

Editor's Concern

Please note that there has been some risk for our readers involved in presenting these various parts of Lawrence Fraley's "Person, Life, and Culture" chapter of his *General Behaviorology* book (Fraley, 2008) in the venue of this journal (e.g., the two parts of "Natural Science, superstition, and Academic Institutions" of which part one begins after this note). The reason the "Person, Life, and Culture" chapter is a "later" chapter of the book (i.e., Chapter 28 of 30 chapters) is that covering the content of Chapters 1 through 27 most likely is needed to respond fully to this material. To the extent that this is true, the opportunity to respond appropriately may be diminished, and hence the concern about risk for our readers.

Can you report that your prior conditioning history (especially regarding what the natural science of behaviorology is all about, etc.) has fully resulted in your being up to this task? You may find it helpful to contact the editor or the author with questions or comments either way, before or after reading further.✻

References

Fraley, L.E. (2008). *General Behaviorology: The Natural Science of Human Behavior*. Canton, NY: ABCs.✻

Natural Science, Superstition, & Academic Institutions Part I (of II)

Lawrence E. Fraley

West Virginia University

[This is part I of another topical excerpt from "Person, Life, and Culture," a later chapter of the author's book, *General Behaviorology: The Natural Science of Human Behavior* (Fraley, 2008). Given its relevance to improvements in cultural concerns, readers of this journal may find it pertinent. The second part is presented in the Spring 2009 issue (Volume 12, Number 1).—Ed.]

Recourse to a superstitious account for an important event leads to a plethora of related pseudo-explanations as the implications of that basic fallacy continue to compound, often under community pressure for elaboration.

However, those kinds of invalid accounts, in contests of efficacy with natural science accountings, have ultimately fallen short of equal practical worth.

Scientific Behavior versus Superstitious Behavior

Within human culture, practical matters are typically well purged of control by superstitious verbal behavior even when the involved parties are heavily invested in certain other forms or patterns of superstition.¹ To argue persuasively that superstition and natural science represent equally worthy branches of intellectual activity poses an arduous challenge when the arguments pertain to specific instances that involve real variables. The inherent inequality in effectiveness of those approaches suggests that scientific and superstitious behavior should never be presented to students as if they represent equally worthwhile intellectual options.

The preceding argument pertains to the thematic objectivity of the kinds of intellectual activity that are being compared. On the other hand, superstitious behavior may win contests of efficacy when the objective is to foster superstition per se. For instance, consider a person whose well-being is based on financial support contributed by followers who believe that they are paying for contact with one who has special access to an appealing but mysterious and powerful supernatural realm. If the richness of that personal economy is to be maintained, that person must promote that belief among the general populace. In most cases that promotion is most effective

¹ For example, suppose that the High Priestess is on her way to perform an important mystical ritual at the Temple of Ogillian, the God of All Things. The ritual is in behalf of followers whose parched crops need rain. Suppose, too, that her trip is curtailed when the engine of her automobile begins to make odd noises, loses power, and abruptly comes to a stop in a cloud of exuded blue smoke. She can have her car towed either (a) to her own Temple of Ogillian where her ritualized prayer for rain can be modified to include a plea for divine repairs to her broken car engine, or (b) to the nearby garage of an automobile mechanic who is known for speedy repairs to failed engines. We predict that she will dispatch her car to the nearby garage, although she may accompany that action with what appear to be redundant appeals for the supplementary intervention of her favored deity. If she opts instead merely to leave her ailing car exclusively to the mercy of Ogillian whose help has been solicited through her ritualistic praying, we predict that her car will remain inoperable. Even members of her own sect, who routinely take their own broken cars to their favorite mechanics, may chide her too fervent expectation of a miraculous car repair at the temple altar.

when that person personally displays, models, and endorses extensive indulgences in the appropriate kinds of superstitious behavior. With respect to the prevailing economic contingencies, that person's own belief in the theme of that activity is but a sometimes helpful although theoretically unnecessary artifact.

A career that is supported by the promotion of superstition may be pursued independently by an individual. However, such practitioners often band together and organize in ways that more strongly imply the propriety and necessity of their proffered kind of approach to whatever awesome and mysterious power they claim to represent. Being part of such an organizational structure tends to be more convincing to the contributors and hence increases both the reliability and the quantity of their various kinds of supportive contributions.

Where a scientific alternative to a superstitious account is not available, it would be incorrect to assume that no scientific accounting can be produced, although that has often been argued as a way of justifying the promulgation of as yet unchallenged superstition. In the traditional absence of a well established natural science of behavior, that kind of argument has often been advanced vigorously with respect to certain behavior-related phenomena. For instance, proponents of superstition have often insisted that no scientific approach could ever yield an adequate and coherent accounting for something as complex and awesome as a human being and its behavior, especially its private verbal and other neural behaviors. They typically misconstrue private neural behavior, treating it as though it represents the proactive initiatives of a miraculous machine called a *mind* and describing what is natural reactive neural behavior as *willful cognition*. However, the entirety of human behavior is precisely the subject matter of the natural science of behaviorology, and the kinds of behavioral phenomena that define a human being are no more intellectually impenetrable to behaviorologists than are the intricacies of molecules to physicists and chemists.

From both scientific and historical perspectives, explanatory and prescriptive recourse to superstition is a somewhat primitive and less intellectually mature approach than is reliance on theoretically measurable evidence in a manner that is informed by a philosophy of scientific naturalism. In the course of the evolution of the human intellect, recourse to superstitious verbal behavior predates recourse to objectively informed verbal behavior. However, regardless of that historical lead, for every outcome that would benefit human welfare, superstition-based efforts to attain it can be supplanted by scientific approaches. Not only is that possible, but case by case, the lessons of history have demonstrated the practical advantages of the scientific approach.

However, in many pending contests between scientific and superstitious approaches, the particular kind of science that is needed to complete such a demonstration is the natural science of *human behavior*. Its historical absence from the roundtable of the more established natural sciences has allowed the organized proponents of superstition within the culture to argue, often with seeming verisimilitude, that many stubborn behavior-related problems that plague humanity are soluble only through a surrender to the prescriptions of organized superstition. That contention is similar to those that prevailed with respect to other classes of natural phenomena during the historical era that preceded modern physics, chemistry, and biology.

Cultural Implications of the Absence of a Natural Science of Behavior

The extensive contemporary cultural investment in superstition is of vast proportion. Various kinds of organizations, formed to defend and promote superstitious ideologies, now enforce behavioral conformity with those assumptions in both formal and informal ways. Typically, the often informal enforcement is so effectively imposed that personal acquiescence to those demands has become a general criterion for the worthiness of a person within our culture. For example, currently, potential public leaders from the local to the national, in general, must demonstrate a requisite susceptibility to religious superstition to rise to viable candidacy for elective office. More formally, conformity to the assumption that operant behavior is driven by a responsible self-agent is a foundation of the legal system, and that assumption is evoked in behalf of law enforcement.

Nevertheless, compelling counter-arguments suggest that behaving in ways that serve the best practical interests of one's self, one's community, and one's culture never requires personal recourse to superstitious methods of analysis. In a given person's case, an efficacious alternative to superstition may require behavioral conditioning that has not yet occurred, a deficiency often described in general terms as "the need for a more appropriate education." If the general population were as well schooled in the natural science of human behavior as it is in the rudiments of physics, chemistry, and biology, people would be much less prone to the general assumption that superstitious behavior is necessary to human well being. At least in far fewer specific cases would it seem so.

Before a natural science of human behavior can have its cultural effect on a scale comparable to that of the other basic natural sciences, it must be divorced conceptually and organizationally from the existing social sciences, which are well rooted in fundamentally superstitious assumptions about the nature of human beings and their behavior. According to many such assumptions, the es-

sence of a human being resides in a spiritual entity, whether the secular self or a religiously invested body-dwelling ethereality, with all or part of a person's behavior reflecting the will of that somewhat autonomous and quite mysterious manager of behavior.

As people become more educated with respect to the potentially adverse implications of superstition per se, and as they are introduced to the advantages of its more objective alternatives, they may rather readily cease exhibiting salient forms of superstition. For instance, they may abandon blatantly superstitious forms of religion and follow a more secular course. However, even a firm private or public commitment to secularism does not necessarily immunize one from superstition. Many people whose intellectual posture may be regarded as quite secular, nevertheless exhibit an explanatory reliance on a proactive self that initiatively designs and then willfully directs the behavior that the body then executes.

Furthermore, because their doing so is fashionable, common, and generally anticipated, they often do so without recognizing the superstitious nature of their own perspective on behavior. To accept uncritically that a person can "make a decision" or "choose a course of action" is usually to accept the implicit notion of an internal agent that can perform such impossible feats of initiation and which can then be held responsible for the implications of having done so. Attention that is focused on the unreal qualities of the presumed but actually nonexistent self-agent is attention diverted from the real contingencies under which the behavior of concern manifests inevitably.²

² Consider two options: (a) to alter the contingencies under which certain undesirable patterns of behavior occur and (b) to blame a putative agent for the bad outcomes of the behavior that it has chosen. Note that (a) and (b) are informed by two entirely different kinds of assumptions about the fundamental nature of human behavior. As revealed in the more detailed analyses presented in earlier chapters, option (a) pertains to the manipulation of real and relevant variables and can be pursued to practical outcomes via a scientifically established behavioral technology. In contrast, option (b) is cast in terms of unreal variables so that one is left with no implications for direct practical intervention. Under option (b) what one supposes that one is doing is largely nonsense, but some of what may be done presumably to "persuade or compel an errant self-agent to mend its ways"—practices that have been selectively conditioned over long periods of time by their practical outcomes—may prove more or less effective, not because they have influenced a bad self-agent to start making better choices, but because those practices have, for what remain largely unknown reasons, had beneficial effects on the variables in the prevailing

In earlier sections of this book we have noted that people are often rendered superstitious merely by thinking and speaking in the normal linguistic manner that is taught within their culture. Human linguistic practices have evolved within the behavioral repertoire of a species that, historically, has reacted to its own behavior from a predominantly superstitious perspective, and that superstitious perspective is now widely reflected in the syntax of contemporary human languages. The active form of verbs provide a salient kind of example (i.e., a person *does* something). Thus, the proper manner of speaking casts the person as an implicitly proactive initiator and doer of the specified action.

For instance, if you simply report that "each morning, Ms. Jones *runs* to the bus stop," then absent some behaviorological counterconditioning, members of the audience tend to infer that the person-agent that is assumed to inhabit the body of Ms. Jones (i.e., the implicit *she*) is somehow the proactive initiator of that running behavior. That is, the *she* within her body *does* it in the sense of making it occur discretionarily. Few contemporary listeners infer from that statement that the running merely happened inevitably to her body as a result of functional antecedent control having been acquired through an energy transfer from some natural variables in her environment.

Regardless of the presumed autonomy of the self-agent, some presumed role for the environment is usually acknowledged insofar as the relevant aspects of the environment are allowedly considered or somehow taken into account by the mystical self-agent. After having accepted some measure of environmental influence, the self is thought to *decide* what is then to be done and to issue the orders for the ensuing behavior that the body is subsequently observed to execute. In so doing, that implicit self-agent presumably becomes *responsible for* that behavior and for its practical implications.³

contingencies that are determining the behavior of concern. However, bad mistakes can and often do result when the interventional practices are crafted in stricter conformity with the invalid ideology than to their resultant consequences—that is, when practicality is sacrificed in stringent respect of invalid ideology.

³ A language need not have a syntax that reflects mysticism. That is merely an artifact of historical linguistic development within the universally superstitious cultures of this planet. Thus, existing languages, such as the English in which this text is written, are endowed with such properties. That makes difficult the writing of a text such as this one, which is thematically antithetical to the inherent superstitious implications that are intrinsic to the only practical medium that is available for its textual expression.

Too often, in the established social sciences, scientific practice pertains only to the pursuit of the implications of the common but fundamentally mystical basic assumptions about behavior. Those superstitious basic assumptions themselves go unchallenged. Absent the quality-controlling effects of natural philosophy and the products of the science of behaviorology, the scientific practices of most who are called *social scientists* adjust as necessary to avoid outcomes that would require interpretations challenging the basic mystical assumptions that often underlie their professional activities.

Some Cultural Implications of Traditional Social Science

The behaviorological kind of analysis by which functional relations between behavior and environment are discovered has tended to be aborted midway by most followers of the traditional socio-behavioral disciplines. While they too begin with observed behavior, they have tended to assume, often uncritically, the existence of an internal proactive self-agent, and their trace of natural antecedent events often stops there. They are then left with the task of analyzing that mystical self-agent. Their investigations may become scientific with respect to the methods by which they probe what they assume to be the nature and behavior-related implications of that basically mystical construct as well as its various facets considered separately.

In addition to the traditional social science fields, such assumptions typically compose the foundations that inform the kind of interpretative activity prevailing in other behavior-related fields such as communications, linguistics, political science, and law. The legal system is predicated on the assumption of the responsible self. The methods that are prescribed for dealing legally with intolerable behavior, while typically relevant to practical contingencies, are kept respectful of the superstitious notion of a responsible self that can exercise some bad discretion. Corrective stimuli delivered to the body are presumed somehow to bridge the gap between the corporal and ethereal realms and thus reach and affect the spiritual self-agent.

Such a bad self, if it remains unaffected both by persuasive external displays and by aversive assaults upon the host body, tends to be regarded as intrinsically evil. Keeping the host body confined in a cage presumably precludes most or all of the adverse implications of any continuing bad behavior that the evil self may prescribe. Alternatively killing the host body presumably deprives the evil self of the behavioral means by which to mediate its bad intentions. Whether the evil self is presumed to share termination of vitality with the body or is presumed to escape the dying body via some sort of ethereal departure is largely irrelevant within the criminal justice system.

In attempting to account for behavior through an explanatory reliance on an impossible proactive capability, those who believe in behavior-controlling selves tend to ignore the functional chaining of events that leads back to the independent environmental variables—variables that denote potential points of technological intervention. Instead, the scientific activity consists of attempts to reveal any real characteristics of whatever marvelous intrinsic entity can presumably accomplish miraculous acts of spontaneous initiation (in this case, of behavior).

To aid in unraveling the mysteries of the mystical “mind” (as proponents usually refer either to that agent or to its putative dwelling place) contemporary social scientists have often enlisted the help of brain scientists. As noted throughout this book, internal neural activity is always associated with observed behavior. While brain scientists are usually natural scientists whose specialty is a branch of physiology, they have in some cases practiced good physiological science in service to the forces of organized superstition. That occurs when brain scientists interpret and publicize their valid physiological results as if those results pertain to the corporeal aspects of some mental activity of the kind that self-agents presumably initiate. Such findings may be relevant to some of the behavior-mediating operations of the nervous system, but with the carefully qualified exception of structures such as the sinoatrial node, nervous systems have no spontaneous initiatory capacity with respect to behavior.⁴

An example may occur when brain scientists explore the neural activity that is occurring while a person “makes a decision.” If they then report their physiological findings carelessly in terms of “what one’s brain is doing when the person is deciding an issue,” those findings are widely subject to interpretation as corroborating the existence of agential selves.

Among those who are entertaining that misinterpretation may be some of those brain scientists themselves. In other cases, those scientists may simply be reporting their findings in terms of common agential assumptions in an effort to be understood within the general public, at least at some level. Thus, misinterpretations of the findings that are produced by natural scientists do not necessarily imply that those natural scientists also subscribe to those misinterpretations of their own findings. Still, the reporting of valid physiological findings in lan-

⁴ A sinoatrial node is sometimes cited as an exception insofar as it seems to generate the periodic electric impulses that in turn stimulate regular heart beats. In that case the incoming energy from the environment may arrive nutritionally rather than as a direct nervous transmission, but the output of regular electrical impulses remains an inevitable product of energy-affected structure, and, as in all natural processes, spontaneity is not involved.

guage that panders to such common superstition, whether (a) mistakenly presumed valid, (b) dismissed as a harmless irrelevance, or (c) carefully crafted as a tactical deception, may buy some personal accommodation. However, that kind of accommodation comes at the expense of another natural science field (specifically, the natural science of behavior) and thus erodes the integrity of the natural science community as a whole.

In nature, as natural scientists define it, there are no spontaneous beginnings. Natural events chain functionally back through the time that they have shared in defining. The linkages consist of energy transmissions. The continuity of that chain of historical functions is not only presumed to extend backward from the present but presumably will establish forward as well—an unbroken chain of function, the links of which may be said to be converted from potential to real upon their overtake by the advancing present.

The realm of nature is assumed to retain its definitive functional characteristics beyond the limited range about which we can render accurate descriptions at any given time. That assumption is derived inductively from the history of formal scientific activity and from practical objective experience in general, and it is critical in maintaining the general contingency to persist in scientific pursuits—activity that may then correct our accounts and extend the range of our descriptions of function. We bother to explicate nature through the pursuit of scientific activity, because we assume that function is always the only way by which things can happen and thus exists to be discovered as the underlying cause of any encountered event. And in that regard nature in general, though often challenging, has not been disappointing.

In contrast with a natural sequence of events, which includes no spontaneous origins, a traditional social science account would perhaps posit an interruption of that functional continuity with the imposition of a spontaneous origin. A typical example occurs during the account of a behavioral event when its initiation is attributed to a *person* (in the sense of implicit self-agent). In deviating in that way from the tenets of naturalism, analytical attention that should be focused on the *functional environmental antecedents* of the behavior of concern is kept focused on whatever fictitious body-inhabiting constructs have been invented to provide an unnatural intrinsic causal origin for such behavior. During investigations of behavioral phenomena by those who rely on such unnatural contrivances, attention tends to be fixated on the nervous system, the body part in which such important but fictitious behavioral initiatives supposedly arise.

Typically, from that perspective, the body of a person is operated by some kind of mini-person (the self-agent) that dwells within the nervous system of the outer person. It may be thought to have an entirely corporeal na-

ture, but instead in most cases it is regarded as an ethereal or spiritual entity. In common practice, attention is focused more on what are believed to be the proactive behavioral accomplishments of that agent than on how such an agential self could operate. If contingencies arise that compel explanatory attention to that self-agent per se, a common result is recourse to a still more powerful fictional agent that, in turn, may be said to install and manage body-dwelling self-agents from an ill-defined but usually remote external location. A spiritual bureaucracy may be conceptualized that features lesser and greater Gods or a single God who is served by a subordinate class of spirits. One common version features a hierarchy of variously ranked angels in service to a single deity that serves as a kind of chief operating officer. The usual practice of conveniently endowing a paramount super-agent with omnipotence terminates the tendency to extend the accounting indefinitely by conceptually extending the sequence of ever more powerful creators and overseers, each of which is deemed responsible for the existence and oversight of the preceding one.⁵

When human behavior is studied in the traditional social sciences, the preoccupation with the putatively responsible self can diminish the importance of outwardly exhibited behavior. With analytical attention directed toward the putative behavior-initiating self, observable behavior is often studied mainly for its implications about the qualities of that presumed intrinsic agent. Presumably students are tested for evidence of what their internal agents have learned, with *learning* regarded as a vague process that enhances the behavioral archives to which a self-agent has recourse when designing a unit of activity that it will subsequently will the body to behave. Thus, with respect to what is of interest under the assumptions that have traditionally prevailed in the social sciences, observed behavior may be relegated to a class of indirect evidence. The nonexistent internal self-entity is mistakenly accepted as what is most impor-

⁵ Within the general human culture such super-agents are usually specified as deities. Within some subcultures the designation is “God” or “the Gods,” depending on whether one deity alone is assumed to do the whole job or whether a team of specialists is required. One popular subcultural variation of an individual’s agential self posits certain important classes of human behavior manifesting in accordance with the will of a resident self-agent but under the oversight of one or the other of a pair of remote super-agents that are known respectively as *God* and the *Devil*. In that case, one of those super-agents tends to be held responsible for a particular behavior according to whether that behavior comports with, or does not comport with, the values of those individuals who are rendering the attribution.

tant about a person, and regardless of its lack of being, it often becomes the focus of investigations and the ever elusive target of interventions.

Regardless of the substantial mislead that has often driven the activity within organized social science fields, social scientists have remained under academic contingencies to seem scientific or objective. Explicit references to mysterious behavior-generating selves have often been avoided by instead referring more vaguely to behavior-causing *traits*. However, such traits are invented and invoked with the same disregard of objectivity as are behavior motivating selves or spirits. In most contexts the attribution of a displayed behavior to (a) a given *trait* or (b) the will of a body-managing self or other spirit are interchangeable, because, whether the tact be *trait*, *self*, or *spirit*, the stimuli that evoke those respective tacts cannot be distinguished. And importantly, all of them are invalid independent variables that have been conjured to account for behavior while the real independent variables in the functional relations between environment and behavior have tended to go neglected.

The philosophical assumptions of scientists in general, and in this case of social scientists, necessarily affect their scientific activity in profound ways. Consider, for example, what social scientists purport to gain from their appeals to brain science. Just as the Austrian monk Johann Gregor Mendel assumed that his experiments with the genetics of peas were providing some further explication of how God performs the miracle of life, many social scientists presume that physiological brain science similarly provides some further explication of how a self-agent performs the miracle of behavior. Under such assumptions an ultimate misinterpretation of the physiological data is inevitable regardless of how objectively those physiological data have been produced.

Organizing Behaviorology for its Role as a Natural Science Alternative

Behaviorology and its various applied behavioral technologies afford a natural science alternative for the behavior-related studies in each of the traditional social science fields. In behaviorology, the proactive decision-making and hence responsible self of traditional psychology and other social sciences becomes the structural result of conditioning, which leaves the body susceptible to certain kinds of control by specific features of its environment. No personal agency is involved. With body and environment related by way of an appropriate kind of contact, function will thereby have been established via transmitted energy, and the dependent behavioral events are inevitable.

Behavior remains subject to intervention, but the target variables of practical intervention shift from the presumably definitive properties of a fictional agent to

aspects of body structure, aspects of environmental structure, and the energy-based functional relations of one to the other. The often subtle intricacies of complex, ongoing human behavior merely reflect the many variables that share, often transiently, in its antecedent control. That ever changing stream of antecedent stimuli, with the respective transient functionality of each constituent stimulus inconsistently overlapping the duration of others, yields the smooth integrity that characterizes well refined behavior.

Thus, an extensive behaviorological repertoire is usually required for the comfortable appreciation of an entirely natural account for the smooth integrity of complex behavior. Such refined behavior requires a shared control involving many concurrent functional relations, the nonuniform durations of which respectively start at different times with each overlapping others. Absent the scientific repertoire to appreciate such an elaborate account, it is hardly surprising that people resort to interventions by custom-designed spirits to restart their stalled explanations. Given the importance of behavior, it merits careful study from a valid perspective, and arguably the culture would be well served if an appropriate discipline for doing so were to become as securely installed in the curricula of the schools as are those for the study of energy, matter, and life functions.

The organizational and conceptual integrity of the discipline of behaviorology merits the same cultural protections that maintain the organizational integrity of physics, chemistry, and biology—and for similar reasons. The history of modern science suggests that any integral natural science discipline must be organized independently if it is to mature as a discipline and if its contribution to the culture that it serves is to be optimized.

Some natural scientists of human behavior do not endorse organizational independence for their discipline and instead propose to infiltrate predominantly superstitious social science communities in attempts to persuade the members of those communities to behave in less superstitious ways. Those social science communities are so well established within the culture that some natural scientists of behavior are convinced that those entrenched forces of organized superstition cannot be circumvented and instead must be changed from within. However, that approach often proves ineffective for natural scientists, because their way of persuasion is to demonstrate the superior qualities of practical outcomes that follow from science that is informed by the philosophy of naturalism. However, that represents a kind of evidentiary display that affects their superstitious counterparts only at the more superficial level of practical activity. Unfortunately, fundamentally superstitious people tend to interpret scientific practice and its outcomes in ways that comport with their

own philosophical assumptions, and they tend to adjust those practices as necessary to insure that compatibility.

Thus, good results produced by the natural scientists have little or no effect on the basic superstitious assumptions with which those outcomes are being interpreted by a superstitious audience. With their superstitious basic assumptions intact, those assumptions continue to share in the control of those peoples' scientific practices, even when they start to copy practices that have been displayed by the natural scientists. Those copied practices are then subject to drift, because the scientific quality-control afforded by a philosophy of naturalism is absent from the kind of quality-control that is exerted verbally via those peoples' superstitious philosophical fundamentals.

That is, if natural scientists seem to have a better procedure for attaining a particular practical outcome, a strongly superstitious person may adopt that practice in certain narrow or specific contexts, but that person's superstitious philosophy, through which the data pertaining to that practice are interpreted, will have gone unaffected. Demonstrations of scientific methods (procedures) that are of purportedly greater efficacy are interpreted in that regard according to philosophical criteria that remain immune to the outcomes of those methods.

Thus, the philosophy-based quality-controlling functions that keep practice optimally effective in natural science fields seldom appear along with the adopted science in the repertoire of deeply superstitious people. They have merely become persuaded to engage in certain scientifically derived procedures that yield effective results in certain practical situations. Absent the kind of philosophical repertoire that rationalizes and justifies adherence to those methods, across occasions on which those practices would be appropriate, those practices may nevertheless occur only intermittently, and they tend to remain narrowly applied. Also, without the quality-controlling philosophy, the copied practices are subject to seemingly harmless changes that may diminish their effectiveness. When the effectiveness of an unwittingly altered practice diminishes, that practice tends to be abandoned—an abandonment that is often accompanied by diminutional qualitative assessments that may generalize to the kind of natural science through which that now bungled practice originated.

For example, consider deeply superstitious people whose subsistence depends on agriculture in an arid climate. Suppose that irrigation is not feasible, and the agriculture depends on rainfall that is generally unreliable. Let us further suppose that the people routinely engage in elaborate dancing rituals meant to make a favorable impression on a deity that is superstitiously assumed to control the local rainfall. Suppose, however, that presentations made by meteorologists convincingly demonstrate to those people that, on the occasions of particular and discriminable local weather conditions, precise cloud

seeding is followed more reliably by rain than generally occurs following their traditional rituals. They may then forgo dancing and invest in an assortment of appropriate weather measuring instruments and a suitable aircraft along with quantities of the chemical substance that is used to seed appropriately pregnant clouds.

If their new practice then reliably yields more rain than their old ritualistic practices, *their conclusion may be that the god of rain is more pleased by offerings of that chemical substance than by the performances of the dancers.* Explanations of how raindrops form by water condensation on the dispersed chemical particles may even be accepted, with the interpretation being that that is how the rain god accomplishes the rain-making (when and if that god decides to bestow some rain on the parched lands of that tribe). Among those community members, the occasional cloud seeding failures, like failures of the former dancers, are attributed to their having evoked the rain god's disfavor or perhaps to the failure of their performances to bring their plight effectively to the attention of that god. The tribe may then abandon its offerings of the cloud seeding chemical as it had abandoned the ritualistic dancing, perhaps opting instead for something more attention grabbing.

For instance, the tribe may resort to aerial fireworks displays, which theoretically should better attract the deity's attention and may prove to be more pleasing than a mere dance or a dose of chemicals. Likewise, when social scientists maintain their assumption that the social behavior of individuals is dictated by the self-agent of those persons, they may unwittingly abandon or corrupt practices that are of some functional validity during their misguided theory-based efforts to appeal more influentially to those unreal intrinsic agents. That same kind of disrespectful fate can await a contribution from embedded natural scientists when they proffer a more effective practice, especially when the discipline from which that practice originated threatens the community's superstitious philosophical foundation by implicitly revealing its redundancy.

While the redundancy of the deity may eventually be recognized by some of the least superstitiously indoctrinated people, most community members will probably continue to interpret all relevant data in terms of their superstitious basic assumptions. The expulsion of the deity from any one operation threatens the presumed role of the deity in all operations. Thus, even when it seems to outsiders that the elimination of a role for the deity could occur without adverse implications, such a seemingly harmless conceptual displacement of the deity from a particular practical operation may be resisted tenaciously because of its far reaching implications for the place of that deity in other operations where it affords a comfortable explanatory option. Stubborn reaffirmation of faith in the

deity thus holds at bay the troublesome basic question—namely, if the deity is no longer regarded as essential in one operation where it was previously assumed to play a necessary role, is it really essential in other operations?

Recall the old kernel of scientific wisdom that says “when science advances, superstition retreats.” That is not always true, especially when the science and the superstition manifest in the behaviors of different people. In that case, the abandonment of superstition, with its lingering threat of generalization, may be greatly resisted. If in some cases the advance of science renders superstition entirely redundant, why not assume that that is going to be true in all similar cases? Faced with a threat of that scope, those who are invested in superstition tend to protect that investment by resisting the abandonment of superstition in any instance of scientific intrusion, even if powerful contingencies of practicality force them to adopt in some narrow way certain technical practices the prescriptions for which have been derived via naturalistically informed objective science.

Here we are considering two classes of people: (a) scientifically objective people who exhibit a naturalistic philosophy and (b) other people whose philosophy is rooted in superstition. In the course of their lives both types of people tend to become heavily invested in the implications of their respective way of thinking, and those various investments tend to become progressively less reversible as they become larger. That is, the well being of those whose basic assumptions support impractical actions may come to rely indirectly on their pursuit of the misguided implications of those invalid assumptions to the extent that they find themselves unable to contend with the adverse implications of coming to know better.

Harking back to the previous example, during a cloud seeding operation the role reserved for the rain god in controlling rainfall may get shifted to the operational periphery where it has little if any impact on the practical procedure of rainmaking. However, the revered deity remains conceptually extant. Defenses of that divine concept can have various implications, perhaps indirect, that may still intrude on the practice of cloud seeding. For instance, a pious devotee may advance the general argument that scientific probes of how the deity operates are both presumptuous and disrespectful, especially if those probes seem like human intrusions into the sacred operations by which the deity produces manifestations of its existence and power.⁶ It may then be argued that offending the deity by prying into its methods is not worth the small and perhaps temporary increases in rain that such intrusions may afford.

Deities have often been constructed conceptually to account for natural complexities by those who are unprepared to appreciate the awesome power of mechanical and selectional causal mechanisms. However, from our naturalistic perspective, unreal things presumably can play no functional role in any natural phenomenon, which includes the formation and fall of rain. When accounting for rain, that exclusion of unreal variables maintains the quality of scientific behavior by keeping the focus on real events during attempts to discover independent variables. That is, it is the philosophy of natural science that maintains the critical economy of effort whereby scientific activity is kept pertinent to measurable variables.

Within our culture the prevailing essential concept of a person will continue to overlap aspects of the mystical realm until the natural science of behavior becomes the predominant intellectual approach in people’s efforts to analyze human activity and to gain technological control of behavioral qualities. The theme of this section is how organizationally to best bring naturalism to that prominence.

People generally regard as desirable the educational production of ever more effective behavior. However, the forces of superstition are well organized, and within the culture they enjoy a near monopoly in controlling the practices by which new behaviorally defined persons are produced (i.e., conditioned). For example, teacher training programs are operated and administered almost exclusively by people whose professional activity is informed by traditional social science. Widespread change to a natural perspective at the philosophical and scientific levels would tend to result in some new and different instructional practices. The behavioral products of such instruction would be more effective to the extent that practices that are informed by natural science are more effective than practices that are informed by superstitious assumptions. Furthermore, the associated respondent conditioning would tend to insure that those new teaching methods and the behavioral repertoires that they produced would be accompanied by appropriately compatible emotional reactions.

Although teachers are putatively being trained to produce people who can behave effectively, very few teachers receive any instruction in the real nature of human beings and their behavior, so in terms of real functional variables, teachers seldom know precisely what they are trying to accomplish. Unable to define their general objective in terms of real variables, they remain unable to focus their methods. Members of the general public remain con-

who were conducting similar studies, his voluminous personal research notes were destroyed, reportedly because such detailed probes into the intricacies of God’s methods could seem sacrilegious.

⁶ When Johann Gregor Mendel died in 1884, although his previously published works on genetic theory survived in archival obscurity until discovered decades later by others

fused by the widespread failure of the schools to teach effectively. They clamor for a variety of peripheral and in some cases helpful but imprecise corrections such as longer school days or terms, better facilities, more equipment, smaller classes, curricular reshuffling, et cetera. Members of the general public, however, are ill-prepared to demand a purge of superstitious assumptions from teacher training programs when they share those assumptions.

In fair contests of efficacy, organized natural science has seldom if ever failed to prevail against the forces of organized superstition. However, before the natural science establishment can participate effectively in the contest to produce persons of the highest intellectual quality, it must, as they say, *get its act together*. Along with the independently organized natural sciences of energy, matter, and life functions, the natural science of human behavior must become independently organized as the natural science of behavior-environment functional relations. Such organizational independence implies an integrity that is defined in terms of professional organizations, academic departments for the training of its professional scientists and practitioners, a comprehensive literature, and an electronically mediated network linking its community members.

The presence of such an organized natural science discipline among the other basic natural sciences would enrich the natural science community as a whole, mainly by completing what heretofore has been characterized by a rather glaring gap in its disciplinary profile. The natural science community, in seeing to its own completion, can in various ways contribute to the establishment of organized behaviorology, which by taking its place at the roundtable of the natural sciences could render unnecessary that community's abandonment of nearly all important behavioral phenomena to the various agencies of organized superstition.

Both the scientific and philosophical practices of the entire natural science community manifest as dependent scientific behavioral variables in functional relations between (a) independent environmental variables and (b) the relevant behavior-capable body parts. At present the natural science community includes several organized natural science disciplines yet includes no well installed natural science field pertinent to the nature of human behavior, including the very scientific and philosophical behavior that endows the natural sciences with their special naturalistic integrity.⁷ Without the science of science

⁷ Recall that while biology-based science can provide a natural physiological account of *how* a behavioral response occurred, it is only at the differing behaviorological level of analysis that an account of *why* (in terms of "reasons") that response occurred can be rendered with equal objectivity.

and the science of philosophy as part of its own establishment the natural science community remains ill-prepared to deal effectively with the challenge of widespread superstition, both in the culture at large and among its own ranks.

Arguably, it is the natural science community per se that should play the leading role in establishing behaviorology within the culture. Perhaps the best first step would be the initiation of behaviorology research and training programs within academic subdivisions that are controlled by the natural science community. The natural science community is where that organized discipline would logically reside, because behaviorology serves that community in a foundational way.

In facilitating the organization and establishment of behaviorology as a cultural entity, the natural science community would seem to be taking an important further step in its own development. The indefinite forfeiture of the whole realm of behavioral phenomena to the province of organized superstition seems culturally counterproductive as does leaving the field of behavior, especially human behavior, to peripheral skirting by the physiologists.⁸ ✻

References

- Fraley, L.E. (2008). *General Behaviorology: The Natural Science of Human Behavior*. Canton, NY: ABCs. ✻

⁸ A comparison of the discipline featured in this book with that found in comprehensive physiology books reveals two readily distinguishable disciplines. While the answers to some questions in the field of behavior may be improved by contributions from both disciplinary perspectives, many other questions require the unique perspective of just one of those disciplines. Because their respective levels of analysis differ, neither of those disciplines can be regarded logically as a subclass of the other.