

Chapter 6:

Interdisciplinary Context: A Cultural Role for the New Discipline

After the introductory Chapter One, Chapter Two of this account of the emergence of behaviorology examined the nature and origins of the behaviorology concept. Chapter Three examined contingencies supporting individual commitments to a disciplinary independence movement. Chapter Four presented a comprehensive review of the activities to organize the behaviorology discipline and examined the cultural engineering by which the behaviorology discipline was formalized and installed in the community of natural sciences. Chapter Five reviewed the prevailing cultural milieu and analyzed the support for, and the opposition to, the behaviorology movement. This chapter, Chapter Six, the last of the five main parts of this account, examines the prevailing views of the early behaviorologists on where their discipline fit both among the community of natural science disciplines extant in the culture and in the cultural marketplace. It also comparatively explores the different levels of analysis characteristic of behavior-related natural science disciplines, and examines the cultural basis of resistance to behaviorology.

The early behaviorologists faced many questions about where their discipline fit with respect to other established disciplines and fields. This was only natural since they accepted the relationship of their discipline to other behavior-related fields as one of supplying an effective foundational science and technology of behavior.

The Cultural Context of Behaviorology

Early behaviorologists defined and formulated behaviorology in a way that allowed it to function well in a quality controlling capacity at the hub of a metaphorical wheel representing scientific contributions to global cultural development. At that hub are all existing basic behavior-related disciplines. They exhibit different philosophical approaches, some mutually incompatible and each contesting for control. That includes behaviorology (with its particular natural science philosophy) as well as its disciplinary competitors. The spokes are the various behavior-related fields, which share in defining and imparting identity to human culture. The lengthening of the spokes occurs as those fields develop through the effectiveness of their respective behavioral technologies. The expansion of the rim connotes the expansion of our culture in all of its diversity. The whole process functions only as well as the basic repertoires at the hub can support it. Behaviorologists asserted their independence in order to address that central mission better.

In the broad context of science, the place of behaviorology is determined in three ways: (a) by the qualities that make it a natural science (as opposed to a non-natural or pseudo-science), (b) by the kind of analyses that it features to best address the problems to which it is directed, and (c) by the nature of the subject matter under study. Being a *natural* science like chemistry, physics, or biology means that the epistemology and ontology of behaviorology respect a continuity in any functional chain of material

events that define time. Natural science allows no breaks in that chain of events—that is, no discontinuities in the functional chain of material events that accumulate, link by link, in what is called a *natural history*. In a non-natural science, those linkages of material events are said to be broken on occasions of intervention by non-material, or metaphysical, events (e.g., the non-spatiotemporal activities criticized by Hayes & Brownstein, 1986).

Disciplinary repertoires that posit or tolerate non-physical *mentalistic* entities, believed to intervene and play a causal role in determining behavior, classify as non-natural behavior sciences (if the term “science” is even deemed applicable in such cases). Hence they are frequently designated as “soft” sciences (generally understood as a polite euphemism for epistemologically sub-standard). The phrase “social sciences” was originally coined to describe sciences focused on interactive behaviors among people. But it has also come to denote multi-paradigmatic approaches as well, including some that entertain appeals to metaphysical phenomena (Skrtic, 1991). Not only has this issue yielded internal struggles in psychology, but also in other social sciences like anthropology and sociology (despite efforts to recast sociology as a natural science, e.g., Burgess & Bushell, 1969; Hamblin & Kunkel, 1977; and Homans, 1961).

Culturology

The subsequent discussion of behaviorology among the life sciences features the term “culturology” which is used here to fill a gap in the labeling of the domains of concern across the life sciences from molecules to cultures. That term, like behaviorology, has had various origins (e.g., see White, 1949, pp. 115–117 & 409–415; Stephen Ledoux had also composed it independently in 1986). Culturology, like behaviorology, is etymologically appropriate: “the study of culture.” Just as the discipline of behaviorology has a scientifically informed philosophy of science, known as radical behaviorism, a similar philosophy of science is developing among certain schools within the broad field of anthropology, for example, the cultural materialism of Marvin Harris (Harris, 1979). While the people who represent those schools of thought will ultimately declare their philosophies and name their own discipline, *culturology* appears here as the interim name for that discipline for its convenience in avoiding long and possibly inaccurate labels such as “anthropology informed by cultural materialism.”

Behaviorology Among the Life Sciences

The natural sciences traditionally divide between physical sciences and life sciences. Behaviorology and other foundation life sciences rely heavily, though not exclusively, on the causal mode of selection in their explanatory frameworks. In contrast, foundation physical sciences, such as physics and chemistry, have depended more on mechanical causality. (See Skinner, 1987a, Ch. 4, for details on this distinction.)

The scientific study of life, especially human life, stretches across several levels of analysis. On one end is the discipline of biology, chiefly studying, across the entire history of each species, the physical and chemical activities of individuals from the sub-cellular level to the level of the organism. “Behavior” as subject matter in biology can be approached from those physiological foundations. But what can be learned about behavior on that basis tends to be insufficient for *practical* purposes in social and environmental contexts, and often needs to be supplemented by appeals to behavioral science at a different paradigmatic level. This happens, for example, when attention turns

from *how* a body behaves to *why* an organism behaves. Behaviorological engineering is difficult to support when it is based on scientific principles induced from strictly biological investigations of behavior. However, some biologically informed animal behaviorists have found reason to expand their physiologically based studies of behavior to consider behavior/environment relations—thus contributing to a science of behavior from their side of the disciplinary overlap with behaviorology.

On the other end of the life science continuum is the discipline of culturology, chiefly studying the social behavioral/cultural activities, especially of verbal species, at the level of the group or population. “Behavior” as subject matter in culturology is essentially the study of group-produced effects, for example, the combined or synergistic effects of concerted individual behaviors. The shared practices of a people that give their group its cultural identity are of interest in culturology as well. Importantly, the group behaviors of interest to culturologists can endure beyond the range of individual lifetimes. Naturally, in conducting their studies culturologists concern themselves to some extent with the behavior of individuals. In doing so they share some concerns with behaviorologists.

Between biology and culturology is the discipline of behaviorology, chiefly studying the functional relations between the environmental milieu and the behavior of individuals. With this focus behaviorology overlaps many behavior-related concerns in both biology and culturology. See Figure 1.

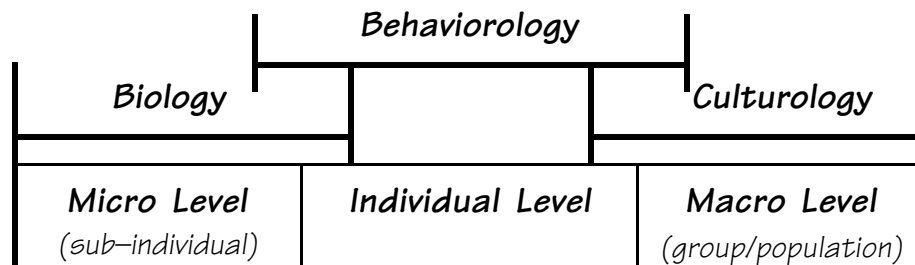


Figure 1. Disciplinary coverage for the three main levels of analysis in the life sciences.

Biology provides essentially a micro or sub-individual analysis of life, while culturology provides a macro or supra-individual analysis. Between them behaviorology provides an analysis chiefly focused on the environment/behavior relations of individuals within each individual's lifetime. Behaviorology takes into account relevant determinants from (a) the biological history of the species, (b) the behavioral history of a given individual, (c) the current physiological state of the given individual, and (d) the current environmental context, including cultural factors that might share in the control of the individual's behavior. Behaviorology is thus the study of all behavior-controlling functional relations between the environment and the organism, *as both environment and organism change*. Figure 1 illustrates these disciplinary relations. (The study of ecosystems, species evolution, and the behavior of animals in groups by some animal bi-

ologists implies that a disciplinary overlap also exists between biology and culturology. So Figure 1 might be redrawn as a triangle with extended sides that cross each other. Each side would represent one of these domains and its associated discipline. The areas where the lines cross would then represent the overlap in the interests of the intersecting disciplines.)

Individual and Group Levels of Analysis

The disciplinary boundaries presented here remain somewhat flexible. The discreteness of any discipline is generally recognized in proportion to the quality of the products produced by its members. Valid disciplinary identity exists, not due to special sanctions or protections guaranteed by political, legal, or economic contrivances, but because others, acting upon the scientific foundations of alternative disciplines, cannot do the job better. The disciplinary regions mapped here are not construed as territorial claims staked or recognized. They are merely domains of phenomena, available for scientific study, with respect to which adequacy in scientific address has been demonstrated by the mentioned groups.

The play of this qualitative principle can be seen in the overlap between behaviorology and culturology. Consider the following example (Hayes, 1988a) which clarifies the difference between the behavior of individuals and a maintained cultural practice. Referring to the strikingly repulsive jokes that most everyone hears being passed among people, Hayes invited the reader to suppose

...that a situation emerges in which joke telling is expected. You may find to your dismay that the only joke you remember is one of these disgusting jokes. You may repeat it. Noting the reaction, you may never say it again. In the meantime, however, you have infected your audience with this terrible joke. They may go through the same cycle. Thus, we may have a wave of horrible jokes swiftly propagated across the country, even though this behavior may fail to be maintained, even for a short while, in each individual engaging in the practice. (p. 16)

The two levels of analysis are evident: At one level the behavior of an individual can be analyzed with respect to (a) why that person exhibited that behavior, (b) at what rate and to what end the behavior occurred to that individual, and (c) the fate of that behavior in the repertoire of that individual. Alternatively, the *cultural practice of repulsive joke telling* can be analyzed separately at a different level of analysis. Note, for example, that the joke telling, as a cultural practice, can continue (a) beyond the tenure of that particular kind of verbal behavior in the repertoire of any one individual and (b) beyond even the lifetime of any one of its mediating individuals. The strength of a cultural practice also differs from the strength of the contributory behavior of any individual participant, and it is measured in different ways.

Those who study cultural practices at the descriptive level chart their spread among the members of a culture, measure their strengths, and record their durations. And they can, of course, do all of those things without concern about the specific controls on the behavior of the individuals who had roles in mediating those practices. With that implied division of scientific labor, behaviorologists and culturologists can work concurrently and maintain differentiated disciplinary identities.

However, when objectives advance from the levels of *description and prediction* to the level of *control*, scientists concerned with culture must then design and develop new

cultures (or change existing ones) by producing practices not yet occurring. Throughout the history of their discipline, culturologists have traditionally eschewed intervention. Mainly, they have identified, described, analyzed, and traced. And they have produced some accurate predictions. But the production of new cultural behavior requires control over the behavior of the individuals who contribute to the cultural practices of concern. At that level of operation, the disciplinary distinctions can become blurred, because culturologists would need the intervention capabilities of behaviorology. (Fralely [1988c] elaborated on this point and pursued the disciplinary implications.)

Operating at the level of *control* represents a much more recent trend in culturology. Circumstances increasingly impose this trend in spite of traditional disciplinary ethics that oppose intervention. With respect to method, contingencies of reinforcement can be imposed simultaneously on all members of a group so that the individual responses occur concurrently and yield group effects. Something like this might be approximated by universally applied food rationing. Another class of group effects results when a given kind of contingency successively impinges on different individuals at different times. The illusion of motion known as the “wave,” which spectators at American football games sometimes generate in stadiums, is an example. The previous joke-telling example also represents a variation in this class of effects.

Not only is a predictive science of *group-produced* effects (as opposed to a science of individually produced effects) possible, but so is a *controlling* science. Such a science has to some extent developed in support of the activities of anthropologists and sociologists, and it could develop further. Although group effects are necessarily produced by the summation of the behavior of individuals, a science of group effects *can* support intervention technologies in which the analytical repertoire of the cultural engineers does *not* penetrate to the level of individuals. For instance, composers and conductors can reliably produce prescribed group effects without knowing the details of how any particular orchestra member plays his or her instrument. That is because the audience-appreciated properties of the group effect are characteristics of the combined products or activities of the behaving performers. The contributing individual producers of that group effect are not each producing a small one-person version of the group effect appreciated by the audience. What an individual contributes is different—often extremely so—from the appreciated group effect.

The orchestra example, which is typical, shows how one cannot pursue the ontological status, or reality, of the behavioral group effect *intact* back to its stimulus-controlled behavioral origins. Similarly, you can try to approach a distant Olympic flag generated by a stadium section of card holders. But you ultimately arrive at any one of many persons each holding up a colored piece of cardboard. The flag, which is so clearly perceived from afar, can no longer be detected; a person holding a colored square does not evoke a flag-seeing response by an observer. Yet, the level of the behavior of those individual card holders is the only level at which interventions pertinent to the group effect can be *functionally* effective. Only when intervention attempts, intended to alter the properties of the flag-seeing response in remote observers, reach down to affect the behavior of all or some of the card holders can those group level interventions possibly work (e.g., card-change cues *producing* a change of cards that together shows a different flag). Insofar as any group behavioral intervention must have its ultimate effect on the behavior of those individuals whose combined activities yield the group effect, any capacity for intervention (i.e., control) that develops at the group

level of analysis must functionally reach for its effect to a control over the behavior of individuals—a behavior technology province well-worked by behaviorologists.

In producing effects at the group level, behavior engineers must arrange to evoke the behavior of many individuals. But in many cases they give little attention to the resulting behavior of *particular individuals*. Instead, they attend to the resulting group effect, and deliver stimuli and consequences in a blanket fashion. Group level engineers, whether conductors, economists, parliamentarians, social revolutionaries, or general culturologists, can impose adjustments that yield changes at the group level. And, as has been illustrated, they can do so while treating the whole analytical level of the affected individuals as a scientific “black box.” Culturologists thus do not have to be behaviorologists to operate at the scientific level of control from the perspective of their group level of analysis. Yet that level of intervention lacks the sensitivity for fine-tuning the group effect, which requires changes to the behavior of *specific individuals*.

Behavior scientists have long recognized that efforts to affect the behavior of groups are more successful when informed by an understanding of just how and why *individuals* behave under the imposed arrangements (see Skinner, 1953, Ch. 19). With that additional capacity at the behaviorological level, culturologists can fine-tune their engineering. They can trace many of the breakdowns or circumventions of group-level interventions to anomalies at the individual level as, for example, when a single card holder in the stadium raises a card of the wrong color. And then they can deal with those anomalies. If intervention technologies were limited only to group-level controls, imagine the plight of a social engineer whose plan for large scale waste management does not work well because one waste hauler, in spite of the engineered policies, regulations, and social ethics—all manipulated at the group level—is cutting costs by dumping his individual loads into a river from a remote bridge, loads so toxic that they nullify the whole engineering effort. That hypothetical cultural engineer, unenlightened as to the workings of events at the individual level, would not know in a technical sense how or why such anomalous dumping could occur. So he or she would not be able to down-focus the engineering effort to the individual level to fix that specific fault which is degrading the desired group effect. A culturologist, if really skilled *only* at group level engineering, could only continue to impose blanket contingencies in the hope that potentially errant individuals will share an appropriate response with others to at least some of those contingencies. Obviously, good cultural engineering requires skills at both the individual and group levels of analysis. And those responsible for cultural engineering must be prepared to operate, or cooperate, across the combined range of those levels of analysis as situations demand.

In the meantime, those behaviorologists who are additionally concerned with the engineering of cultural practices focus on controlling the behavior of the individuals whose behavior contributes to cultural practices. The behaviorological literature is rich in basic material applicable to that sort of science, for example, *Walden Two* (Skinner, 1948), and the culture-related chapters in *Science and Human Behavior* (Skinner, 1953) and *Beyond Freedom and Dignity* (Skinner, 1971). The Los Horcones community in Mexico has long provided a living laboratory. Ledoux (1985) has addressed some concerns of experimental communities. And Beach (1988), in an article suggesting that the design, construction, and operation of experimental communities might be called “sociocultural systems engineering,” provides a sample of the type of disciplinary blend-

ing endorsed above. (The relevance of this blending, for culture design in space settlements, was addressed in the previous chapter.)

A Niche in the Cultural Marketplace

The technological advances, especially of the past century, have left a disturbing discrepancy between the technical capacity to affect the environment and the control over the behavior with which people would do so (for typical examples see Fraley, 1981, 1987; Lamal, 1986; Skinner, 1987a, Section 1; Skinner, 1989b). For decades numerous and diverse fields, seeking basic scientific help in closing that gap, have turned to psychology and continually found its mainstream lacking in the technical foundations capable of supporting their work. As Skinner (1987b) put it, “unable to offer a useful conception of its subject matter, psychology has not formed good relations with other sciences” (p. 785). Most of those fields now ignore psychology. For example, the 1990–1992 *Graduate Catalog* at the University of West Virginia revealed that, outside of psychology–operated graduate programs, fewer than one in five behavior–related graduate programs required any coursework in psychology subject matters. One unfortunate effect of that otherwise rational disregard has been the neglect of the work of Skinner and his colleagues which, having been lumped indiscriminately with the rest of psychology, has undeservedly shared the neglect.

Yet dozens of non–psychology fields exist that are essentially applied behavioral areas if one considers their announced cultural missions and the behavior–related skills implicit in their training objectives. The early behaviorologists saw great potential for the cultural impact of their discipline in precisely these areas. These fields—many listed here with selected references to related articles or books, often authored from the behaviorological perspective—include advertising, applied anthropology (see Glenn, 1988; Harris, 1979; Lloyd, 1985; Malott, 1988; and E.A. Vargas, 1985), architecture, criminal justice (Fraley, 1988a, 1988b), economics, education (e.g., Barrett, 1991; Holland, 1960, 1967; Johnson & Layng, 1992; Keller, 1968; Skinner, 1968; E.A. Vargas, 1996; J. Vargas, 1977, 1988; West & Hamerlynck, 1992), environmental studies and ecology, ethics (Krapfl & Vargas, 1977; E.A. Vargas, 1975, 1982), entertainment, ethology, gerontology (Skinner & Vaughan, 1983), history, human factors engineering, industrial and labor relations, journalism, law (Fraley, 1981, 1983), management (Daniels, 1989), nursing (and other health related fields, e.g., pediatrics [Christophersen, 1988; Stewart & J. Vargas, 1990]), occupational health and safety engineering, organizational restructuring (Vargas & Fraley, 1976), peace studies, philosophy (Chiesa, 1994), physical education/sports/leisure studies, political economics, political science, public administration, religious studies (Burhoe, 1981; Schoenfeld, 1993), social activism (Ulman, 1983, 1986), social work (Thyer, 1987) and all its sub–fields such as substance abuse and rehabilitation, sociology, urban studies, women’s studies, and others. Whether they face problems that require a revolution or a band–aid, practitioners in all of these fields would find the principles of behaviorology not merely relevant to their work but, in most cases, the essential scientific foundation for timely achievement of their behavior–related purposes.

The behaviorologists generally agreed that behavior–related fields were scientifically adrift with respect to foundation behavioral science. They also thought that their movement would benefit these fields by avoiding the legacy of a discipline that most of these fields had rationally rejected. Scientific integration with these fields seemed

more facilitated by an independent behaviorology displaying its own academic, scientific, and professional integrity.

Belief and Intolerance in America

Though its name helps, accurate public perceptions of behaviorology developed slowly. Daniel Bjork, a scholar of cultural and intellectual movements, has hypothesized from a historian's perspective about the reflexive rejection of many behaviorological concepts within American culture (letter to Fraley, 14 February 1989). Speculating about why Proctor and Weeks (1988) called behaviorology an anachronism, Bjork posited that "eclectics have won out over the true believers throughout American history and have dominated our cultural scene since at least the early nineteenth century." Bjork elaborated as follows:

Belief and intolerance have been historically associated in America with the Old World. Mainline psychology, like mainline American culture, sells eclecticism and tolerance.... There is also a long history of mainline American culture dismantling or simply smashing any group or individual who believed to the point of intolerance. Witness the fate of the Puritans. Behaviorologists, if I read them correctly, are by their very scientific beliefs intolerant of the lingering mentalism in psychology.

The parallel, of course, is with any natural science. Behaviorologists' scientific beliefs make them intolerant of mentalism just as, for instance, modern astronomers' scientific beliefs make them intolerant of astrology, physicists of mysticism, biologists of creationism, and so forth. Bjork continues:

Mainline psychologists, reflecting the values of the larger American culture, simply have no tradition of belief. And when they meet real belief in behaviorologists they do the "American" thing and attempt to discount or eliminate it.

Eclecticism is especially American. The separation of behaviorology as a separate discipline is perceived not simply as non-academic and anti-intellectual, but as un-American...because it refuses to tolerate eclecticism as the base for the discipline. Behaviorology is dismissed as an Old World Cult—an anachronism more fitting in the Jesuit world of the late Middle Ages.

When you embrace eclecticism, you dismiss disciplinary purity. Behaviorology becomes a contemporary reminder of Old World fanaticism.

Bjork also saw the behaviorology movement confronting an American public that was biased against many behaviorological concepts perhaps as part of a widespread disdain for the natural sciences in America. (Nevertheless, Americans are strongly attached to the *products* of the natural sciences. Having referred to America's current stage between theocracy and sociocracy as "vacillocracy," Beach [1991c] mentioned that the motto America actually follows at present could be stated as "In God we trust, but on Science we depend." Such a motto portends deficiencies in science support; see Sagan, 1995, about the dangers of those deficiencies.) The efforts of behaviorologists to protect and maintain the integrity of their disciplinary verbal community, so necessary to good science, thus accidentally precipitated some rejection. (Behaviorologists were not alone in experiencing such rejection; see Ratner's discussion of the earlier efforts to reject Darwin and evolution from biological science [Ratner, 1936/1984].)

Bjork's analysis also suggests why non-behaviorologists easily exploit the public to arouse disapproval of behaviorology while relevant issues such as scientific validity and

effectiveness go ignored. Earlier sections of this work have provided several examples of language implying that behaviorologists exhibit this “un-American” intolerance and disrespect for the supposed virtues of eclecticism: Epstein’s disapproval of allegiance to an “unattractive credo,” Burns’s accusation about “rejectionism,” Proctor and Weeks’s reference to the “arrogance” and “scientific elitism” of behaviorists, the theme of Wendt’s assault on Keller’s program at Columbia University, and Krantz’s attribution of “conceptual imperialism” to behaviorists. One anonymous reviewer of a draft of this work claimed that behaviorologists have behaved in an “anti-intellectual fashion” that is “not academically defensible.” Aside from the question of validity in these accusations, any of these sentiments, cast as culturally protective admonitions, function as general anti-science weapons. This was especially so when these weapons were aimed at an emerging natural science discipline in a culture (a) much preoccupied with metaphysical alternatives that distract many of its members from issues that affect them, and (b) much infatuated with the popular pseudo-sciences that entertain them (Sagan, 1995).

A modern scientific discipline is a rare and elaborate verbal product requiring a long, careful, and invariably difficult course of development. It remains subject to easy mutation by extraneous contingencies of many kinds. Such a discipline can be protected and further refined only with the help of a stringent intolerance for unproductive contingencies. “Belief” in the discipline is merely the strength of the control exerted by its elements over the behavior of its practitioners as they engage in technological behaviors to affect the environment (see Fraley, 1984, for an in-depth analysis of the concept of belief). Statements asserting belief are based upon facts of the reliability in those controlling relations. In simple terms, if one notices that one’s science works well and reliably to produce effective behavior in difficult situations, then one attains the state to which people refer as one’s strong *belief* in that science.

The application of modern experimental science to the old questions about behavior has essentially dissociated behaviorology from any philosophically mentalistic lineage. This has made feasible a new focus on the practical *control* of behavior. The resulting natural science discipline has severed the simplistic reliance on faith in piously proffered explanations and substituted the experimentally derived data base. A data base functions as a special kind of controlling environment in which modern behaviorologists have sought order and described relations. Applying those relations, behaviorologists have extrapolated to accurate predictions and developed technologies affording control. (Some suggest that natural scientists like behaviorologists, rather than abandoning faith, have transferred it to the data base.)

The important concepts of how to shape and maintain a scientific verbal community are themselves behaviorological products. Those science-protecting concepts, invidiously likened by critics to excessive displays of faith, are *not* continuously derived from the tradition of Middle Age fanatical ideologies. Like modern physics and other basic natural sciences, organized behaviorology is a verbal community whose members necessarily eschew eclectic compromises with alternative paradigms. That tradition, while respecting the ancient principle of avoiding alien influence, is of more modern resurgence among the scientific communities where it has been a necessary strategy to preserve natural science in cultures steeped in metaphysical indulgence. The behaviorology of the 1990s has as yet had insufficient history to overcome such cultural biases against it. Even Darwinian biology, after more than a century, has not entirely solved this problem.

The tradition of American tolerance coupled with the suppression of overzealous believing developed for sound practical reasons. The Old World systems of belief were based on religious and abstract philosophical epistemologies, largely divorced from reality, nature, and practicality. Strong believing of those kinds might have had therapeutic value in the lives of the believers, and probably furthered the economic and other personal interests of the purveyors of faith who contrived and maintained those belief systems. But such strong beliefs contributed nothing to the coherence and integrity of the new American cultural amalgam. On the contrary, they proved divisive. American cultural development, having to depend upon such ideologically diverse human resources as were available, required that *those* kinds of strong personal beliefs be socially punished until they no longer prevented critical culture-building cooperation.

Unfortunately, American culture has *indiscriminately* generalized this special suppressive facet of Americana to certain highly valuable belief systems of an entirely different type for which the American culture has great need. Those, of course, are disciplines based on epistemologies of natural science. Those repertoires *do* reflect reality; they *are* natural; and they *do* share in the control of technological behaviors yielding practical and much needed results. The products of *those* disciplines *support* the cultural integrity. The commitment and intolerance exhibited by behaviorologists, often mistakenly regarded as excessive, were simply the care necessary to develop and maintain any modern scientific verbal community. Physicists, chemists, and other natural science communities exhibit the same care.

One problem that raises public bias against behaviorological concepts, principles, and technologies is that these represent the latest products from the sciences which remove humans ever further from a seemingly preferable though false pedestal. Earlier findings had already shown, for example, that the Earth is not the center of the universe (Copernicus and Galileo), and that our bodies are products of the laws of nature (Darwin). Now behaviorological science shows that our very being, our behavior, is lawfully related to the ways nature works. A public that is comfortable with the opposite views sees these facts as threatening and moves against the supporting sciences.

Another problem is that behaviorology is not as yet fully discriminated as a modern science by a public that has little understanding of the nature of science, especially with respect to behavior. For the time being, that public sees behaviorology merely as another facet of a skeptically regarded tradition most saliently represented by psychology and psychiatry. As Bjork put it (letter to Fraley, 14 February 1989):

The American public perceives psychology as a strange amalgam of science, fad, and hocus-pocus. Its essence is mystery not fact.... At bottom, psychology may still be perceived as more religion than science.

Americans have never wasted much time on philosophical matters, and for the most part their eschewing of that whole domain has worked to their advantage. Ironically, in carrying that pattern to the excess of punishing defenders of behaviorological integrity, the American academic community suppresses the very discipline that is needed to understand, and gain more effective control of, philosophy in relation to both natural science and culture in general (see Fraley, 1990a). If the human species is to survive its interactions with its own environment, natural science and its philosophy must come to *characterize* the culture both to countercontrol abuses (e.g., see Gould, 1981) and to enhance further natural science advances. Progress remains limited as long

as the steps necessary to protect natural science are misconstrued as harmfully divisive aspects of the culture and are punished to suppression.

Behaviorologists expect, however, that if effective results can gradually have an increasing impact on cultural survival, the misperceptions will slowly change; the suppression will decrease, even end. More appreciation for natural science in general and behaviorology in particular will become common. Individual behavior, cultural practice improvement, self control, and cultural survival will all be enhanced by the intensifying development of the now emerged discipline of behaviorology.

Summary of Chapter Six

Behaviorology serves the culture as a basic natural science discipline that can productively inform the work of practitioners in a wide variety of behavior-related fields. Many of those fields have little reliance on other basic behavior disciplines, especially psychology, and represent a needy market for behaviorological foundations. The behaviorological level of analysis puts that discipline between biology, which features a more micro-level of analysis, and culturology, which features a more macro-level of analysis—although behaviorology overlaps both biology and culturology. The bias against behaviorology within American culture reflects both the age-old conflict between faith and reason and the more recent American tradition of punishing pockets of apparently excessive faith, in the interest of forging a cultural integrity out of ideologically disparate human resources. The culture cannot be saved without massive interventions based on the products of the natural sciences—and most needed are the contributions of the natural science of behaviorology.

This chapter, Chapter Six, was the last of the five main parts of this account of the emergence of behaviorology. It accompanies Chapter Seven which provides a brief conclusion to this account and which is followed by endnotes and references. ❀