday Tribune</i>	<i>The Cincinnati Pictorial Enquirer</i>
<i>Chicago Daily News</i>	<i>Minneapolis Tribune</i>	<i>The Columbia Missourian</i>
<i>Chicago Tribune</i>	<i>Mirror-News</i>	<i>The Daily Banner News</i>
<i>Columbus Dispatch</i>	<i>Montreal Gazette</i>	<i>The Dallas Morning News</i>
<i>Daily Journal</i>	<i>My Weekly Reader</i>	<i>The Dallas Times Herald</i>
<i>Daily Mirror</i>	<i>National Enquirer</i>	<i>The Indianapolis Star</i>
<i>Daily News</i>	<i>New York Post</i>	<i>The Kansas City Star</i>
<i>Detroit News Pictorial Magazine</i>	<i>New York Times</i>	<i>The LaCrosse Tribune</i>
<i>Fitchburg (Mass) Sentinel</i>	<i>New York World Telegram and Sun</i>	<i>The Los Angeles Times</i>
<i>Fort Worth Star Telegram</i>	<i>Oklahoman</i>	<i>The Miami Herald</i>
<i>Globe-Democrat</i>	<i>Parade</i>	<i>The Milwaukee Journal</i>
<i>Grit</i>	<i>Philadelphia Inquirer Magazine</i>	<i>The Mirror</i>
<i>Herald Tribune</i>	<i>Renville Star-Farmer</i>	<i>The Montreal Star</i>
<i>Hot Springs News</i>	<i>Rochester Post Bulletin</i>	<i>The Post & Times Star</i>
<i>Hot Springs Sentinel Record</i>	<i>San Antonio Express</i>	<i>The Princeton Union</i>
<i>Hot Springs Shopper</i>	<i>San Antonio Light</i>	<i>The Sioux City Sunday Journal</i>
<i>Houston Chronicle Rotographe Magazine</i>	<i>San Antonio News</i>	<i>The Star</i>
<i>Kansas City Times</i>	<i>Springfield Mass Union</i>	<i>The State Journal</i>
<i>Knoxville News-Sentinel</i>	<i>Springfield News & Leader</i>	<i>The Sunday Press</i>
<i>La Presse</i>	<i>St. Louis Post-Dispatch</i>	<i>The Vicksburg Evening Post</i>
<i>Lansing State Journal</i>	<i>St. Paul Sunday Pioneer Press</i>	<i>The Weekly Reader: World Parade Times</i>
	<i>Stars and Stripes</i>	<i>Topeka Daily Capitol</i>
	<i>Sunday News</i>	<i>Waco Tribune-Herald</i>
	<i>Sunday Times Democrat</i>	<i>Wall Street Journal</i>
	<i>Syracuse-Herald American</i>	
Popular magazines		
<i>Adventures Along the Ozark Frontier Trail</i>	<i>Kristall</i>	<i>Pour Tous (Swiss)</i>
<i>All Pets</i>	<i>Life Magazine</i>	<i>Rabbit Raiser</i>
<i>Arkansas Youth Council</i>	<i>Look Family Magazine</i>	<i>Reader's Digest</i>
<i>Beacon</i>	<i>Mechanix Illustrated</i>	<i>Redbook</i>
<i>Better Homes and Garden</i>	<i>Montreal Mantin</i>	<i>Sinclair Oil News</i>
<i>Billboard</i>	<i>National Humane Review</i>	<i>Sports Illustrated</i>
<i>Boys' Life</i>	<i>National Retired Teachers Association Journal</i>	<i>The American Magazine</i>
<i>Catholic Digest</i>	<i>New York Magazine</i>	<i>The Saturday Evening Post</i>
<i>Coast Federal Challenger</i>	<i>Outdoor</i>	<i>The Westerner</i>
<i>Collier's</i>	<i>Parks and Recreation</i>	<i>This Week in Los Angeles</i>
<i>Country Gentleman</i>	<i>People Today</i>	<i>Tide</i>
<i>Dodge News</i>	<i>Pet Life</i>	<i>Time</i>
<i>Ford Times</i>	<i>Pioneer Magazine</i>	<i>Today in Hot Springs</i>
<i>Hearth</i>	<i>Popular Mechanics</i>	<i>Town Journal</i>
<i>Holiday Inn Magazine</i>	<i>Popular Science</i>	<i>Trade Winds</i>
		<i>TRUE</i>

TABLE 2

Continued

Trade magazines		
<i>Advertising Age</i>	<i>Dr. Salsbury's Lab & Field</i>	<i>Larro Flyer</i>
<i>Allied Veterinarian</i>	<i>Notes</i>	<i>Modern Millwheel</i>
<i>Amusement Business</i>	<i>Farm Journal</i>	<i>Packomatic</i>
<i>Animal Protection</i>	<i>Feedstuffs</i>	<i>Performing Animals</i>
<i>Broadcasting</i>	<i>John Francis Daugherty Associates</i>	<i>Petfood Industry</i>
<i>Concessions and Vending</i>	<i>King Features Bulletin</i>	<i>Successful Farming</i>
<i>Cyanograms</i>		

havior was usually referred to as the product of conditioning or due to the provision of positive reinforcement. In addition, 25% of articles also emphasized that punishment was neither necessary nor desirable in animal training.

As mentioned, these operant training concepts were relatively unknown in the animal training community of the times; thus, their occurrence in the popular print was somewhat unexpected.

TABLE 3

Distribution of key-word use in print media from 1947 to 1966

Key word	1947-1949		1950-1954		1955-1959		1960-1966		Total	
	n	%	n	%	n	%	n	%	n	%
Animal Behavior Enterprises	3	15	14	20	16	24	86	57	119	39
Behavioral (-ism)	8	40	27	39	22	33	56	37	113	37
Keller Breland	15	75	63	90	49	74	95	63	222	72
Marian Breland	5	25	29	41	39	59	72	47	145	47
Bridge (-ing)	1	5	2	3	4	6	3	2	10	3
Condition (-ed) (-ing)	1	5	14	20	14	21	30	20	59	19
Discriminate (-tion) (-ing)	0	0	3	4	8	12	8	5	19	6
Educate (-tion)	2	10	25	36	17	26	28	18	72	23
Extinguish (extinction)	0	0	1	1	6	9	2	1	9	3
Generalize (-ation)	0	0	2	3	3	5	3	2	8	3
Hot Springs, Arkansas	2	10	49	70	44	67	86	57	181	59
Instinctive (-ual)	0	0	4	6	6	9	7	5	17	6
IQ Zoo	0	0	13	19	31	47	70	46	120	39
Operant	1	5	4	6	2	3	2	1	9	3
Pavlov	0	0	2	3	2	3	7	5	11	4
Psychology (-ical)	14	70	56	80	41	62	72	47	183	59
Nonuse of punishment	6	30	23	33	19	29	30	20	78	25
Reinforcement (-ing)	1	5	19	27	20	30	17	11	57	19
Research	1	5	11	16	6	9	36	24	54	18
Response	4	20	7	10	11	17	23	15	45	15
Science	1	5	22	31	23	35	38	25	84	27
Shape (-ing)	0	0	2	3	2	3	2	1	6	2
Skinner	0	0	4	6	4	6	6	4	16	5
Species	0	0	6	9	11	17	32	21	49	16
Stimulus (-li)	3	15	11	16	13	20	19	13	46	15
Technology	0	0	1	1	1	2	1	1	3	1
Other	0	0	5	7	12	18	17	11	34	11

The incidences of other specific operant language were more mixed. *Response* occurred in only 15% of the stories. We often found *trick*, *move*, or other lay terms used in place of *response*. The occurrence of *stimulus* (-li) was also 15%, ranging from 13% to 20%. In many articles, *cue* or *signal* was found instead. These terms were often used by Keller to communicate the concept. Other more technical terms, such as *discrimination* (6%), *extinction* (3%), and *generalization* (3%), did not appear frequently. Interestingly, *bridging stimulus* or *bridge*, which is a familiar term today especially in marine mammal training and clicker training circles, was found in up to 6% of articles and was first found as early as 1947. The Brelands had just coined this term in the late 1940s. The Brelands' success in spreading the language of operant psychology is tempered by the finding that *operant* appeared in fewer than 7% of articles. Also, there were few incidences of *operant* and *conditioning* appearing together.

The concept of using behavioral methods to *educate* animals appeared with some frequency (23%). ABE publicity often described their animals as *educated* or having gone to school. This is consistent with the incidence of *IQ Zoo* (39%), the tourist attraction that featured *educated* animals. From this perspective, operant training was presented as a process of *education* and emphasized that punishment was not used. Articles containing *education* also typically included a brief explanation of how *reinforcers* were used to produce and maintain highly specific animal behavior.

As expected, the name *Animal Behavior Enterprises* appeared with some frequency (15% in the late 1940s to 57% by the mid 1960s). This is interesting because the sales and marketing arm of ABE was named Keller Breland Associates (KBA). KBA often appeared in advertisements for Breland-trained animals. Keller Breland preferred *Animal Behavior Enterprises* be-

cause he believed the animal behavior was easily remembered (personal communication, November 1962). The present data seem to support Keller's viewpoint. Also a high number of articles contain *Keller Breland* (72%) and *Marian Breland* (47%). This finding reflected the Brelands' differing roles at ABE and Keller's respect for Marian's intellectual and training contributions. Marian seldom traveled, but rather focused on training and business operations, while Keller traveled widely and performed shows and gave interviews. Thus, although Marian was seldom present during interviews, she was mentioned frequently. The first author has personal knowledge of Keller describing Marian as an equal partner at ABE.

DISCUSSION

The findings of this investigation provide contemporary evidence of the Brelands' application of operant psychology to commercial animal training during the mid 20th century and support the idea that their activities exposed the public to operant conditioning. An examination of the Breland-Bailey papers yielded over 600 popular press accounts of the Brelands' work from 1947 to 1966; 308 of these articles contained source and date information. Although most of the popular coverage of ABE was in local, state-wide, and national published media, there was also some international circulation. The distribution of the articles indicates that there was widespread coverage of the Brelands' work in the popular print media during the middle of the century. Widespread coverage in local, state, and national publications translates, we suggest, to a large section of the general public being exposed to the application of behavior analysis to animal training.

The use of psychological and behavioral terms in the articles also indicates that popular press coverage of ABE was exposing operant principles to the public and by inference to the animal

training community. Although it was often the antics of dancing chickens, drumming and piano-playing ducks, roller-skating macaws, and reindeer operating a printing press that captured headlines, technical explanation of the behaviors and the methods used to produce the behavior were also frequently provided. The content of the articles varied from a reporter's brief description of Breland-trained animals at a local fair, to more in-depth expositions of the principles of applied behavior analysis, to how-to explanations of dog training, and to advocacy-oriented essays on the benefits of humane training methods. In the majority of these articles the Brelands' work was consistently associated with behavioral psychology.

Some of the overall percentages of specific operant key words may not seem particularly high (*discrimination* = 3% to *nonuse of punishment* = 25%). Several factors should be considered when interpreting these percentages, however. First, operant psychology itself was in its infancy in the late 1940s and 1950s, and, with a few exceptions (Skinner, 1948, 1951), was seldom discussed in the public press. Also, the language of behavior analysis was new and unfamiliar to most popular press writers. It would be unlikely that terms such as *operant* and *conditioning* would be correctly interpreted by most contemporary readers. Second, wire service or local reporters authored more than 92% of the articles; the Brelands wrote only 8%. The content of the articles depended on what the author deemed as newsworthy and understandable to the readership. As mentioned, most articles focused first on what the animals did rather than the technology behind the behavior. Finally, the style of ABE presentations emphasized the precise performance of trained animal behavior rather than human training talent. ABE animals needed little or no obvious guidance from the onstage handler. The Brelands called this handler transparency, because the handler maintained a low

profile so as not to be perceived by the audience. It was in the course of the reporter or writer getting the story during the interview that the significance of the animal training technology was uncovered. To what degree the reporter or writer conveyed the technology to the reader then depended on the author's degree of understanding and judgment.

Impact of Media Exposure

The Brelands worked in commercial settings, published few scholarly articles, and were a source of some controversy. These factors may explain why their refinements of operant training methods and success at applying these methods took place outside the awareness of many in the behavior-analytic community. This is perhaps not surprising because it was in 1994, almost half a century after the Brelands began their work, that the Association for Behavior Analysis first recognized the importance of spreading operant psychology with the creation of the Effective Presentation of Behavior Analysis in the Mass Media Award. We note, however, that if one of the key factors in the expansion of behavior analysis during the mid 20th century was its successful application outside the laboratory, then an important question becomes, how is that success measured? If successful application is documented using only the scholarly press, then there appears to be little behavior-analytic activity in animal training until the 1990s. The Brelands' role in this activity may appear to be minor if viewed from this perspective. If successful application, however, is gauged by coverage in the popular press and exposure of operant terminology to the public, the 1950s and 1960s were times of significant operant activity in animal training. The Brelands' work seems to have generated a good deal of publicity about the applications of behavior analysis for training animals. For example, in a letter to Keller Breland, Bill Rolleston, General Manager of

Marine Studios, St. Augustine, Florida, wrote, "I have read with great interest the accounts of your work in *Time* and *Life*" (Rolleston, 1955). These nationally distributed mass media articles ("Farmyard Students," 1955; "IQ Zoo," 1955) led to ABE contracts that resulted in the application of operant techniques to marine mammals and the development of operant-based marine mammal shows (R. E. Bailey & Bailey, 1996).

Two limitations should be noted when interpreting our findings. First, it is not known how representative the present data are of the population of popular media coverage of ABE from 1947 to 1966. Although the Breland-Bailey papers include more articles than could be located through traditional search methods, there may be additional accounts of the Brelands' work that would change our interpretations. An additional consideration is that a large amount of ABE material was destroyed in a fire in 1989.⁴ Consequently, the printed media examined in this paper are all that remain from the original Breland-Bailey collection and are thus only a subset of ABE publicity from the 1940s, 1950s, and 1960s that once existed. Thus, accurate inferences about the population frequency of articles about ABE and occurrence of key words cannot be made; however, the data we do have are likely an underestimate. Second, we did not focus on other animal trainers or behavior analysts who may have used operant-based training methods in commercial animal training. Although we know of no other behavior analysts who trained animals for commercial purposes in the 1940s and 1950s, the possibility exists that others besides the Brelands were actively promoting this

new technology to professional animal trainers.

We have not addressed the activities of ABE and Marian Breland Bailey from 1966 to the present or the mass media's reporting of these activities. We should note, however, that ABE commercial activities were reported in print and other media after 1966. The Breland-Bailey papers include copies and references to many of these. In addition, the National Museum of American History at the Smithsonian Institution recently accepted one of ABE's automated animal exhibits popularized by the media (Trillin, 1999). Some readers may recognize this human-chicken interactive game (see Figure 5) as an oversized and flashy version of Skinner's famous laboratory "box," complete with electronically controlled environmental climate and contingencies, but including a coin box, a device representing American enterprise.

CONCLUSION

This paper has focused on the untold history of the Brelands' successful application of operant psychology to animal training. The Brelands began Animal Behavior Enterprises in 1943 as a for-profit, applied operant enterprise. Throughout the 1940s, 1950s, and 1960s, they adapted and refined operant methods to train a wide variety of species for commercial purposes. Their operantly trained animals performed throughout the United States for advertising and for public entertainment. Contemporary popular press coverage of the Brelands and their animals indicates their presence in animal training and their promotion of operant psychology during the mid 20th century. Further, documents from the Breland-Bailey papers establish that the Brelands applied operant methods to marine mammal and exotic bird training and taught animal trainers nationwide in the 1950s.

The Brelands' story does not fit neatly into either the history of operant psychology or the history of traditional

⁴ Quite fortuitously, Marian removed four boxes of publicity and related material to her office at Henderson State University. Additional material lost included more than 25,000 catalogued photographs, over 100,000 feet of 16-mm film, training records, letters, and other documents.



Figure 5. Peggy Kidwell, Director, Mathematics and Science Museum of the Smithsonian Institution receiving an automated animal exhibit from Bob Bailey and Rae Barriner (daughter) (April 2004).

animal training. Although they were trained by Skinner and continued to associate with professional psychology organizations, the Brelands did not have traditional academic careers. They pursued a risky commercial venture and received financial success and popular media attention for their work. With the exception of Skinner perhaps, few other behavior analysts during the 1950s appeared in the popular press as much as the Brelands. They were also unlike traditional animal trainers of the 1950s. They used and promoted scientifically validated methods and published in peer-reviewed journals. Although this paper has begun to put the Brelands' work in context, it does not address the overall significance of their contributions. There is still more history of applied animal psychology yet to be told.

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