

## Afterword

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Written in late 2001 for the *Second Edition* of *Origins and Components of Behaviorology*, this Afterword provides a sense of the directions in which various contingencies were driving the independent discipline of the natural science of behavior, behaviorology, 15 years after the behaviorology movement got underway officially with the founding of TIBA (The International Behaviorology Association) in 1987. I added the Afterword to update some of the history of the behaviorology movement and discipline in a manner that avoids changing in any major way the original articles or their references (or the bibliography or the index) in the First Edition. These materials represent some historical, verbal circumstances through which behaviorology developed, for they are among the few (or perhaps they are the only) published materials written about the origin and emergence of behaviorology at the time of its emergence by participant-observers of that emergence. Thus, maintaining them intact becomes an historical priority. This brief update covers some major developments that occurred in the years from 1997 to 2002, and were reported in articles in the first four volumes (eight issues) of *TIBI News Time* (TNT) which was the newsletter of The International Behaviorology Institute (TIBI). (Actually, from the start, TNT served as a magazine for minimally peer-reviewed professional papers as well as newsletter materials. With volume 5 the name changed, reflecting this reality, to *Behaviorology Today* [ISSN 1536-6669]; see the Endnotes of this paper).

The three major overlapping developments described herein involve (a) organizational changes, (b) conceptual advances, and (c) educational opportunities. (a) The first full edition of *Origins and Components of Behaviorology* was published in April 1997, having been written over the previous several years. However, before that year was out, TIBA had changed its name to ISB (the International Society for Behaviorology). Occurring mainly under the leadership of Ernest Vargas, this change reflected a change in focus for TIBA/ISB from independence and all disciplinary components in general to a specific emphasis on the experimental science component of the discipline. To assure support also for other disciplinary components, some continuing ISB members also acted to provide an organizational locus for those other components by founding TIBI mainly as a non-profit educational organization with 501-c-3 tax status. TIBI was incorporated in New York state in early 1998, and its members were active in the other two developments. (b) Hand in hand with TIBI's educational efforts was a growing shift from describing the conceptual position of behaviorology as one of natural science versus social science (which was how some parts of the First Edition dealt with the matter) to

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This Afterword constitutes the major change that created the Second Edition. Other changes, besides the correction of some typographical errors, mostly involve references to this Afterword at appropriate points, a more relevant quote on page 296, an expansion of the information about the authors (page 320), and photographs of the second two authors, David Feeney and Glenn Latham (in an Addendum to this Afterword). The Index of the book does *not* include page references to the contents of this Afterword.

describing it in terms of the more fundamental position of natural science versus mysticism. (c) This shift was occurring as successes accumulated in developing educational opportunities for the dissemination of credit and non-credit courses in behaviorology. Each of these three developments is covered herein.

In this Afterword I will develop first the organizational changes by revisiting some of the papers that appeared in the newsletters of the concerned organizations at the time of the changes, including the summer/fall 1997 issue of *Selections*, the ISB newsletter, and the inaugural issues of TNT (volume 1) in 1998. The conceptual advances and educational opportunities will be developed by revisiting some papers that appeared in later issues of TNT (volumes 3 and 4) in 2000 and 2001.

## **Organizational Changes**

The first major development since the publication of the First Edition concerned organizational changes. I will address these changes by revisiting two papers that discussed them. The first paper dealt with some reasons for and against changing TIBA into ISB, and the second paper described the founding of TIBI. (The full version of the former appeared in *Selections* in 1997—and was reprinted in *TIBI News Time* in 1998—and the full version of the latter also appeared in *TIBI News Time* in 1998.)

### ***TIBA to ISB***

In a paper (Ledoux, 1997a) titled “Supporting both our science and the other components of our discipline,” I discussed some of the considerations, pro and con, in the transition from TIBA to ISB. Since the motion was to support mainly/only the experimental science component of the discipline, I made explicit my preference to retain an organization clearly supportive of *all* disciplinary components. However, while disciplinary independence was (and is) a crucial factor in such deliberations, my support for it in this paper mostly came through by implication. In a letter in late 1990 to colleagues who also were helping lead the behaviorology movement, Lawrence Fraley had already discussed in great detail the crucial significance and organizational implications of active and ongoing support for disciplinary independence. While I agreed with the content of this letter, I had not received it as I was teaching in China in 1990–1991. Due to its continuing significance, Fraley subsequently added an introduction and conclusion to the letter as the major part of editing it to make it an article—Fraley, 2001a—and it was published in *TIBI News Time* with the title “Defining the behaviorology movement: Critical distinctions from 1990.” This paper supplies important background to my 1997 article, and I recommend that you, dear reader, locate it (in the TNT archives at TIBI’s web site, [www.behaviorology.org](http://www.behaviorology.org)) and read it also. Meanwhile, along with some minor edits, here is most of what I said in my 1997 paper:

...Discovering appropriate directions for our efforts to build the science, discipline, community, and organizations of behaviorologists is no easy task. We could focus just on experimental science, but I think that would ultimately be a disservice not only to ourselves but also to those our science would benefit.

Yet I must confess to wanting to be involved in a scientific society—involved as a contributor doing science. I want all behaviorologists to be involved this way. But I do not see that all behaviorologists can be involved this way, nor am I convinced that this

is the way all should be involved. Behaviorologists have more to do than just conduct and report experiments, as vital as that is, if behaviorology is to make a contribution beyond our own enjoyment of experimental discovery.

Behaviorology, after all, is a comprehensive discipline that not only includes an experimental component but also philosophical, conceptual, analytical, and technological components. In one or more ways, the community of behaviorologists must assure development of all of the discipline's components. As a community we need to provide support for all behaviorologists, including those whose histories prepare them to make their best contributions in these other areas, areas other than that of performing scientific experiments. In addition, a certain interdependence obtains among these areas. Those working in each of these areas need the contributions of those working in the other areas if together they are to move the discipline forward in a balanced manner. After all, where would physics be if the theoreticians were not around to tell experimenters what to look for, and if experimenters were not around to tell theoreticians when they were losing contact with reality? And both groups not only have fun but make contributions to their discipline and the culture.

Perhaps our current organization [TIBA/ISB] should focus rather exclusively on experimental science. But if that is the full extent of our efforts, we may not be able to maintain them for very long due to other variables, current and historical, affecting our existence (for details, see Fraley & Ledoux, 1997 [and Fraley, 2001a]). We must arrange now, even as we organize a basic science–focused society, to maintain some sort of organized involvement in our other disciplinary components.

In addition, I remain unconvinced that a handful—even a handful as large as 150 [a “membership cap” that some had proposed, quite prematurely in my view], plus students—of behaviorologists, all doing basic experimental science and not much else, are going to succeed in having the kind of impact on the wider culture needed even for their own survival as behaviorologists, let alone the kind of impact that the comprehensive discipline of behaviorology can have, and should have, on that culture in so many currently needed ways...

So, in some organized way, we as a community of behaviorologists must protect and extend all of our disciplinary components, not just our experimental science component. We must respect and support our independent disciplinary status. We need not do this through our current organization, although that was in essence the original purpose of our current organization (see the history of TIBA, and its statement of purpose, in Fraley & Ledoux, 1997). If we do change the focus of our current organization, we must concurrently address these other concerns organizationally...

Meanwhile, although I am inclined against changing the focus of our current organization, I could live with doing so, especially if organizational solutions are found for the concerns of our other disciplinary components as well. And if the focus is changed, I believe the adoption of a different name should be part of the change, so as to reflect honestly the new focus. (Such changes have been in progress—see Vargas, 1997—and may already be completed.) [They were completed before 2001.]

In summary, the natural science of behavior needs to be completely organized, formally and independently, if it is to emerge fully to take its place at the natural science roundtable and meet the urgent demands of its cultural mission (see Fraley & Ledoux, 1997). Behaviorological professionals around the world need organizational structures that support *all* the components of their formal independent discipline. These struc-

tures could carry out programs of support for the world's increasingly numerous behaviorological scientists and practitioners. Organizational support is needed to consolidate the independent, natural science status of their discipline and thus to promote vigorously their professional activities. (Also, see Fraley, 1998a.)

As behaviorologists more formally organize and support the independence of their natural science discipline, and so more capably contribute to world behavioral health, another chapter is beginning in the history of the organizations of and for behaviorologists. Behaviorological scientists must have one or more organizations that promote the reality and efficacy of behaviorological science and the disciplinary interests of behaviorological scientists worldwide, and that work to establish officially the accouterments of independent disciplinary status including behaviorology's own academic homes and programs. Developments such as these may not make that much difference in the future of behaviorology; the fact of its natural science status may carry enough momentum. Then again, such developments may make all the difference in the world.

**Three related quotes:** Three quotes related to the topic of this article originally followed the article. The first of these quotes appears as the first quote on page 296 of *Origins and Components of Behaviorology—Second Edition*, while the second and third quotes appear on page 318.

### ***TIBI Founded***

In an editorial (Ledoux, 1998a) titled "Welcome to TIBI," I discussed the founding of TIBI after the transition of TIBA to ISB. Along with some minor edits, here is most of that 1998 editorial:

...Through an exchange of papers, proposals, and perspectives over the last couple of years, David Feeney, Lawrence Fraley, Glenn Latham, and I recognized certain needs, and acted to meet those needs. The needs were for an organizational structure (a) that could provide training in behaviorology, especially for those who lacked ready access to that training, and (b) that could provide support for professionals who have been trained in behaviorological science. Our actions were to found *The International Behaviorology Institute* (TIBI), a non-profit educational corporation. The materials in this [i.e., in TNT, volume 1, number 1] inaugural issue of TIBI's newsletter/magazine cover our concerns and indicate our directions. Due to the wide-ranging nature of these materials, an overview of various related historical items is in order.

Fraley and Ledoux (1997) recounted the origins and cultural mission of the natural science discipline concerned with the study of behavior, behaviorology. In the process they stressed both (a) the need to maintain disciplinary organizations fully supportive of all the various disciplinary components of behaviorology (including philosophical, experimental, conceptual, analytical, and technological components) and (b) the need to establish a variety of disciplinary homes for behaviorology, including academic programs and departments.

In 1990 Ledoux described possible curricula for training behaviorologists (see Ledoux, 1997b). Later, Ledoux (1997c) and Latham (1997) addressed the specific need to provide behaviorological training for Chinese behavior scientists who, like some professionals in other countries, aspire to bring behaviorology to bear on their country's concerns, especially in education and childcare, even though behaviorology training opportunities are few in those countries. TIBI's first visiting scholar, in the USA to study behaviorology through TIBI, introduces himself in the first TNT issue (Ma, 1998). [A

scholar who would later, in 2001, become a TIBI visiting scholar, contributed a short article in the fifth TNT issue (Li, 2000).] I wish all such students could attend, and afford to attend, programs like the one Sigrid Glenn has organized at the University of North Texas. There the differentiation between natural science discipline and mystical discipline *is* made at the departmental level. But her “behavior analysis” department is already overtaxed and so having difficulty graduating enough students fast enough to meet the demands of employers. So, on several counts, other solutions are still needed.

Ledoux (1997d) sketched the evolving nature of disciplinary organizations. And Ledoux (1997a) examined the specific need to assure continuous and actively organized support for a balance of activity in all of behaviorology’s disciplinary components, recognizing that behaviorological scientists work all over the planet and that different behaviorologists are skilled in different disciplinary components.

In the effort to meet the concerns expressed in those papers, the founders incorporated TIBI. To *better* meet these concerns, TIBI also includes a discipline-supporting association, TIBIA, *The International Behaviorology Institute Association*. The purposes of TIBI are listed in TIBI’s by-laws [TIBI, 1998] and are the same as the original purposes of *The International Behaviorology Association* (TIBA—now called the *International Society for Behaviorology*, ISB). These purposes are to be fostered through several activities, including these: TIBIA members would be encouraged to host visiting scholars who are studying behaviorology. TIBI faculty (who are TIBIA members) would arrange or provide training for behaviorology students. And TIBI would provide certificates to students who successfully complete specified behaviorology curriculum requirements.

As should be clear, TIBI (and TIBIA) are complementary with, rather than competing with, other organizations serving natural scientists of behavior locally and around the world including, for example, ISB and ABA. While TIBIA is “yet another” organization for natural scientists of behavior, it does not fragment the movement. Instead, it complements the other organizations by addressing important concerns not currently covered by any other organization. And over the last couple of years, many readers will have sensed an increasing general interest in the existence of the kind of organization TIBIA represents. I suspect that most members of TIBIA will also be active members of the other organizations.

So all readers are welcome to become members of TIBIA. You are needed to help provide the known benefits of our science to humanity.

## Conceptual Advance

The second major change since the publication of the First Edition involved a conceptual advance. This advance concerned a shift from describing the conceptual position of behaviorology as one of “natural science versus social science” to describing it in terms of the more fundamental position of “natural science versus mysticism.” I will address this change by revisiting a paper that evidences this shift.

In a paper that originally appeared in *TIBI News Time* (Ledoux, 2000a [reprinted in *Behaviorology Today*, 5 (1), 34–36]) titled “Defining natural sciences,” I discussed the status of behaviorology as a natural science in terms of its meeting the fundamental criteria expressed and implied by the historical development of the definition of natural science. Along with some small additions and minor edits, here is that paper:

...As Lawrence Fraley describes in his “About Behaviorology” article (Fraley, 2000a), today one encounters behaviorology and other disciplines, such as psychology, dealing with topics that at first blush seem to be similar. This leads some to assume that these topics are treated in similar ways. But behaviorologists define the topics differently, and treat them in ways that are radically different from the treatments of other disciplines. The concern here is to differentiate behaviorology from other disciplines like psychology, and the definition of natural science is crucial to this distinction.

Among disciplines, one particular difference will be emphasized here, because it would seem to have more impact for society than any others (see Fraley & Ledoux, 1997). This difference, a difference critical to the definition of natural science, pertains to whether or not a discipline invokes non-natural events in its explanations.

How are natural sciences defined? Fundamentally, *natural sciences are defined as disciplines that deal only with natural events* (i.e., independent and dependent variables in nature) *using scientific methods*. These disciplines always exclude non-natural events from their considerations. Other definitions are extant. However, none of them—compared with this definition—so accurately reflects the observed line of fracture dividing natural science disciplines from other disciplines. Since so much confusion stems from the distinction between natural and social sciences, that distinction will receive the attention in this discussion.

One common misconception involves the use of scientific methods. Status as a natural or social science is not determined solely by a discipline’s use of scientific methods. All natural science and social science disciplines use scientific methods. However only some of these disciplines invoke the exclusion of non-natural events from their considerations; those that do so have historically (and contemporarily) earned the title “natural science.” Even “creation science” may make use of scientific methods, but it does so while making non-natural events—the will of a mystical, faith-based being whom creation scientists consider supreme—the centerpiece of its considerations; thus it is not, and cannot be, a natural science.

Historically, the natural sciences arose out of mystical origins. In western civilization the practice of early natural science involved studies undertaken mainly to unravel the mysteries of the creative powers of the investigators’ God. Those early investigators focused on various facets of “nature” and, in doing so, developed what came to be known as scientific methods. The phrase *natural science* initially referred to the various subject matters to which such attentions were being directed. Of particular significance here is that most of these subject matters were aspects of the extrinsic environment in which the social activity of humanity was conducted; they were not aspects of how that environment controlled behavioral reactions to it, a topic which inheres in the subject matter of behaviorology.

As the natural scientists continued to pursue their work, however, the phrase natural science came to connote their emerging philosophy of naturalism—the consideration, with scientific methods, of *only* natural events (i.e., only independent and dependent variables *in nature*). Thus the phrase natural science became divorced from the original body of subject matters upon which its early investigations were focused. It came to represent an integral philosophy, naturalism (see Fraley, 1999).

Today, the connotation of the phrase natural science transcends subject matter limitations; that phrase no longer implies *what* is studied. Any subject matter can be approached in different ways, including mystically or naturalistically. A subject matter

may be approached in the way that *allows* non-natural events in its considerations, which would be a “non-naturalistic,” or mystical, approach. Or it may be approached in the way that *disallows* non-natural events in its consideration, which would be a “naturalistic” approach. In both cases *different* terms are used to name the resulting disciplines. But only those disciplines maintaining the naturalistic approach (and using scientific methods, though this need not always be mentioned) would be considered natural sciences. For example, the most common mystically based search for water is called dowsing while the naturalistically based search for water is called hydrology. The subject matters may appear similar yet, of the two, only hydrology is a natural science.

Adhering to a naturalistic perspective confers the status of a natural science on a discipline while adhering to a non-naturalistic perspective does not. The phrase natural science applies to any subject matter based on the philosophy of naturalism; it applies to any subject matter that studies only natural events (independent and dependent variables in nature) using scientific methods. Behaviorology, for example, is a strictly natural science because it applies scientific methods to study only the natural events of behavior and its independent variables.

Thus, status as a natural or social science is also not determined by the subject matter that is under investigation. One traditional notion is that “social science” refers to disciplines dealing with people issues. This is a serviceable definition that is not in conflict with the description of natural sciences as disciplines that exclude non-natural events. Accordingly, some disciplines may qualify under both of these definitions. They might then be considered both a natural science and a social science. For example, the sub area of biology (an historically acknowledged natural science) called epidemiology deals extensively with people issues, and often is considered to be a social science; yet it never sacrifices its exclusion of non-natural events and so remains a natural science. Meanwhile, another sub area of biology, medicine, also deals extensively with people issues. Yet medicine is seldom considered to be a social science; while not nearly as exact as the biology and chemistry from which it comes, it does not maintain explanatory reliance on non-natural events and so is considered to be among the natural sciences.

Status as a natural or social science is also not determined by membership in any organizational or institutional arrangement of disciplines. One example is the differing arrangements of disciplines listed in college catalogs. These placements of disciplines typically reflect the common understanding of what makes a discipline a natural or a social science. Institutions differ in their views both on which disciplines have ended explanatory reliance on non-natural events (“the natural sciences” such as physics, epidemiology, geology, etc.), and on where to put disciplines that deal with people issues (“the social sciences” such as anthropology, epidemiology, sociology, etc.). Confusion occurs because some natural sciences are also social sciences, because they deal in people issues, and so could be listed with the social sciences as well. Behaviorology is an example. More confusion occurs because some social sciences are also natural sciences, because they maintain the exclusion of non-natural events while using scientific methods, and so could be listed with the natural sciences as well. (As an additional source of confusion, some disciplines receive the “social science” label mainly *because they allow* non-natural events in their considerations—with the questions of whether or not they deal with people issues, or use scientific methods, being secondary.)

All those considerations apply to the original concern of differentiating behaviorology and psychology. At the most fundamental level, behaviorology—as a discipline—

disallows the inclusion of non-natural events in its considerations and, by that approach to its subject matter, joins the ranks of the natural sciences. However, *as a discipline*, psychology *allows* non-natural events in its considerations (although individual psychologists may refuse to do so). This approach to its subject matter constrains psychology to remain outside the ranks of the natural sciences. (On pages 128–129 of Fraley & Ledoux, 1997, Fraley discusses the improbability of psychology changing from this position. Also, see Fraley, 1992, 1998b.) So one basis for differentiating behaviorology and psychology is that they do not share a common approach to their subject matters, with only behaviorology qualifying as a natural science (see Fraley, 2000b).

In addition to the differences in *how* they approach the study of a subject matter, psychologists and behaviorologists do not define their subject matter in the same way, even though both engage in studies of behavior. So they can be differentiated on that basis as well. The subject matter of behaviorology, which it approaches naturalistically, is the functional relations between behavior and independent variables. The most helpful and productive of these variables are in the external environment and are subject to interventions that bring about beneficial behavior changes (with common yet sophisticated examples being the behavior-engineering skills used at home and in school; see Latham, 1994, 1998). However, the subject matter of psychology, which it approaches non-naturalistically, is the hypothesized relations between behavior and a range of variables, including the psyche, mind, self, and other non-natural, magical, mystical internal agents that are put forward as causes of behavior. But the causal status of those variables cannot adequately be assessed because they are non-natural and cannot be scientifically tested in spite of attempts to rely on scientific methods to do so. As a result, psychology cannot directly change these non-natural variables and must instead rely on intuitive approaches regarding what might be done with real variables to produce helpful behavior change (see the appendix on “Adventitious Control,” Ledoux, 1997e).

Calling behaviorology a natural science, however, causes discomfort for some people, because classifying behaviorology as a natural science is not in keeping with common though misplaced perceptions of what constitutes natural sciences (see Fraley, 2000c). The most common misperception, previously mentioned with respect to college catalogs, is that “natural science” is defined by traditional membership in a certain group of disciplines (the group comprised of physics, chemistry, etc.) when instead *the membership of a discipline in that group is itself defined by the excluding of non-natural events from the considerations of the discipline*. It is *that exclusion* that (a) defines a discipline as a natural science and so (b) automatically places it among the group of disciplines known as natural sciences. Any discipline that fails to exclude non-natural events from its considerations is not to be found in that group, while every discipline that relies exclusively on real variables is in that group, *regardless of how long ago or how recently that distinction was invoked*. (Of course, higher education administrators sometimes locate natural science disciplines in other administrative units for reasons that are little related to those disciplines’ membership in the natural science group. Such action, however, does not alter the validity of those disciplines’ membership in that group.)

More significantly, while every discipline that excludes non-natural events from its considerations, and uses scientific methods, is in the natural science group, not all such disciplines became part of this group at the same time—and *that* is yet a further source of confusion. There was a time when no disciplines were natural sciences. Then, starting several hundred years ago, there was a period in which subgroups of members of

several different disciplines did begin excluding non–natural events, at least from their inquiries if not from their motives. Eventually that path, for the groups that took it, converted their disciplines into natural sciences. And thus appeared (though the details are beyond the scope of this article) many of the usual natural sciences we know today (physics, chemistry, biology, geology, astronomy, etc.).

Quite some time has passed since a subgroup of a non–natural science discipline took the step of excluding non–natural events from its considerations. But this can still be done. From among the professionals in *any* discipline that maintains a *non*–naturalistic perspective, a subgroup can take that step and, in so doing, create a new natural science of its subject matter. In the twentieth century, a subgroup of the professionals operating within psychology took precisely that step (see Fraley & Ledoux, 1997, for the historical details). This subgroup followed the centuries–old lead of other natural sciences and excluded non–natural events from its considerations. By doing so, and thus creating a critical discontinuity between themselves and those remaining behind in the original non–naturalistic discipline, these professionals created a new natural science of their subject matter. This natural science came to be called behaviorology.

While those professionals initially called their natural science “behavior analysis,” a political rift arose among them that resulted in the organizing of those calling themselves behaviorologists (see Fraley & Ledoux, 1997). Today, while *behaviorology* is the *independently* organized natural science of behavior–environment functional relations, *behavior analysis* has become largely a political movement for natural scientists of behavior who are devoted to (a) developing new scholars and scientists (of naturalistic behavior–environment relations) through attempts to convert to naturalism the members of another discipline, psychology, that is committed to the non–naturalistic perspective, while (b) keeping the behavior analytic proponents in contact with the copious resources of those on whom they exert their conversion efforts. Within the behavior analysis movement, the relative strength of these two motives varies from person to person. However, the behaviorologists, in general, entertain neither of those motives, regarding the former as impractical and the latter as a stretch of ethics (see Fraley, 1998c and 1997, for elaboration).

Substantial progress in knowledge and applications attended the long ago creation of the traditional *natural* sciences. That same kind of progress has attended the more recent emergence of the natural science of behavior now called behaviorology. This progress is reflected in the advances in principles and practices applied in many major areas of human concern. For some details on those advances and applications, see the bibliography in Ledoux, 1997f. Meanwhile, no one should be surprised that behaviorologists’ concern with scientifically solving *human* problems has led some people to wish to categorize it *both* as a natural science (using the definition of natural sciences as disciplines that exclude non–natural events) *and* as a social science (using the definition of social sciences as disciplines concerned with people issues).

## Educational Opportunities

The third major change since the publication of the First Edition concerned an increase in the educational opportunities for disseminating behaviorology through credit and non–credit courses. I will address this change by revisiting a paper that documented

some of these opportunities. (The full version of this paper appeared in *TIBI News Time* in 2001. The grant to develop a “Certificate in Autism Recovery Training,” from the New York State Department of Education, was received too late to be discussed here.)

In a paper (Ledoux, 2001a) titled “Developing opportunities to disseminate the natural science of behavior,” I described the increased number and sources of credit and non-credit behaviorology courses available to the public. I also described some of the history and circumstances that led to the availability of these courses. Along with some minor edits, here is most of what I said in my 2001 paper:

...This article serves to update behaviorological scientists and practitioners regarding the growing number of behaviorology courses available through both TIBI and regular university course offerings. Articles in past issues of TIBI’s newsletter also addressed this topic (see Ledoux, 1998b, p. 4; 1999a, p. 2). While some details have changed since those articles appeared, the general trend they report continues. This article will describe the successes to date (fall 2001) in developing courses to disseminate behaviorology through the author’s university campus—the State University of New York at Canton (SUNY–Canton)—as well as through [www.behaviorology.org](http://www.behaviorology.org) which is TIBI’s web site.

Behaviorologists at other institutions of higher education should also provide descriptions of their successes disseminating this independent discipline for publication in future issues of the TIBI newsletter/magazine. This independent discipline is the natural science of behavior known as behaviorology (though originally known as behavior analysis—see Fraley & Ledoux, 1997, for a discussion of the name change). That is, behaviorology is the independent discipline of strictly *naturalistic* explanations of behavior and so it should not be confused with the discipline of fundamentally *mystical* explanations of behavior known as psychology. (In practice psychology, as a discipline, requires even its dissenting members to allow the mysticism inherent in granting causal status—through an inner agency of behavior origins—to minds, psyches, selves, etc. For elaboration, see Fraley, 2000a, 2000b, 2001b; also, see Ledoux, 2000a).

This article will also consider some early factors relevant to successfully developing courses to disseminate behaviorology. Some of these factors are available to behaviorological scientists and practitioners at other institutions of higher education. Perhaps the presence of such factors will prompt similar successes on the part of others, thereby substantially moving forward the natural science of behavior and the contributions it makes to the human community.

### ***Successes Through Fall 2001***

Before the end of 2004, TIBI is committed to having ten behaviorology courses available online. To the extent possible, TIBI wants these courses to be offered at three levels:

(a) The first level is to offer the courses for free. This level is for those who simply want to expand their repertoires—by downloading a course syllabus from TIBI’s web site, purchasing the course materials from a book seller, and working through the course solely on their own—but who do not want or need any sort of credit toward TIBI certificates or regular academic degrees.

(b) The second level involves paying TIBI tuition and being assigned a TIBI faculty member to help cover course content (while working through the course after downloading the course syllabus from TIBI’s web site and purchasing course materials from a book seller). This level is for those who want to earn TIBI credit toward one or another of TIBI’s certificates but who do not want or need regular academic credit.

(c) The third level is for those who want or need regular academic credit, perhaps toward an official degree from an institution of higher education. (While TIBI's non-profit, 501-C-3 incorporation required the consent of the New York State Education Department, TIBI is not accredited to offer "degrees.") At this level each course TIBI offers on its web site includes a list of any regular academic courses, offered by institutions of higher education, that TIBI considers equivalent. Students can then contact the institution of their choice about taking the course, paying that institution's tuition, and getting that institution's credit. (Students who take such equivalent courses also automatically accumulate TIBI credits toward TIBI's certificates. See TIBI, 1999, particularly pp. 12-14 and pp. 15-16, for details on TIBI's certificates and courses; by design, the TIBI Board of Directors modeled these courses and certificates on those in Ledoux, 1997b.)

The value of successes with regular academic courses resides in that third level. Currently SUNY-Canton has seven behaviorology courses. All of them were proposed and approved explicitly as "behaviorology" and "natural science of behavior" courses. The first five were also proposed and approved with a "BEHG"—behaviorology—designator for the course number (e.g., BEHG-135). The designator was changed to "SSCI"—the designator for social science—by the Curriculum Committee at the suggestion of the Deans who were concerned to insure that students would be able to transfer these courses to other colleges. Also, the behaviorologist designing and proposing these courses was a professor in the Department of Social Sciences. In this context the concept of "social science" inheres more in the concerns of the various "social science" disciplines for people issues than in any competition with, or alternative to, the natural sciences. Since, ultimately, behaviorology courses should be academically housed with the natural sciences, the review of some origins and definitions of natural science [in this Afterword] is relevant to this discussion. [Readers were then referred to Ledoux, 2000a.] (The last two of the seven courses were proposed and approved after the decision to use the SSCI designator.) Here are brief descriptions of all seven courses:

✦ **SSCI 135: *Parenting Knowledge and Skills*** (equivalent to TIBI's BEHG 201: Non-Coercive Child Rearing Principles and Practices): This course provides students of any age and interest (i.e., parenting or child care) with the scientific contributions of behaviorology that can instill or enhance the knowledge and skills for caring for children in effective, pro-active, non-coercive, positive, and loving ways.

✦ **SSCI 245: *Introduction to the Science and Technology of Behavior*** (equivalent to TIBI's BEHG 101: Introduction to Behaviorology I): This course, the first of a two-course sequence and the prerequisite of all higher courses, provides students with a solid grounding in the various components of the behaviorology discipline. The areas covered include fundamental principles, basic experimental research methods, elementary techniques of behavior/environment engineering, historical and philosophical perspectives, and trends.

✦ **SSCI 345: *Applied Science and Technology of Behavior*** (equivalent to TIBI's BEHG 102: Introduction to Behaviorology II): This course, the second of a two-course sequence, provides students with general applications of the principles of behaviorology by focusing on a range of problem prevention and intervention techniques and considerations (e.g., ethics) in a range of settings.

✦ **SSCI 365: *Behavior Engineering: Rehabilitation*** (equivalent to TIBI's BEHG 400: Behaviorological Rehabilitation): This course provides students with the application of behaviorological considerations to help improve human interactions and success rates

in institutional rehabilitation settings such as hospitals and prisons. The course emphasizes the use of the more effective, science-based practices to replace the unscientific emphasis on coercive practices in these settings. Both adult and youth clients and offenders receive consideration.

✦ **SSCI 375: *Basic Autism ABA Methods*** (equivalent to TIBI's BEHG 415: Basic Autism Intervention Methods): This course provides students with the behavior engineering practices and skills valued in the recovery of children from autism. Topics include (a) the different roles of professionals, paraprofessionals, and school systems, (b) training curricula and programs, (c) home- and center-based programs, and (d) the organizational and legal supports available to autistic children and their families.

✦ **SSCI 455: *Performance Management and Preventing Workplace Violence*** (equivalent to TIBI's BEHG 420: Performance Management and Preventing Workplace Violence): This course provides students with three levels of application of behaviorological considerations appropriate to preventing workplace violence. The most general level examines the role punishment and coercion play in prompting violence of all types throughout society. The middle level focuses on the use of effective behaviorological practices for performance management in the full range of workplace settings to replace the unscientific emphasis on coercive management practices thereby *preventing* the violence such practices may themselves induce. The most specific level focuses on the various recommended policies and procedures for *detering* the actual occurrence of workplace violence.

✦ **SSCI 465: *Classroom Management and Preventing School Violence*** (equivalent to TIBI's BEHG 425: Non-Coercive Classroom Management and Preventing School Violence): This course provides students with three levels of application of behaviorological considerations appropriate to preventing school violence. The most general level examines the role punishment and coercion play in prompting violence of all types throughout society, from interpersonal and family relations, through educational and workplace situations, to international and cultural relations. The middle, and most significant, level focuses on the use of effective, non-coercive behaviorological practices and skills for classroom management. These replace the unscientific emphasis on coercive classroom "discipline" practices thereby *preventing* the violence such practices may themselves induce. The most specific level focuses on the various recommended policies and procedures for *detering* the actual occurrence of school violence in situations where violence has become likely.

Each of those seven courses would be offered both as TIBI courses by TIBI online, and by SUNY-Canton online. By fall 2001, four of the seven were already being offered online at TIBI and were ready to be offered online at SUNY-Canton. Using SUNY-Canton's numbers, these four were 135 (the child care course), 245 (the basic discipline course), 345 (the initial applied behaviorology course), and 465 (the classroom management prevents school violence course). Together, the first three of these courses (i.e., 135, 245, and 345) fulfill the requirements for TIBI's basic *Behavior Literacy Certificate*.

Of course, the progress of seven approved courses did not occur in a vacuum. Several factors came together to enable such success. Some of these are generally available to other behaviorologists, or can be arranged. Others are unique to SUNY-Canton. Most of these factors are discussed next.

### ***Factors Relevant to Success***

The personal story begins about fourteen years ago (1987), the same year as the founding of TIBA (The International Behaviorology Association, which later changed its name to the International Society for Behaviorology—ISB) which was about ten years before the current successes began. I arrived at SUNY–Canton in 1982, and five years later (1987), I proposed a typical “psychology” behavior modification course. The department approved the proposal (though not unanimously as psychology instructors were department members and some opposed the proposal). However, the Dean at the time, who has since retired, was disinclined to move the course forward, and stalled it permanently. Little happened at SUNY–Canton over the next ten very long years.

However, during those intervening years, a variety of events accumulated which prepared a foundation for the possible success of renewed efforts. For instance, as my TIBA presidential address (Ledoux, 1997b), I developed a set of consensus–based behaviorology curricula to begin answering the questions, “What [would] we want to do with behaviorology training time when we behaviorologists are responsible for *all* of it? How should behaviorologists be trained?” (p. 174). The publication of that paper in a book on the broad components of the behaviorology discipline (Ledoux, 1997f) caught my administrators’ attention when they received a complimentary copy.

Also, when I returned from an academic year teaching in China (1990–1991), I reported the speed with which my three invited behaviorology course proposals (two graduate courses—one on verbal behavior and one on educational behaviorology—and one undergraduate course, also on the latter) were approved and scheduled: The whole process took less than three weeks! This too grabbed some administrative attention.

Three other factors lent credibility to development efforts. One was the already mentioned incorporation of TIBI with the consent of the New York State Education Department. Another was the separate existence of another behaviorology professional organization, ISB, and my circulating each organization’s newsletters as they arrived, along with demonstrating TIBI’s web site. The third was TIBI’s successful proposal to SUNY–Canton that the two co–sponsor visiting scholars from China who are interested in coming here to study behaviorology. The first visiting scholar, Professor Ma Wen (see Ma, 1998, 1999, 2000) earned TIBI’s *Professional Studies in Behaviorology Certificate*. And our second visiting scholar from China, Professor Li Fangjun (see Li, 2000) arrived at the college in August 2001 for the 2001–2002 academic year.

In the same time frame, other factors occurred that also increased the chances of success for renewed development efforts. For instance, SUNY–Canton received approval to begin offering four–year “Bachelor of Technology” (BT) degrees. This approval instantly created the need for upper division courses to support such degree programs. (And, in a cash–strapped college environment, development efforts are certainly not hurt by SUNY allocating more dollars to campuses for their upper division courses.) Also, local employers were weighing in with letters supporting behaviorology courses in terms of the number of behaviorology–knowledgeable students these employers would hire annually if they could. Such letters were received from the local ARC and from United Helpers. The local chapter of Families for Early Autism Treatment (FEAT) also provided support for behaviorology development efforts.

At the same time as renewed behaviorology–development efforts went forward, SUNY–Canton was also becoming increasingly interested in two related areas, both of

which supported such efforts. One was in offering online courses in general. This is something for which most behaviorology courses are well-suited, since the discipline itself would be applied in teaching them (as it is the most effective informing science for education, using the shaping model of education rather than the presentation model; see Vargas, 1996). And TIBI would be offering online behaviorology courses anyway. The other area of interest for SUNY-Canton was in offering online courses to China in particular. The college had received a grant to arrange such courses and I had substantial experience both with China and with one of the online course areas of probable interest to Chinese universities: applied behaviorology (Ledoux, 1997c).

This variety of factors seemed supportive of renewed development efforts. Hence I began developing behaviorology course proposals in late 1997.

### ***Local Steps to Success***

The first course I proposed was a basic introduction to behaviorology course (titled sSCI 245: Introduction to the Science and Technology of Behavior). It was a lower division course and, should it succeed (which it did), it would serve as the fundamental prerequisite course for more advanced behaviorology courses.

As the college became more involved in four-year degree programs, and the need for upper division courses increased, I developed four additional course proposals, only one of which was appropriately a lower division course without a prerequisite. (Actually I had developed five course proposals, but one was considered a bit thin and so did not pass the department. I reworked it and resubmitted it later successfully as one of two newer courses.) These four were (a) sSCI 135: Parenting..., (b) sSCI 345: Applied Science and Technology of Behavior, (c) sSCI 365: ...Rehabilitation, and (d) sSCI 465: Classroom Management and Preventing School Violence. To improve the chances of success, each course topic reflects a major, meaningful behaviorology application area. Most are also potentially useful to one or another of the college's initial four-year BT degrees. The courses are also appropriate to some future BT in "Behavior Technology."

Subsequently, in focusing on two further areas that served community needs, college needs, and/or BT-program needs, I developed two more upper division courses: sSCI 375: Basic Autism ABA Methods, and sSCI 455: Performance Management and Preventing Workplace Violence. These brought the total number of behaviorology courses to seven.

When the Dean has scheduled any of these courses, I have taken steps to improve their chances of success. One step involved enabling sSCI 135 and sSCI 245 to serve as alternative courses for students who usually get put into the intro psych course but who do not need that course as their curricula do not require it or any advanced psych course (for which intro psych is the prerequisite). This way, some of my regular behaviorology sections cover the students who would otherwise have been in psych sections that I would have had to teach. Another step involved producing and distributing flyers to assure that students and advisors were aware, during each pre-scheduling time for the following term, of the behaviorology courses being offered. (Distribution was not difficult. The Dean's office sent the flyers to the faculty advisors, and the Student Life office put them up in the dorms.)

With only one behaviorology professor, seven behaviorology courses is probably too many when all need to be taught, some every term, others at least occasionally, and all both face-to-face and online. Over the next couple of years, I hope to teach each course both ways, with an online version offered both by SUNY-Canton and by TIBI.

Meanwhile, I anticipate the opportunity to expand this set of courses, and develop it into certificates and degrees [successes so far (by 2004): a verbal behavior course and two autism intervention certificates]. This may also be the only way to “get some help,” that is, enable the hiring, in due time, of additional behaviorologists as faculty members. (Just think of all the job descriptions properly trained behaviorology students can fill, and how many more students could be taught by more than one professor...)

Another factor, one which I could *not* use to enhance success, involved being able to say that so—and-so college already offers *Behaviorology* courses (approved as such). At least now, behaviorologists at other campuses *can* say that!

### ***Educational Opportunities Summary***

In every institution of higher education, factors already exist that affect the likelihood of success for efforts to develop dissemination opportunities for behaviorology and its applications across human concerns. The only guarantee of failure is not to try. This article identified and addressed some supporting factors which, when added to the local mix, could tip the balance in favor of further success. As readers include such factors in their dissemination efforts, successes should continue to accrue.

## **Connecting These Articles**

The development of educational opportunities for behaviorology (as discussed in the third part [article] of this Afterword), based on the natural science status of behaviorology (as discussed in the second part), may prove to have particular significance for the question of concrete disciplinary directions (as discussed in the first part). For the presence of these opportunities not only bodes well for the continued development of behaviorology, but this presence also supports the position that disciplinary organization should not emphasize any one disciplinary component over any other. Rather, disciplinary organization needs to support all components of this separate and independent natural science discipline.

## **Other Elements of Progress**

Progress also continues to appear and develop in several other areas. Beyond the founding of TIBI, the offering of behaviorology courses and certificates, the dissemination of new publications, and the hosting and training of visiting scholars, progress is evident (a) in new courses and curricula offerings at other institutions of higher learning, (b) in initial TIBIA membership patterns, (c) in the recognition of disciplinary status for behaviorology in non-Western countries, (d) in the continuing concern with the status of the name “behavior analysis,” (e) in the publication of a continuing stream of books and articles covering aspects of the natural science of behavior/environment relations, and (f) in other organizational efforts. Each of these will receive coverage in turn.

The actual numbers and locations of courses and curricula covering behaviorological content are difficult to track. While SUNY-Canton and TIBI offerings have already been described, the previously mentioned behavior analysis program at the University of North Texas (UNT) is also a significant development. Given the demands of employ-

ers for graduates with behaviorological knowledge and skills, that program has expanded to departmental status (and still has difficulty keeping up with demand). That expansion has occurred *independent* of UNT's psychology department. This is a major breakthrough in efforts to secure the future of behaviorological science. UNT, its Behavior Analysis Department, and all the faculty, administrators, staff, and students involved need and deserve—as do those involved in any other programmatic breakthroughs—the fullest, most open, and continuous support of all behavior analysts and behaviorologists (i.e., behaviorological scientists and practitioners) worldwide. Of major significance is the fact that in the programs of UNT's Department of Behavior Analysis (whose programs, and thus department, were named prior to the current usage of the term behaviorology), students study the natural science of behavior for its own sake and learn to disallow—with all other natural sciences—the inclusion of non-natural events in scientific explanatory accounts; in contrast, in UNT's Psychology Department, students are necessarily taught to allow non-natural events in explanatory accounts of behavior (see Fraley, 1997, 1998c).

Perhaps in the initial pattern of TIBIA memberships one can also sense the directions that prevailing contingencies favor. After the four founders, the next four members to join TIBIA, at any membership level, included three professionals from China (two temporarily residing in the USA and one in Xi'an, China), and one professional from Canada. After these, others joined, including professionals from the USA.

What other impact might the rest of the world have on the future of natural science regarding behavior? Consider that over the next century (or two?) Western physiological psychologists who prefer the natural science approach of physiology may finally purge their discipline (or their part of the psychology discipline) of the unnecessary and unhelpful acceptance of non-natural entities/events from psychological explanatory accounts. (However, doing so will require their separation from psychology unless new contingencies promote the most fundamental change in the psychology discipline's mystical foundation itself—see pp. 128–129 of Fraley & Ledoux, 1997.) Those professionals and behaviorological professionals may *then* desire—and be able to achieve—a useful combination of their two natural science disciplines, the former emphasizing mechanical causality and the latter emphasizing selection causality. Part of the impetus for these events may come from the non-Western world. This is because the dichotomy between the mystical discipline of behavior (psychology—allowing non-natural events in explanatory accounts) and the natural science discipline of behavior (behaviorology—disallowing non-natural events in explanatory accounts) may prove to have been a mainly Western (USA and Europe) phenomenon. Other countries (e.g., China) that lack the West's thorough cultural grounding in dualism may more readily combine, in their behavior science discipline, both the natural science, mechanical-causality-emphasizing facts, research, and applications of physiological “psychology” and the natural science, selection-causality-emphasizing facts, research, and applications of behaviorology. If successful in both research and applications, such inclusiveness in the behavior science disciplines of non-Western countries could serve as a substantial prompt to a Western recombination purged of mysticism. (Given that each component is a comprehensive discipline, any such combination may seldom manifest in the repertoire of any individual professional because most individuals cannot afford the costs of acquiring more than one disciplinary repertoire.) In any event, these possibilities are probably several professional lifetimes away.

Resolution of the status of the “behavior analysis” label also progresses only slowly. The directions that prevailing contingencies favor is unclear. I personally would welcome a day when that label stands free and clear of any claims or connotations other than as a potential name for the independent natural science of behavior informed by the philosophy of radical behaviorism. However, with psychology also claiming this label, due to a shared history (see Ledoux, 1997g), I must admit to doubts that this could happen. Still, should it happen, behaviorological science professionals could then select whichever label works best; at that point I could be comfortable with either behavior analysis or behaviorology. In either case, *Origins and Components of Behaviorology* has documented much of the historical foundation that will have brought behaviorological professionals to such a decision point. And that foundation may even lead us to use both labels (e.g., “behaviorology” for the basic science component and “behavior analysis” for the applied science component). While any movement toward clarification of this issue is progress, its resolution is also several professional lifetimes away.

Progress also continues to appear through the publication of more books and articles covering aspects of the natural science of behavior/environment relations. Various samplings cover a wide range of topics.

A list of recent and relevant books includes *General Behaviorology* (Fraleley, 2001c), *First Course in Applied Behavior Analysis* (Chance, 1998) which acknowledges the appropriateness of the behaviorology label (see p. 36), and a revised edition of Murray Sidman’s *Coercion and Its Fallout* (Sidman, 2001). It also includes *Behavioral Intervention for Young Children with Autism* (Maurice, 1996), *The Power of Positive Parenting* (Latham, 1994), *Keys to Classroom Management* (Latham, 1998), and a unique and non-technical novel that covers our natural science and its place in society: *The Millennium Man* (Wyatt, 1997; also, see Ledoux, 1998c, for a review). Also, Maurice (1994) has provided a non-technical analysis of autism and its behavioral interventions, Engelmann (1992) has comprehensively analyzed academic child abuse, and Watkins (1997) has examined the fallout from the way the education establishment has ignored Project Follow Through data (and resisted implementing the recommendations implied by the Project’s results). In addition to books like these, more and more behaviorology study guides (i.e., books of study questions) for use with several basic textbooks are becoming available (e.g., see Kopp, 2001; also see Ledoux, 1999b, 2000b, 2001b, and 2002).

A list of recent articles from just one behaviorology author covers the challenges to determinism in modern science (Fraleley, 1994a), some issues in verbal behavior analysis (Fraleley, 1996), and an analysis of correctional systems (Fraleley, 1994b, 1994c). It also includes a four-part analysis of thanatology (Fraleley, 1998d, 1998e, 1998f, and manuscript). Such a list would also cover some concerns in disciplinary development, including reflection on the adverse implications of economically driven policies for university teaching (Fraleley, 1998g), reflection on an appropriate academic home for our natural science discipline (Fraleley, 1997, 1998c), and reflection on philosophical differences (Fraleley, 1998b).

And so much more continually becomes available, not only in and through the disciplinary efforts and publications of TIBI, but also through the International Society for Behaviorology, the Cambridge Center for Behavioral Studies ([www.behavior.org](http://www.behavior.org)), and the Association for Behavior Analysis. With the kinds of momentum prompted by the developments described in this Afterword, the future indeed looks bright. ☺

## Endnotes

After TIBI published four volumes (eight issues—two each year) of its magazine/newsletter in four years (1998, 1999, 2000, and 2001), the name changed from *TIBI News Time* (with no ISSN) to *Behaviorology Today* (ISSN 1536-6669). The contents of that publication will likely contain much of the history of behaviorology beyond the history contained in this book. To maintain all of TIBI's then print-published legacy under one title/ISSN, all of the papers and relevant administrative/newsletter materials in those first four volumes were scheduled to be republished in volume 5, the first volume under the new name. The Spring 2002 issue (volume 5, number 1) was also to include the *Table of Contents* from each of the eight previous issues so that any items not republished could still be found (both online and off). Readers wishing to track the continuing developments in all components of the behaviorology discipline are encouraged to follow the contents of all volumes of *Behaviorology Today*.

A last historical note concerns TIBI's origins. The incorporation of TIBI was based on a DBA I had filed in 1990 but had not used. The proposal for that incorporation, which I sent to the other three founders in the summer of 1997, included not only a rationale for founding TIBI but also drafts of such items as by-laws, letterheads, and brochures. The other founders made improvements to these documents and together we founded TIBI, with its association component (TIBIA), by initiating the incorporation process in November of 1997. After the New York State Department of Education granted the necessary "consent to filing," the incorporation process was completed on 20 February 1998.

Some layout decisions regarding the First Edition of this book may have caused inconvenience for some readers. Particularly, the page margins leave little room for white space or notes. Yet the combination of type size/leading (12/13) and line length (5.5 inches) are within normal typographical specifications for the typeface (Adobe Garamond) and result in a readable and legible book. The margins, however, were determined more by the printer's page-size options than by the line length; the preference for saving trees was the determining factor in selecting among the page-size options.

The author thanks David Feeney, Lawrence Fraley, and Glenn Latham for reviewing parts or all of this Afterword. Address correspondence regarding this Afterword to the author at SUNY-CTC, Canton NY 13617-1096 USA.

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## Supplementary Bibliography

*In addition to Latham, 1994 and 1998 (and the study question books for these two [Ledoux, 2000b, 2001b], all four of which are listed in the “References” section of the Afterword to Origins and Components of Behaviorology—Second Edition) here are some works that are also particularly helpful for parents and teachers:*

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- Latham, G.I. (audio program: 1 cassette; recording of a presentation at an international conference for parents). *Behind the Schoolhouse Door: Eight Skills Every Teacher Should Have*. Garden City, NY: Eyedears A/V. [Call 516-739-8864 for tape # 20-ASAT-12]

*And these books are for those with some theological persuasions:*

- Latham, G.I. (1997). *What’s a Parent to Do?* Salt Lake City, UT: Deseret Book Co.—incorporating LDS (Mormon) theology.
- Latham, G.I. (1999). *Christlike Parenting*. Seattle, WA: Gold Leaf Press—incorporating Christian theology.

**Note:** Dr. Latham is not the only author of quality materials on these topics. However, they are included here because his peers have judged his work to be the very best available. (For example, see “About the Book” on p. vii in Ledoux [2001b] *Study Questions for Glenn Latham’s “The Power of Positive Parenting.”*)

**Also note:** Most of these items can be obtained directly from *Parents & Teachers ink* at either 435-752-5749 or toll free (for credit-card orders only) at 1-888-750-4814.✠