

Introduction

The General Nature of This Book, and the Audience at which it is Directed

*T*his book is addressed to a global culture that has evolved with a substantial imbalance in the objectivity exhibited by its people. Over the past several centuries maturing basic sciences of energy, matter, and living structures, each informed by a philosophy of naturalism, have yielded great progress in a wide variety of fields that contribute to human well being. As a general result, people can live longer, more comfortably, and more prosperously than their predecessors.

Nevertheless, the evolving natural science community, which has produced such notable improvements in the human condition, has come to be characterized by a striking and increasingly critical deficiency. The current roundtable of the natural science community has a conspicuously empty chair. The fundamental sciences of physics, chemistry, and biology are represented, and depending on the preferred scheme by which the natural science community is subdivided into its constituent neighborhoods, others formed from components of those three may be included. But the formal chair reserved for a natural science of behavior—determining functions—the study of the functional relations between behavior and environment, taking into account factors in both the internal and external environments of the behaving body—has gone unoccupied.

Modern ethologists have forged ahead on the biological front to provide increasingly detailed accounts of *how* a body intrinsically mediates the behavior that it exhibits, but that level of analysis is quite unsuited to address the broad issue of *why* a particular response or a particular kind of behavior is occurring. That issue remains the province of the distinctly different science that is set forth in this book.

The continuing absence of an organized and fully supported natural science of behavior—controlling functions (especially those pertaining to human behavior in relation to its environment) within the natural science community leaves the kind of void that is always quickly and opportunistically filled by the forces of organized superstition. Moreover, the nature of such a behavior-related discipline, informed exclusively by natural philosophy, has gone largely unrecognized within the natural science community while its members have tentatively pursued compromises with the extant but fallacious alternatives. This book represents an educational vehicle by which that deficiency may be overcome both expeditiously and comprehensively.

In general, scientific practice is always brought to bear in pursuit of the implications of prevailing philosophical assumptions, and the results are then interpreted from the perspective of those assumptions. However, most of what is now accepted as behavior science is not *natural* science, because the fundamen-

tal assumptions that inform its interpretations are products of conventional superstition rather than products of objectively supported induction. However, if those assumptions are products of superstitious indulgence, then to the extent that their implications are pursued via good scientific methods, that good science tends to be wasted in pursuit of the fallacious implications of unfounded philosophy. Any potentially worthwhile findings via that kind of scientific practice, when interpreted according to such invalid philosophical assumptions, tend to be presented with whatever nonsensical characteristics may be required to maintain conformity with those fallacies. Often that involves interpreting such a finding in a bizarre way that implies its role in some fictitious relation.

Full citizenship in the natural science community requires not only the practice of objective scientific methods but also the assumption, induced from an extensive history of objectively established evidence, that the universe is a natural place. According to that general assumption and in accordance with the implications of the term *natural*, all real events are measurable and are linked to other events via functional relations that are established by transfers of energy.

Within the general scientific realm, training programs, even in the natural sciences, have been criticized for neglecting the essential philosophy of naturalism while focusing on scientific method. Arguably, the philosophy of naturalism tends too often to be left to the personal induction of each trainee even though many of them, when arriving for their natural science training, are already thoroughly indoctrinated with alternative philosophy anchored in superstition.

To the extent that those charges of neglect are valid, such curricular deficiencies in the areas of natural philosophy and comparative philosophy can be explained in part by reference to the prevailing tradition of personal freedom of thought, which in countries such as the United States of America is constitutionally guaranteed. (*Freedom* in that sense implies an absence of government-enforced coercion of thought). Trainers in the natural science programs of public institutions are permitted to test students and hold students accountable for their practice of objective scientific methods, but those trainers may not similarly impose criteria for the philosophical assumptions that will steer the professional work of their trainees and serve as the conceptual framework within which those trainees will interpret the results of their scientific work.

At best, the trainers may only teach descriptively and comparatively about natural philosophy, but may not withhold academic credit or credentials from a student whose personal professional behavior fails to reflect an appropriate naturalism. That is, the schools, operating under the control and auspices of the governmental agency of education, are constitutionally prohibited from the exercise of any such selective quality-control with respect to the personal thought of a student. This prohibition does not necessarily preclude natural science faculties from producing students with appropriately balanced scientific and philosophical behavioral repertoires. However, it represents a dangerous precipice along the philosophical edge of the curricular playing field near which too few natural science teachers are prepared to tread, and many safely confine their activity to the scientific methodological side of the field.

At the same time, in the private sector, the established forces of well organized superstition operate intensely and comprehensively, if often informally, beyond any such constitutional restraint, and typically they maintain unrelenting lifelong superstition-based programs of indoctrination. There, social requirements to comply usually substitute for academic requirements and typically do so with equal or greater effectiveness.

One result may be academically credentialed “natural” scientists that account for any phenomena that lie beyond their personal analytical frontier by conjuring forth whatever mystical force seems adequate to have produced them. Instead of respecting the boundaries of their ignorance, they superstitiously install fictitious causes for what lies beyond. The subsequent disposition of those fictional constructs can then be awkward when eventually scientific progress overtakes those phenomena or when those “scientists” discover that, previously unknown to them, that has already happened.

Practitioners of traditional “social science” fields that focus on behavior have tended to indulge heavily in such false accounting. They have relied heavily on both (a) the existence of self-agents that exercise free will and (b) the voluntary nature of the behavioral expressions that purportedly originate wholly or partly with such intrinsic self-agents. Such assumptions afford a basis for an implicit personal responsibility, where *personal* alludes to the putative behavior-managing self-agent. Although these ideas continue to prevail in contemporary culture, and historically, human languages have evolved to reflect them, a natural science of human behavior does not lead to them.

Contrary to some popular wishful thinking that occurs around the fringes of the general scientific community, pursuing the implications of mystical philosophy in accordance with strict scientific methods cannot carry philosophically compromised disciplines into the domain of the natural sciences. That is because objective analytical methods alone do not complete the qualifications for citizenship in the natural science community. Also required is the assumption that all events are functionally derived from theoretically traceable preceding events in what is called a natural history—an assumption that arises inductively from a long history that is devoid of objectively established exceptions.

All of the observable phenomena that purportedly are being analyzed via a mismatched science and philosophy are amenable to investigation from the perspective of naturalism. However, such purely naturalistic inquiries require a substantially different kind of scientific and philosophical treatment than the kind that prevails in the contemporary social sciences where philosophical vagaries yield disparity that can reduce disciplinary integrity below the threshold of scholarly discernment.

A mysterious self-agent, when presumably deciding on the behavior that it directs its host body to execute, may be influenced by events in its environment. But, in most versions of that popular myth, that mysterious agent remains the final arbiter. Such assumptions inform a very different behavior-related discipline than does the assumption that a behavioral response is the dependent variable in an inevitable and entirely natural function in which the independent variables are both measurable and theoretically controllable. While both

kinds of science may feature respectable methods of phenomenal examination, only one of them could qualify its practitioners for membership in the natural science community. Citizenship in the natural sciences requires that the philosophical assumptions, which inform the scientific activity and serve as the basis for the interpretation of its findings, derive via objectively based induction rather than via uncritical adoption from the cultural palette of speculative lore.

As the human population grows and the planet undergoes a relative technological shrinkage, human behavioral problems that in antiquity played out in the obscurity of isolation now, increasingly, can threaten on a global scale. Today, the ineffective address of a serious behavioral problem can have adverse implications that may quickly grip the entire planet. Such apocalyptic threats include multinational war, pandemic disease, extensive famine, worldwide economic collapse, and the global exhaustion of natural resources. In almost all cases, such calamities can be traced to behavioral failures that substantially exacerbated the disaster or in some cases initiated it outright.

Many ancient problems went unsolved by the forces of organized superstition and had to await the emergence of modern physics, chemistry, biology, and the various sciences that derive as applied composites of those more basic sciences. Unfortunately, many increasingly threatening *behavior*-related problems continue to await resolution via an emergent natural science of behavior. Traditionally, behavioral problems have been left to the non-natural behavior sciences, and, predictably, those problems continue to stress the culture, in some cases on a planetary scale. The relevant natural science of behavior, being of relatively recent emergence, is only in the incipient stage of establishing membership in the basic natural science community. And without the cultural support of that community, the practitioners of the basic natural science of human behavior cannot bring the full potential of their discipline to bear on important behavior-related problems, many of which continue to expand and intensify their threats to human well-being.

Efforts spanning a century or more by various natural scientists have targeted the traditional socio-behavioral science community in unrelenting attempts to render its philosophical underpinnings more objective—to convert its practitioners from superstitiously generated philosophical assumptions to the kind of objectively supported naturalistic assumptions that inform modern natural scientists in physics, chemistry, and biology. To a substantial degree, those efforts at conversion have continued to fail, largely because an early and substantial program of superstitious conditioning typically leaves a human intellect very resistant to a strict and generalized objectivity. This is understood so well at the intuitive level of common lore that the folly of such an attempt is a common dramatic theme and underlies familiar admonitions to avoid trying to talk people out of their superstitiously informed ideas, especially those that are bolstered by religious zeal.

Given the long and substantial establishment of the traditional social sciences within contemporary human culture, many advocates of the newly emergent natural discipline for inquiry into behavioral phenomena have hopefully joined the impractical attempt to invest the traditional social science community with naturalism. As predictable, that approach has proven wastefully

difficult, because, at the practical level, the people to whom such appeals are directed cannot afford the implications of the extensive changes in their lives that an inductive leap to naturalism would require of them.

The adoption of a philosophy of naturalism by a social scientist who has been steeped in the traditional philosophical ideology would, in most cases, be fraught with many adverse implications for such a convert. That person would come to realize that one's perhaps limited resources and opportunities for career training had been wasted on the pursuit of a largely invalid and ill-conceived curriculum. Furthermore, one would have to accept that some if not all previous professional accomplishments, however prestigious, represented misguided interpretive exercises. Convinced of the validity of the new perspective but inexperienced with the relatively unfamiliar science that it supports, one might recognize that one is insufficiently prepared to proceed immediately on the basis of the new fundamental assumptions, at least at the former level of one's professional productivity.

On the domestic front, one could find that one was sharing one's life with a person, who, remaining locked in the grip of the old philosophy, will be unable to understand and accept one for the new kind of person that one will have become. That could also be true of one's relatives and friends. In addition, having perhaps indoctrinated one's children in the kind of philosophical framework that comported with the perspective that one is being challenged to abandon, as a convert to naturalism one could face a diminished or estranged relation with one's own offspring.

If the traditional social scientists to whom natural scientists often direct their proselytization in behalf of naturalism could afford the honesty, many would inform the intruding naturalists that, as committed social scientists, they cannot afford to know what those naturalists are telling them, however objectively compelling the arguments for it may be. Natural scientists tend to insist that acquiescence to logic must trump a disparate nurture—a popular folly within the natural science community. Such a pregnant expectation comes easily to natural scientists, because intrinsic to the culture of their natural science community, nurture is perhaps inconspicuously but always carefully crafted to instill precisely that compatibility with objectivity. But beyond the natural science community objectivity is often merely tolerated in a limited way as a matter of practical necessity, remaining ignorable in favor of superstition when opportunities arise.

This book represents an abandonment of that traditional and somewhat quixotic quest by natural scientists to proselytize for fundamental objectivity among people who bring superstitiously derived philosophical assumptions profoundly to bear on the interpretation of results from their carefully respected scientific methods. That kind of attempted persuasion, which has tended to characterize the approach of natural scientists to traditional social scientists, would substantially distort the explication of the complex and challenging subject matter of a book such as this. Furthermore, continual attempts to avoid eliciting aversive emotional reactions in superstitiously invested readers while attempting to make naturalists out of such mystics typically requires a degree of euphemistically crafted circumspection that would fatally dull the

explicative precision demanded by both the purpose and the subject matter of this work. In a departure from the course followed by many earlier presentations of the emergent natural science of behavior, this book is not addressed as a persuasive treatise to the traditional behavior–focused social science community.

Specifically, this book is addressed to the citizens of the *natural* science community. It presents the naturalistically informed basic behavior science discipline that is necessary to complete the profile of scientific neighborhoods that must compose the natural science community if that community is to address the full spectrum of problems that confront humankind. Unfortunately, those who apply scientific methods in service to mystical assumptions may opportunistically exploit behavioral problems, but they cannot solve them any more effectively than they solved the other kinds of problems that were eventually addressed and solved by physicists, chemists, biologists, and others with composite skills thereof. With the place reserved for a *natural* science of behavior standing vacant, the natural science community remains compelled to abandon an increasingly critical domain of problems to the forces of organized superstition. With the emergence of a natural science of behavior that traditional forfeiture is no longer necessary.

The Style and Thematic Development of This Book

The contents of this book are presented in three parts. The early chapters (1–13) define behavior per se, set forth the scope and bounds of a natural science of behavior, and proceed to introduce the fundamentals of a naturalistic behavior science while revealing its contrast with the traditional alternatives. The middle chapters (14–26) represent reiterations of the basics as they are being woven into more advanced treatments that tend increasingly to reveal the analytical power of the discipline. Some of the advanced topics in the middle section may suitably constitute the respective themes of advanced courses in training programs.

In the third part of this book, a series of chapters (27–30) presents a demonstration of the power of this discipline by addressing effectively, at a unique level of analysis, a series of ancient behavior–related mysteries of humankind—mysteries that, for lack of an appropriate basic science, the natural science community has largely been forced to relinquish to the agencies of organized superstition. To appreciate those latter chapters will require the repertoire conditioned through the first two parts of this book, but the spectacle of long–intractable problems falling like a row of dominoes before a powerful new science will justify the preparatory read for most authentic scientific scholars who are new to behaviorology.

Furthermore, the subject matter of each basic natural science will always have some perhaps ill–defined interface with the subject matter of the other natural sciences. Some of the most important work in the basic natural sciences occurs with respect to the phenomena in their overlapping subject matters. Natural scientists who read and to some extent master the discipline that is explicated in this book will have prepared themselves to handle phenomena in

their own area that in some way pertain to behavior–determining functions and to do so without having to compromise their naturalism.

This heavily conceptual treatment focuses almost entirely on human behavior in familiar contexts. Through its extensive analyses of familiar behavioral events, readers can relate this basic science to their own lives.

This book is designed to teach what it has to say. Principles and practices are often introduced at one level of consideration and subsequently reiterated in increasingly complex contexts throughout the remainder of the book. The text thus returns repeatedly to important points as concepts mature. Rich in both examples and opportunities for concept verification, this book features the increasingly complex reprises that tend to be appreciated by persons working to understand or master behaviorology as well as by practitioners of that science who are reviewing its fundamentals and their implicative complexities. Thus, this book is not only a basic reference to the fundamentals of the discipline; it is also designed to support the independent study of naturalism as it is exemplified by behaviorological science.

Beginning with the most elementary fundamentals and maturing to an assault on some the most seemingly impenetrable behavior–related complexities that have teased the human intellect since antiquity, this book is constructed to fulfill certain behavior–engineering objectives. Specifically, it has been crafted not only as a device to familiarize mature natural scientists with behaviorology, but also to condition future behaviorological specialists who are approaching this discipline as naive initiates. This book is designed to facilitate a degree of mastery that carries from first principles to the intellectual frontier of the discipline. To conduct the reader through such a program of conditioning requires more iteration than is typically necessary in a simple overview of behaviorology for a mature natural scientist who already ably represents one or more of the other natural science disciplines. Thus, with respect to levels of detail, such a mature scholar's progress in reading this book may exhibit a selectivity that is guided by the comfort of a more profound understanding, as they say. Nevertheless, having been subjected to traditional behavior–related training and to the general cultural indoctrination about behavioral matters, one's confidence in what one has long assumptively accepted about behavior should be held suspect by a typical natural scientist who is proceeding into this book.

This book introduces an integral and complex natural science discipline that focuses its science on human behavior. It is called *behaviorology*. Its subject matter traditionally has been left to psychology and other social sciences, most of which entertain interpretive explanations that are informed by metaphysical assumptions and rely heavily on hypothetical models and metaphorical reports. In contrast, this book is focused on testable functional relations between environment and behavior, a characteristic that imparts to behaviorological practitioners the technological capacity of an engineering discipline. In this comprehensive introduction to a natural science of behavior, readers will find no explanatory reliance on what may be familiar and perhaps comfortable mystical concepts of this subject matter, which in any natural science are deemed redundant.

Private internal events, including those that occur in brains, while presenting problems of accessibility, are not ignored provided they have a natural existence. However, this book repeatedly illustrates the conceptual devices through which a natural science of behavior–environment relations avoids a troublesome explanatory reliance on inaccessible private interiorities in its practical address of its subject matter. Later chapters, with the help of the philosophical reconsideration of scientific measuring that occurs in an earlier chapter, appropriately extend the philosophy and science to support analytical penetration to relevant private events.

The Organization of the Natural Science Community

Various descriptions of the internal organizational structure of the natural science community have been based respectively on differing considerations. Respective scholars tend to produce differing charts, each of which is purported to reveal the disciplinary structure of the natural sciences.

Basic versus applied. Divisions based on the distinction between theoretical abstraction and applied practicality have led to traditional basic–versus–applied categorizations. For example, both theoretical physics and fluid dynamics (as the latter is commonly taught in schools of engineering) might be aligned along the same track with the theoretical version coming first to suggest its basic support of the more applied specialization that follows. A similar distinction can be recognized between the principles of basic metallurgy and the practical engineering applications that are based on the metallic properties of respective batches of metal. Archaeologists may bring basic principles of metallurgy to their analyses of the properties of metallic artifacts when constructing estimates of the technological sophistication of ancient cultures. Another track might begin with basic chemistry that, in turn, is linked to other sciences that apply chemistry to the solution of certain practical problems that they address. One such link would lead to geology where, for example, one application could involve the development of a new chemical “wet test” by which the identity of a mineral specimen can be revealed even when an available specimen occurs in the form of a particularly deceptive variant.

Reduction. Another categorization of the natural sciences is based on reduction. In such schemes one domain of scientific inquiry is said to be more basic than another if the accounts of the phenomena in a second domain are subject to a more fundamental interpretation in the terms, principles, and relations of the first domain. That is, it is said that the second domain may be revealed as an aspect of the first domain via such an analytical reduction process.

Thus, in accounting for chemical phenomena, it is possible to provide a more fundamental interpretation that is cast in the terms, principles, and relations of physics. Among the involved scientists the idea that chemistry is the physics of molecular interactions has often emerged intuitively. Similarly, accounts of biological phenomena can often be recast at the analytical levels of chemistry and physics, and modern biology textbooks contain frequent forays

into chemistry and physics to complete more satisfying accounts of the biological phenomena that are under current consideration.

In a classification scheme for natural sciences that is based on that kind of reduction, physics tends to be regarded as the most basic of the natural sciences. The other natural sciences then stem directly or indirectly from physics in the sense that whatever is to be explained in one of those domains of inquiry, regardless of its descriptive treatment in the special terms of its own scientific neighborhood, is subject to a more fundamental explanatory account via recourse to the perspective of the more basic level of matter and energy. Thus, while each natural science beyond basic physics has its own well evolved descriptive, taxonomic, and explanatory style, its explanatory aspects are generally regarded as being subject to reduction to the analytical level of physics. (Some readers may sense that both the basic-versus-applied kind of distinction and the distinction based on reduction may be appealing to different facets of the same fundamental class of evidence.)

Sociocultural importance. Yet another classification scheme for the natural sciences is based on their respective sociocultural importance. Given two natural sciences, the relatively more important science is classed, on that basis, as the more basic one.

While each scientific practitioner may assert the relative merit of a favored science, the culture at large, via its school systems, has quietly resolved the issue. While a wide variety of scientific subjects can be found in the collective curriculum of the secondary schools of culturally advanced countries, nearly all such schools provide a core of physics, chemistry, and biology. Those three sciences have emerged as basic via agreement about their importance as expressed through their widespread establishment in school curricula. Where course requirements are enforced with respect to the natural sciences, those three sciences tend to be among those featured at the top of the list for required study, while in the generally crowded school curricula other natural sciences, if available for students, tend to be offered less frequently and usually as electives.

The classification of natural sciences in this book. One major objective of this book is to press a particular point—namely, that the accelerated advance, across the past few centuries, of physics, chemistry, and biology (as well as the more phenomenally-specific sciences that draw from those three in various proportions) has resulted in an increasing qualitative imbalance in human culture. That is because, across that interval of accelerating progress, a natural science of behavior has been absent from the natural science roundtable.

This book presents, rather comprehensively, a *natural* science of human *environment-behavior relations* that can fill the obvious gap in the profile of the basic natural sciences. The argument is that behaviorology must be included as the fourth basic natural science among those that are endowed with such prominence by the adverse cultural implications of their potential respective neglect. Obviously, to say that physics, chemistry, biology, and behaviorology are basic in that sense clearly casts the term *basic* as a term of importance (relative to other natural sciences).

Behaviorology can also be fitted into any of the other schemes of classification for the neighborhoods in the natural science community. As the reader of

this book will discover, behaviorology is a descriptive, explanatory, and taxonomic natural science of behavior-determining functions. It is fundamentally the science of the functions that account for *why* behavior occurs (as opposed to *how*, physiologically, it occurs, which is a line of inquiry that is left largely to biology). As with all functions featuring objectively measurable variables, from an explanatory perspective, the analytical accounts for the functional relations in behaviorology are reducible to the analytical level of physics—a reduction that can be pursued largely via traces of the increments of energy that establish function. Such reductions are to some extent pursued in this book. However, the purely descriptive level of behaviorology that inheres in the speech and writing of behaviorologists as they communicate about what they are studying is less implicative of such reduction. Hence, behaviorology is often said to feature its own level of analysis, which contributes to the uniqueness of its disciplinary identity.

Mystical Accounts: Their Implications and Resistance to their Proffer

People tend to exert strong social pressure on others to explain most any phenomenon that is being encountered. People want answers to questions about what it is, how it works, its historical details, and the role that it is playing relative to other things. Typically, the pervasiveness and compulsive force of that kind of social pressure to explain things far outstrips the capacity of an individual to provide valid objective accounts. Unfortunately, the continuing social aversiveness for the explanatorily bankrupt responder cannot be terminated by a simple “I don’t know,” because, beyond the relatively small natural science community, mere professions of ignorance per se tend to be subject to a rather unrelenting general social punishment.

Thus are created those common social situations in which relief can be gained by quick recourse to invented pseudoexplanations. Such fake accounts need only to be accepted by an insufficiently critical audience, so the extent to which such phony explication may be illogical or absurd is irrelevant as an independent criterion. Frequently, successful pseudoaccounts often reduce to clichés. A culturally enduring one, as part of the cultural lore, may emerge as a thread woven tightly into prevailing, unquestioned, and widely promulgated ideology. One result is culture-wide patterns of superstition in which indulgence is generally deemed fashionable and which attract the substantial personal investments of a large number of people.

The intellectual maturity of the human species can be measured by the extent of the resistance both to the tendency to resort to such blatantly invalid accounts and to the superstitious tendency to accept them. Such a gauge is applicable either to the species or to its respective individuals. Normatively measured, the human species, languishing in an inchoate intellectual state, awaits a resolution of the contest between its survival and its potentially lethal investments in superstition.

Within human culture the natural science community has emerged as a leading force in support of objective rationalization. Yet that community, defending objective thought from its basic redoubts of physics, chemistry, and biology, remains relatively small and somewhat socioculturally beleaguered. Furthermore, the natural science community is insufficiently constituted for the cultural role that it is playing. To realize its potential for lifting the human species from the grip of superstition and propelling human progress forward along the course toward intellectual maturity, the natural science community must expand its own intellectual resources. Human intellectual progress now depends on a natural science of human behavior, and as this book makes clear, such a science has finally emerged from amid a plethora of intellectually compromised substitutes. The natural science community must now fully incorporate this natural science of human behavior, because the social and intellectual progress of the human species is again stalling against a wall of unsolved problems, but this time they are *behavioral*.

The Cultural Contribution Enabled by the Distinctiveness of Behaviorology

The traditional natural sciences have evolved largely in the absence of a natural science of behavior–environment relations. The result is that, regardless of the scientific progress that characterizes the current era, even most scientists find themselves without the capacity to render detailed naturalistic analytical explanations of *behavioral* phenomena, especially the human kind. Although a discipline by which to do that has been approached in biology by the ethological physiologists, the disciplinary traditions of biology have kept the various kinds of biologists strongly focused on the role of genetically determined body structure to account for behavior and on the intrinsic bodily mechanisms by which behavior manifests.

While the biological level of analysis can effectively address a question of *how* a specific response occurs bodily, it remains much less suited to address a question of *why* that specific response occurs, especially when that response represents more than a simple reflex. The latter question of *why* a response occurs, or does not occur, falls within the province of behaviorology. While both behaviorologists and biologists take environmental determinants into account, historically, it was not from strictly biological foundations that the science presented in this book could have emerged (see Chapter 1). In general, those two disciplines operate at different levels of analysis with each of those disciplines making its respective and mutually exclusive contribution.

Behaviorology is a *natural* science of the behavior–related phenomena that the traditional social scientists of behavior have addressed, but behaviorology proceeds without their often easy reliance on the superstitious assumption of an agential behavior–determining self (a.k.a. the proactive behavior–initiating mind) that presumably lurks within and somehow underpins the more important of the observable behaviors that a person exhibits. The contingencies under which most traditional socio–behavioral scientists practice have never

compelled them in general to separate their basic behavior–pertinent ideology from the mystical notion of a somewhat autonomous body–directing self–agent that imparts the kind of supernatural status that is typically implicit in the term *sentience*. Furthermore, there is little if anything in their typical social science training programs that explicitly disabuses a trainee of such essentially mystical assumptions.

This disciplinary distinction inheres at the philosophical level of consideration. It has been the philosophy of the natural sciences that has prevented the wasteful application of the potent technical arsenal of the natural scientists on invalid questions about, for example, how many angels can dance on the head of a pin, or more realistically, questions about how a putative self (whatever that is) can “make a choice.” Likewise, behaviorologists rely on the philosophy of the natural sciences to prevent distracting and wasteful searches among the physiological features of a nervous system for a proactive mind that somehow can rather autonomously and spontaneously initiate the behavioral activity that its host body subsequently executes. Good philosophy prevents folly in the doing of science regardless of the subject matter that is being addressed.

Today, when the world’s most reputable natural scientists speak about the phenomena upon which their careers have been focused, they typically wax profoundly, usually with a well honed philosophical and scientific sophistication. But when those same people begin to address behavior–related phenomena, they often revert uncritically to mysticism—a legacy of the highly superstitious culture in which we have all been compelled to dwell. Behaviorology is the natural scientific discipline that rids peoples’ consideration of behavior of superstitious thinking just as earlier natural sciences have allowed people to expel superstition from their explanations of energy, matter, and life forms.

Only as we succeed in the expulsion of superstition from the study of behavior can we make the kind of progress with behavior that characterizes progress in the traditional natural science fields. This book is devoted to that cause. Its contents enable all who would subscribe to the doctrine of naturalism to include human behavior among the phenomena subsumed by that intellectual perspective. Human behavior is arguably the class of phenomena with respect to which a naturalistic consideration may be of the greatest importance. Historically, however, the culturally–established natural science community has remained unprepared to mount a balanced assault on the broad spectrum of difficult problems that confront humankind, because a major class of behavior–related problems have, by default, been left in the mire of formal and informal superstition.

As a result of this unbalanced scientific progress, the qualitative advance of human culture has become increasingly irregular. Current progress toward cultural maturity features awesome advances on fronts requiring only limited reliance on effective behavior science and at the same time exhibits a rather extreme retardation along fronts that pertain to the causality and control of human behavior. That growing imbalance in scientific capability increasingly threatens to disrupt the entire human culture, although few of its individuals (arguably far too few) are prepared to appreciate the nature of that kind of threat.✿