

If you don't like my book, write your own. If you don't think you can write a novel, that ought to tell you something. If you think you can, do. No excuses. If you still don't like my novel, find a book you do like. Life is too short to be miserable. If you do like my novels, I commend your good taste.

—Rita Mae Brown, *Southern Discomfort*

NATURALISTIC INQUIRY

Yvonna S. Lincoln
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1

Postpositivism and the Naturalist Paradigm

And as we think, so do we act.

(Schwartz and Ogilvy, 1979)

PARADIGMS AND PARADIGM ERAS

The history of humankind is replete with instances of attempts to understand the world. Our curiosity has been directed at the same fundamental questions throughout time; our progress as inquirers can be charted by noting the various efforts made to deal with those questions. What is the world? How can we come to know it? How can we control it for our purposes? What is, after all, the *truth* about these matters?

The concept of truth is an elusive one. Julianne Ford, in her delightfully whimsical book, *Paradigms and Fairy Tales* (1975), asserts that the term *truth* may have four different meanings, which she symbolizes as Truth₁, Truth₂, Truth₃, and Truth₄. Truth₁ is the familiar *empirical* truth of the scientist; a claim in the form of hypothesis or predicate (an affirmation or denial of something) is T₁ if it is consistent with "nature" (or, in Ford's own language, "preserves the appearances."¹ Truth₂ is *logical* truth; a claim (hypothesis or predicate) is T₂ if it is logically or mathematically consistent with some other claim known to be true (in the T₂ sense) or ultimately with some basic belief taken to be T₁ (to which we shall return in a moment). Truth₃ is *ethical* truth; a claim is T₃ if the person who asserts it is acting in conformity with moral or professional standards of conduct.²

Truth₄, with which we are most concerned here, may be called *metaphysical* truth. Unlike the case of a claim's being T₂, T₃, or T₄, a claim that is said to be T₁ cannot be tested for truthfulness against some external norm such as correspondence with nature, logical deducibility, or professional standards of conduct. Metaphysical beliefs must be accepted at face value; as Aristotle knew (Reese, 1980, p. 70) and Ford affirms, basic beliefs can never be proven T₄—in conformity with

nature—or False₁. They represent the ultimate benchmarks against which *everything else* is tested, for if there were something more fundamental against which a test might be made, then that more fundamental entity would become *the* basic belief whose truth (T₁) must be taken for granted.

Now certain *sets* of such basic or metaphysical beliefs are sometimes constituted into a *system of ideas* that "either give us some judgment about the nature of reality, or a reason why we must be content with knowing something less than the nature of reality, along with a method for taking hold of whatever can be known" (Reese, 1980, p. 352). We shall call such a systematic set of beliefs, together with their accompanying methods, a *paradigm*.³

Paradigms represent a distillation of what we *think* about the world (but cannot prove). Our actions in the world, including actions that we take as inquirers, cannot occur without reference to those paradigms: "As we think, so do we act." But, while paradigms are thus enabling, they are also constraining:

A paradigm is a world view, a general perspective, a way of breaking down the complexity of the real world. As such, paradigms are deeply embedded in the socialization of adherents and practitioners: paradigms tell them what is important, legitimate, and reasonable. Paradigms are also normative, telling the practitioner what to do without the necessity of long existential or epistemological consideration. But it is this aspect of paradigms that constitutes both their strength and their weakness—their strength in that it makes action possible, their weakness in that the very reason for action is hidden in the unquestioned assumptions of the paradigm. (Patton, 1978, p. 203)

It is the authors' posture that inquiry, whether in the physical or social sciences, has passed through a number of "paradigm eras," periods in which certain sets of basic beliefs guided inquiry in quite different ways. We shall briefly describe these periods as prepositivist, positivist, and postpositivist, and show that each period had its own unique set of "basic beliefs" or metaphysical principles in which its adherents believed and upon which they acted. We shall take the position that the positivist posture, while discredited by vanguard thinkers in every known discipline, continues to this day to guide the efforts of practitioners of inquiry, particularly in the social or human sciences. Further, we shall argue that, since these methods are based on metaphysical principles that are dissonant with the principles guiding the vanguard development of substantive (discipline) thought, it is imperative that inquiry itself be shifted from a positivist to a postpositivist

stance. For, if a new paradigm of thought and belief is emerging, it is necessary to construct a parallel new paradigm of inquiry.

SOME CAVEATS

In discussing the eras through which paradigms have passed, it will be easy to assume that there exists somewhere *the* paradigm that past efforts at paradigm formation have approximated more and more closely. If science could successfully converge onto that paradigm, then it could quickly tease out its consequences, test them in the empirical world, and come, finally, to "true" understanding. A study of the history of science might be very important if we are to achieve an understanding of those successive approximations; it might be asserted, as Barnes suggests, that "the subject matter of the historian of science can only be demarcated by recognizing what it is in the past that exhibits causal continuity with present science" (cited in Hesse, 1980, p. 47). But, as Hesse (1980, pp. 4-5) points out:

The present is in this crude sense the standard of truth and rationality for the past, and gives the inductivist historian grounds for the reconstruction of past arguments according to an acceptably inductive structure, and for judging past theories as simply false and often ridiculous. *Such inductive history is of course, among its other defects, self-defeating, because if all theories are dangerous and likely to be superseded, so are the present theories in terms of which the inductivist judges the past.* (emphasis added)

We may draw from these remarks the following caveat: Since all theories and other leading ideas of scientific history have, so far, been shown to be false and unacceptable, so surely will any theories that we expound today. This insight induces a certain degree of humility in claims for the "ultimate truth" (T_1) of anything that is asserted here. This book should therefore be regarded not as an attempt to make ultimately true (and modern) pronouncements, but as an effort to mark our place along the path of understanding—a path that unfortunately is never ending. We are not setting forth a new orthodoxy; instead, we aim to make it a little more difficult to hold onto the old.

A second caveat is that theories, whether scientific or otherwise, are remarkably immune to change; hence one cannot expect an easy time of it when proposing something as radical as a paradigm revision. Theories are, to borrow a term from modern organization theory, "loosely coupled" (Weick, 1976.) There is, as Hesse (1980) suggests, a "many-to-one" relation between theoretical and practical facts; it

is possible to fit many different idealizations (theoretical facts) to a single practical fact:

Many conflicting networks may more or less fit the same facts, and which one is adopted must depend on criteria other than the facts: criteria involving simplicity, coherence with other parts of science, and so on. Quine, as is well known, has drawn this conclusion explicitly in the strong sense of claiming that any statement can be maintained true in the face of any evidence: "Any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system." (Hesse, 1980, p. 86)

Thus the loosely coupled nature of theories makes it possible for scientists to squirm mightily before giving up a theory (or a paradigm). Any conflicting fact can be accommodated by making adjustments elsewhere in the system.

Along the same lines, Wimsatt (1981, p. 134) has noted what he terms the "robustness" of prevailing theories, a robustness, he claims, that derives from the fact that portions of theory are "walled off from" (loosely coupled to) one another:

The thing that is remarkable about scientific theories is that the inconsistencies are walled off and do not appear to affect the theory other than very locally When an inconsistency occurs, results which depend on one or more of the contradictory assumptions are infirmed. This infection is transitive; it passes to things that depend on these results, and to their logical descendants, like a string of dominos—until we reach something that has independent support. The independent support of an assumption sustains it, and the collapse propagates no further. If all deductive or inferential paths leading to a contradiction pass through robust results, the collapse is bounded within them, and the inconsistencies are walled off from the rest of the network. For each robust result, one of its modes of support is destroyed; but it has others, and therefore the collapse goes no further.

Thus the failure of a paradigm to be fully coherent, that is, entirely internally consistent,⁴ can also be one of its chief defenses against challenge. As paradigms are assaulted by "facts" that do not fit, the facts can be walled off—a possibility only because the paradigm is loosely coupled. Further, even those elements of the paradigm that are most affected by the conflicting facts may be supported in independent ways—a fact that could not obtain if the paradigm were completely coherent. The result of this state of affairs is that it becomes possible for adherents of the paradigm to resist stoutly, even if at times irrationally, the efforts of others to replace it. Making it even a little

more difficult to hold onto the old paradigm may itself turn out to be an enormously difficult task, not one to be taken on by the fainthearted!

THE PREPOSITIVIST ERA

Of the three "paradigm eras," the prepositivist is both the longest and the least interesting from a modern perspective; indeed, its lack of provocative acts and ideas is best illustrated by its very title—*prepositivist*. This era is simply a precursor to the more exciting period that followed. It ranges over a period of more than two millenia, roughly speaking, from the time of Aristotle (384-322 B.C.) to that of (but not including) David Hume (1711-1776). One might expect that "science" would have made enormous strides over such a long period, but it did not, largely because Aristotle (and many other prepositivists) took the stance of "passive observer" (Wolf, 1981). What there was in "physis," Aristotle argued, occurred "naturally." Attempts by humans to learn about nature were interventionist and unnatural, and so distorted what was learned. Wolf (1981, p. 22) comments:

Aristotle believed in natural motion. Humans' interference produced discontinuous and unnatural movements. And, to Aristotle, such movements were not God's way. For example, Aristotle envisioned the idea of "force." The heavy cart being drawn along the road by the horse is an unnatural movement. That is why the horse is struggling so. That is why the motion is so jerky and uneven. The horse must exert a "force" to get the cart moving. The horse must continue to exert a "force" to keep the cart moving. As soon as the horse stops pulling, it stops exerting a "force" on the cart. Consequently, the cart comes to its natural place, which is at rest on the road.

Aristotle's mind was broad ranging enough to touch virtually every conceptual problem imaginable at his time. Not the least of these problem areas was that of logic. Aristotle contributed two principles, commonly known as the Law of Contradiction (which states that no proposition can be both true and false at the same time) and the Law of the Excluded Middle (which holds that every proposition must be either true or false), which, when applied to noninterventionist or passive observations, seemed sufficient to generate the entire gamut of scientific understandings that were needed (Mitroff and Kilmann, 1978). Wolf further observes:

Within the world of the mind, these thoughts occurred thousands of years ago. Scientists were passive then. It would take a while before

they would attempt to reach out and touch, to try ideas and see if they worked. (p. 23)

When scientists did begin to reach out and touch, to try ideas and see if they worked, in short, when they became *active* observers, science passed into the positivist period. The movement was slow; Isaac Newton (1642-1727) is said to have commented that "if I have seen further, it is because I have stood on the shoulders of giants." But the number of giants was exceedingly small. Only a few workers had emerged who went beyond Aristotelian science, and it is useful to observe that they also came from essentially noninterventionist fields: three astronomers (Copernicus, 1473-1543; Galileo, 1564-1642; Kepler, 1571-1630) and a logician/mathematician (Descartes, 1596-1650). Further, their work did little to challenge the prevailing paradigm of inquiry, however much it may have exercised established religion. It did, however, pave the way for that challenge.

THE POSITIVIST ERA

Positivism may be defined as "a family of philosophies characterized by an extremely positive evaluation of science and scientific method" (Reese, 1980, p. 450). Indeed, its early adherents saw in this movement the potential for the reform of such diverse areas as ethics, religion, and politics, in addition to philosophy, to which field it finally became confined. As a philosophy, the movement began early in the nineteenth century, primarily in France and Germany; its most powerful advocates in the twentieth century were formed into a group known as the Vienna Circle of Logical Positivists, which included philosophers and scientists such as Gustav Bergman, Rudolf Carnap, Philipp Frank, Hans Hahn, Otto Neurath, and Moritz Schlick, the last having founded the group. Schlick held an endowed chair at the University of Vienna that had been established in the memory of Ernest Mach, an extreme advocate of operationalism,⁵ whose ideas the group proposed to promulgate.

But positivism had its major impact not in reforming ethics, religion, and politics, or even philosophy, but scientific method. The concepts of positivism provided a new rationale for the doing of science that amounted to a literal paradigm revolution, although that revolution took place so slowly and was so imperfectly perceived by even the major actors caught up in it that its revolutionary character was never appreciated. If it is difficult for a fish to understand water because it has spent all of its life in it, so is it difficult for scientists—and

prepositivist scientists were no exception—to understand what their basic axioms or assumptions might be and what impact those axioms and assumptions have upon everyday thinking and lifestyle.

Given this slow and little-understood change, it is not surprising that different scientists and philosophers would have somewhat different views of just what positivism implied, and on what ground it stood. That confusion continues today, as can be seen from a reading of some representative authors on the topic. For example, David Hamilton, in a paper prepared for an informal workshop at the University of Illinois in 1976, suggests that positivism began with the publication of John Stuart Mill's *A System of Logic* in 1843. Hamilton (1976, p. 2) comments on this work:

Historically, *A System of Logic* was a powerful interpretation, formalization, and defense of the secular ideologies which had emerged alongside the political, economic, and social revolutions of the late eighteenth and early nineteenth centuries. Its twentieth century importance, however, is rather different. Mill's *Logic* offered a coherent set of principles of procedure for use in the social and natural sciences. Although subjected to considerable criticism . . . , Mill's original formulations have survived till the present day as the dominant methodological paradigm.

Hamilton summarizes Mill's assumptions as follows:

- (1) The social and natural sciences have identical aims, namely, the discovery of general laws that serve for explanation and prediction.
- (2) The social and natural sciences are methodologically identical.
- (3) The social sciences are merely more complex than the natural sciences.
- (4) Concepts can be defined by direct reference to empirical categories—"objects in the concrete."
- (5) There is a uniformity of nature in time and space. Hamilton comments that this assumption, itself an induction, enabled Mill to overcome Hume's objections to logical inference and thereby invested induction with the same procedural certainty as syllogistic logic. We may note that such an argument has been found to be invalid by modern philosophers; see the discussion below about the problem of the underdetermination of theory.
- (6) Laws of nature can be naturally (inductively) derived from data. Hamilton comments that Mill had little to say about theory because he held it to be isomorphic with "empirical uniformities."
- (7) Large samples suppress idiosyncracies ("partial causes") and reveal "general causes" (the ultimate laws of nature).

A second example: Wolf (1981, p. 56) discusses positivism in the guise of Newtonian mechanics, which he says rested upon the following assumptions regarding the "physical and therefore mechanical world":

- (1) Things move in a continuous manner. All motion, both in the large and in the small, exhibits continuity.
- (2) Things move for reasons. These reasons were based upon earlier causes for motion. Therefore, all motion was determined and everything was predictable.
- (3) All motion could be analyzed or broken down into its component parts. Each part played a role in the great machine called the universe, and the complexity of this machine could be understood as the simple movement of its various parts, even those parts beyond our preception.
- (4) The observer observed, never disturbed. Even the errors of a clumsy observer could be accounted for by simply analyzing the observed movements of whatever he touched.

A third example: Schwartz and Ogilvy, whose work will occupy a considerable portion of our attention in Chapter 2, describe the Newtonian "world view" as holding that matter consists of very small particles that are assembled into larger and larger complexes. The essential ideas are captured by the metaphor of the billiard table.⁶ The metaphor supports a deterministic physics—if we knew the masses, positions, and velocities of all the particles we could predict the future from the laws of physics. But Schwartz and Ogilvy (1979, p. 32) point out,

Embedded within the mechanistic view of the world are three basic assumptions. The first is that there is a most fundamental level of reality (i.e., the basic building blocks) composed of the smallest particles and the complete set of forces that govern them. Once we find that fundamental level and the laws that govern it, the world laws that govern matter and energy on the very small scale must be very similar, and hopefully identical, to those that apply on the very large scale. The governing laws thus would be universal, so that we ought to be able to build a picture of planets moving about the sun out of an understanding of the particles of which matter is composed. Finally, there is the assumption that we, as observers, can be isolated from experiments and the world we are studying to produce an "objective" description.

A fourth example: Mary Hesse (1980, p. vii), a British epistemologist and historian of science, suggests that what she calls the "stan-

dard account" of scientific explanation within an "empirical philosophy" depends upon a series of assumptions:

The most important of these are the assumptions of *naïve realism*, of a *universal scientific language*, and of the *correspondence theory of truth*.

These three assumptions between them constitute a picture of science and the world somewhat as follows: there is an external world which can in principle be exhaustively described in scientific language. The scientist, as both observer and language-user, can capture the external facts of the world in propositions that are true if they correspond to the facts and false if they do not. Science is ideally a linguistic system in which true propositions are in one-to-one relation to facts, including facts that are not directly observed because they involve hidden entities or properties, or past events or far distant events. These hidden events are described as theories, and theories can be inferred from observations, that is, the hidden explanatory mechanism of the world can be discovered from what is open to observation. Man as scientist is regarded as standing apart from the world and able to experiment and theorize about it objectively and dispassionately.

A fifth example: Hesse (1980, pp. 170-171) also presents a statement of what are taken to be the characteristics of empirical method described by Habermas, who was presumably himself drawing upon the work of Dilthey:

1. In natural science experience is taken to be objective, testable, and independent of theoretical explanation. . . .
2. In natural science theories are artificial constructions or models, yielding explanation in the sense of a logic of hypothetico-deduction: *if* external nature were of such a kind, *then* data and experience would be as we find them. . . .
3. In natural science the lawlike relations asserted of experience are external, both to the objects connected and to the investigator, since they are merely correlational. . . .
4. The language of natural science is exact, formalizable, and literal; therefore meanings are univocal, and a problem of meaning arises only in the application of universal categories to particulars. . . .
5. Meanings in natural science are separate from facts.

A sixth example: Harre (1981, p.3) provides yet another formulation:

The positivist tradition in scientific methodology has been based upon the principle that the only reliable knowledge of any field of phenomena

reduces to knowledge of particular instances of patterns of sensation. Laws are treated as probabilistic generalizations of descriptions of such patterns. The sole role of laws is to facilitate the prediction of future sensory experience. Theories are logically ordered sets of laws. In consequence theories are reduced to a logical apparatus necessary to the business of prediction. It follows that for a positivist, the task of understanding a theory is exhausted by two processes. Analysis of theoretical discourse is aimed at revealing its logical structure. The empirical content of the theory is supposed to be brought to light by identifying those logical consequences of the set of laws which purport to describe observations. There are, therefore, two sides of modern positivism: one logical and one empirical. Modern positivism is sometimes called "logical empiricism."

Harre goes on to raise the question of how it ever happens that positivism gains a foothold. He describes positivism as a kind of fallback position, a "positivist retreat" that occurs whenever there is a serious loss of confidence in current theory in some field. Scientists, he speculates, tend to take their theories and models very seriously, as representations of reality, as factual descriptions of what actually occurs. But, he goes on:

If we are to take an imagined mechanism seriously as a possible representation of reality there ought to be some way of deciding between rival candidates for the role of best explanation. Sometimes the ingenuity of theorists produces a multitude of seemingly possible mechanisms, all capable of being imagined to produce close analogues of the empirically observed patterned regularities. But at the other extreme, it sometimes happens that the most talented and imaginative thinkers can make no headway at all in imagining any mechanism capable of simulating the behaviour of the real world in the field they are investigating. The former situation brought on a positivist reaction among astronomers in the sixteenth century, the latter among subatomic physicists in the twentieth. At the heart of the positivist reaction is a denial that theory could represent hidden realities. According to positivism a science should be taken as no more than a well-attested body of rules for predicting the future course of observation. But these "internal" historical conditions are not sufficient to account for the retreat to positivism. Historical studies clearly reveal an odd twist to this retreat. As scientists abandon the search for a deep knowledge of nature they tend to adopt a militant, even an arrogant posture, sometimes persecuting those who hope to continue on the path of scientific tradition. A kind of glorying in ignorance is displayed, like the Paduan professors who refused to look through Galileo's telescope. Positivist retreats seldom last beyond a single generation of scientists, though the damaging effect of widespread abandonment of

realism can sometimes be felt for a long time after the dominant figures have departed. (Harre, 1981, pp. 7-8)⁷

It is very clear from this sample of statements about positivism that there is no clear agreement about what either the philosophy or the method encompasses. Positivism can be reshaped, apparently, to suit the definer's purpose, and while there is certainly remarkable overlap in these statements there are also some inconsistencies and some idiosyncracies. One might venture to say that the particular form of definition offered by any commentator depends heavily upon the counterpoints he or she wishes to make. (The significance of that observation for the ways in which positivism will be interpreted later in this book should not be overlooked; we are "guilty" of the same "crime.") But it does seem to be the case that these authors do agree on one point: Positivism is passé. Harre's scathing comments noted a few paragraphs ago leave no doubt that he not only disagrees with the positivist position but believes it to be the product of small, confused minds who retreat to it because they lack any other viable alternatives. Such a harsh judgment is undoubtedly a strong overreaction, but hear some more temperate critics:

- Mary Hesse (1980, p. vii) having given it as her opinion that the three most important assumptions underlying positivism are naive realism, belief in a universal scientific language, and a correspondence theory of truth, goes on to comment, "Almost every assumption underlying this account has been subjected to damaging criticism."
- Schwartz and Ogilvy (1979, p. 32), having described what they take to be the three basic assumptions of the Newtonian world view, add that "all of these basic assumptions are now being challenged by theoretical and experimental findings."
- Wolf (1981, pp. 51-56), after describing his view of the assumptions "concerning the physical . . . world" of the Newtonian, comments, "But it would take nearly fifty years for the true [*sic*] story to be told"; with the "end of the mechanical age" coming into view because of certain unexplainable (in positivist terms) phenomena: the inability of physicists to find ether, that necessary component of wave theories of light, and their inability to deal with "the ultraviolet catastrophe," the failure of physicists to explain the colors of heated (glowing) objects.

CHALLENGES TO AND CRITIQUES OF POSITIVISM

What is the nature of the challenges to and critiques of positivism that have brought it to its metaphoric knees? Space precludes the

level of treatment that such a question deserves, but one may point to the following issues:

(1) *Positivism leads to an inadequate conceptualization of what science is:*

- Hesse (1980, pp. 46-47) cites the work of Barry Barnes, who

asserts that all attempts to find demarcating criteria, that is, necessary and sufficient conditions for a belief system to be science, have failed. These failures include all verifiability and falsifiability criteria, and all specific appeals to experimentation and/or to particular kinds of inductive or theoretical inference. At best, he argues, the concept "science" must be regarded as a loose association of family resemblance characteristics involving, among other things, aversion to all forms of anthropomorphism and teleology, and consequent tendencies to secularism, impersonality, abstraction, and quantification.

While it would be inappropriate to argue that this failure is entirely produced by adherence to positivistic principles, it is clear that the paradigm has offered no way out of the dilemma.

- Positivism thoroughly confuses two aspects of inquiry that have often been called the "context of discovery" and the "context of justification." The former deals with the genesis or origin of scientific theories and the latter with testing them. Positivism excludes the former and focuses on the latter. The process of theory conceptualization is seen as noncognitive or nonrational and hence outside the pale. But any theory, no matter how bizarre its origins, is admissible so long as it is coherent (T₁) and testable (T₂). In terms of these constraints, much of Einstein's work, for example, would be considered nonscientific by positivists, who would hardly be persuaded by or interested in Einstein's thought (*gedanken*) experiments.

It may be the case, as Cronbach (1982) seems to suggest, that verification has taken precedence over discovery within positivism because proponents of that formulation could not devise a means for coming to grips with it systematically. He comments:

"Design of experiments" has been a standard element in training for social scientists. This training has concentrated on formal tests of hypotheses—confirmatory studies—despite the fact that R. A. Fisher, the prime theorist of experimental design, demonstrated over and over again in his agricultural investigations that effective inquiry works back and forth between the heuristic and the confirmatory. But since he could offer a formal theory only for the confirmatory studies, *that part came to be taken as the whole.* (pp. ix-x; emphasis added)

- Positivism severely constrains the possible uses or purposes of science to prediction and control. Indeed, what is often called the "pragmatic criterion" of success in science is that it should lead to increasingly successful prediction and control. Such a delimitation forces out of contention other legitimate purposes, as, for example, *verstehen* or understanding, description, problem responses, status determination, and so on. It focuses on what might be called *kennerschaft* to the virtual exclusion of *wissenschaft*.

Of course, none of these reasons are sufficient to lead to discarding positivism, but they are sufficient to lead to an extreme degree of discomfort among practicing scientists who would prefer to have a more solid conceptualization to use as a touchstone.

(2) *Positivism is unable to deal adequately with two crucial and interacting aspects of the theory-fact relationship:*

- *The underdetermination of theory, sometimes also called the problem of induction.* In deduction, given the validity of the premises, the conclusion must be true and it is the only conclusion possible. But in induction, there are always many conclusions that can reasonably be related to certain premises. Deductions are closed but inductions are open. Thus there is always a larger number of theories that can fit observations more or less adequately. Hence there cannot be convergence, no ultimate conclusions, no certain or "true" (T_1) theory. Nor is this situation helped by the fact that there is no agreement about what a theory is (a pattern, network, nomological net, hypothetico-deduction system) or what it is for (to systematize, uncover, predict, explain).
- *The theory-ladenness of facts, that is, the apparent impossibility of having "facts" that are not themselves theory-determined.* It is, many assert, impossible to have an observational language that is not also a theoretical language. The "truth" of propositions (facts on trial) cannot be determined except in relation to a true theory, but, as we have just seen, true theories cannot be derived because of the problem of underdetermination. Hence the reasoning is entirely circular.

(3) *Positivism is overly dependent on operationalism, which has itself been increasingly judged to be inadequate.*

- Operationalism is simply not meaningful or satisfying; recalling the quotation from Ford (see note 5), most people are more interested in fear than in the number of fecal boluses emitted every hour.
- Operationalism is too shallow, depending as it does almost entirely on sensations for its "facts" and refusing to deal with meanings or implications.

- Operationally defined facts are just as theory-laden as are any others.
- Despite the good intentions and the best efforts of the Vienna Circle of Logical Positivists, neither they nor any of their adherents have been able to rid science of its metaphysical underpinnings.
- The strict practice of operationalism results in a meaningless splintering of the world. Since nothing exists for the operationalist except through the instruments that measure it, even such conceptually close entities as two IQ scores measured by two different IQ tests must be asserted to be different *despite* a high correlation between them.

(4) *Positivism has at least two consequences that are both repugnant and unfounded:*

- *Determinism*, repugnant because of its implications for human free will and unfounded because of recent findings in many fields that argue strongly against it, for example, the Heisenberg Uncertainty Principle (Chapter 4).
- *Reductionism*, repugnant because it would make all phenomena including human phenomena ultimately subject to a single set of laws, and unfounded because of recent findings in many fields including mathematics and physics that rule out the possibility in those fields, for example, Gödel's Theorem (Chapter 5).

(5) *Positivism has produced research with human respondents that ignores their humanness, a fact that has not only ethical but also validity implications.*

- It has emphasized *exogenous* research—that is, research in which all aspects of the research, from problem definition through instrumentation, data collection and analysis, and use of findings, have been researcher-determined—to the virtual exclusion of *endogenous* research—that is, research in which the respondents have equal rights of determination.
- It has emphasized *etic* research—that is, research carried out with an outside (objective) perspective—to the virtual exclusion of *emic* research—that is, research carried out with an inside perspective (subjective).

(6) *Positivism falls short of being able to deal with emergent conceptual/empirical formulations from a variety of fields; three examples:*

- Gödel's Incompleteness Theorem, which states that no axiomatic system of mathematics is able to provide information about both the completeness and consistency of that axiomatic system; or, put another way, it asserts that no theory of mathematics asserted to be complete can also be internally consistent.

- Heisenberg's Uncertainty Principle, which asserts that the position and momentum of an electron cannot *both* be determined, because the action of the observer in making either measurement inevitably alters the other.
- Bell's Theorem, which asserts that no theory compatible with quantum theory can require spatially separated events to be independent.

The consequences of these three formulations, as well as others, for the basic premises of positivism, including ontology, objectivity, and causality, are devastating.

(7) *Positivism rests upon at least five assumptions that are increasingly difficult to maintain.* These five assumptions capture the most salient aspects included in the various definitions of positivism that have already been reviewed,⁸ and will form the basis for the counterproposals that are the backbone of this book:

- An ontological assumption of a single, tangible reality "out there" that can be broken apart into pieces capable of being studied independently; the whole is simply the sum of the parts.
- An epistemological assumption about the possibility of separation of the observer from the observed—the knower from the known.
- An assumption of the temporal and contextual independence of observations, so that what is true at one time and place may, under appropriate circumstances (such as sampling) also be true at another time and place.
- An assumption of linear causality; there are no effects without causes and no causes without effects.
- An axiological assumption of value freedom, that is, that the methodology guarantees that the results of an inquiry are essentially free from the influence of any value system (bias).

The consequences of these several critiques of positivism are sufficiently telling and widely appreciated that a significant number of vanguard scientists have abandoned that paradigm and moved into the postpositivist era. We shall describe next what are still clumsy and emergent efforts to carry out that move.

THE POSTPOSITIVIST ERA⁹

Positivism has been remarkably pervasive. We have noted that its precursor era does not have a name of its own but is called, simply, the prepositivist era. Similarly, the new era has not yet gained sufficient credibility or self-assurance to have assumed a name of its own; it too is called by a simple name: postpositivism. The grip of *its* precursor is still on it; it is just as difficult for the modern-day scientist of whatever stripe to throw off the shackles imposed on thinking by

the positivists as it was for Galileo's inquisitors to take his telescope, and what it revealed, seriously; or for Lavoisier's fellow chemists to be able to accept oxygen without simultaneously wondering where all the phlogiston had gone. The reader who has never contemplated postpositivist ideas may be in for a surprise; indeed, a rude shock. As the aphorism goes, "Expect the unexpected."

Perhaps the *most* unexpected aspect of postpositivism is that its basic tenets are virtually the reverse of those that characterized positivism—perhaps not so surprising, after all, when one contemplates that postpositivism is as much a reaction to the failings of positivism as it is a proactive set of new formulations; reaction, too, is a form of "standing on the shoulders of giants."

An example: it will be recalled that Habermas, expanding on the ideas of Dilthey, outlined what he took to be the crucial axiomatic differences between hermeneutics and empiricism. In opposition to what he saw to be the five central aspects of positivism—objectivity, hypothetico-deductive theory, external lawlike relations, exact and formal language, and separation of facts from meaning—Habermas proposed five counterpoints, which Hesse (1980) declares have *now* come to characterize the natural sciences as well. Indeed, she asserts, the positions ascribed by Habermas to the empirical sciences, while valid at the time that he wrote, have been "almost universally discredited" (Hesse, 1980, p. 172). She goes on:

Paralleling the five points of the [Habermas] dichotomy [of natural and human sciences], we can summarize this post-empiricist account of natural science as follows:

1. In natural science data is not detachable from theory, for what count as data are determined in the light of some theoretical interpretation, and the facts themselves have to be reconstructed in the light of interpretation.
2. In natural science theories are not models externally compared in nature to a hypothetico-deductive schema, they are the way the facts themselves are seen.
3. In natural science the law-like relations asserted of experience are internal, because what we count as facts are constituted by what the theory says about their interrelations with one another.
4. The language of natural science is irreducibly metaphorical and inexact, and formalizable only at the cost of distortion of the historical dynamics of scientific development and of the imaginative reconstructions in terms of which nature is interpreted by science.

5. Meanings in natural science are determined by theory; they are understood by theoretical coherence rather than by correspondence with facts. (pp. 172-173)

Objective reality has become very relative indeed!

Another instance: Rom Harre (1981), whose scathing dismissal of positivism was quoted above, also contrasts positivism with the "new paradigm." Where positivism is concerned with surface events or appearances, the new paradigm takes a deeper look. Where positivism is atomistic, the new paradigm is structural. Where positivism establishes meaning operationally, the new paradigm establishes meaning inferentially. Where positivism sees its central purpose to be prediction, the new paradigm is concerned with understanding. Finally, where positivism is deterministic and bent on certainty, the new paradigm is probabilistic and speculative.

Most of the distinguishing features of the postpositivist paradigm have emerged from fields such as physics and chemistry, customarily denoted as the "hard sciences." But the argument for the new paradigm can be made even more persuasively when the entities being studied are human beings.¹⁰ For such research, Heron (1981) advances six arguments in favor of the postpositivist paradigm:

(1) *The argument from the nature of research behavior.* Heron argues that researchers cannot define one model of behavior for themselves and a different one for their respondents. If the basic model for research behavior is that of "intelligent self-direction," then, to be consistent, the same model must be applied to the respondents.

(2) *The argument from intentionality.* Heron (1981, p. 23) argues for the necessity of checking with the respondents to be sure that their intentionality and the researcher's interpretation of it coincide: "When I am interpreting such basic actions [as walking, talking, looking, pointing] in terms of their more complex intentions and purposes, than I need to check against the [respondent's] version of what he was about, for a person may walk, talk, or look or point to fulfill many different higher order intentions."

(3) *The argument from language.* Language formation is interpreted by Heron as an archetype of inquiry itself. When human beings communicate they must agree on the rules of language they will follow. Hence the use of language contains within itself the model of cooperative inquiry. Heron (1981, pp. 26-27) asserts:

I can use the language to make statements about persons who have not contributed or assented to the formulation of those statements. . . . [But]

to use language in this way is to cut it off from its validating base. . . . The result is a set of alienated statements hanging in an interpersonal void: statements about persons not authorized by those persons. . . . My considered view of your reality without consulting you is a very different matter from our considered view of our reality.

(4) *The argument from an extended epistemology.* Heron notes that while science as *product* takes the form of a set of propositional statements, the *process* of scientific inquiry involves not only propositional knowledge but also *practical* knowledge (the skills, proficiencies, or "knacks" of doing research) and *experiential* knowledge (knowing a person or thing through sustained encounters). He notes:

What I am arguing . . . is that empirical research on persons involves a subtle, developing interdependence between propositional knowledge, practical knowledge, and experiential knowledge. The research conclusions . . . necessarily rest on the researcher's experiential knowledge of the [respondents]. This knowledge of persons is most adequate as an empirical base when . . . researcher and [respondent] are fully present to each other in a relationship of reciprocal and open inquiry, and when each is open to construe how the other manifests as a presence in space and time. (p. 31)

(5) *The argument from axiology.* Heron argues that the truth of a proposition depends on shared values. The data that researchers generate, he suggests, depend upon their procedural norms, which in turn depend upon their shared values. If the facts are about persons other than the researchers, "they have indeterminate validity, no secure status as truths, until we know whether those other persons assent to and regard as their own the norms and values of the researchers" (p. 33).

(6) *The moral and political argument.* Research in the conventional sense usually exploits people, Heron asserts, for knowledge is power that can be used against the people from whom the knowledge was generated. The "new paradigm" avoids some of these difficulties because

(1) it honours the fulfillment of the respondents' need for autonomously acquired knowledge; (2) it protects them from becoming unwitting accessories to knowledge-claims that may be false and may be inappropriately or harmfully applied to others; (3) it protects them from being excluded from the formation of knowledge that purports to be about them and so from being managed and manipulated . . . in ways

they do not understand and so cannot assent to or dissent from. (pp. 24-35)

But just what is this new postpositivist paradigm? If we accept that its axioms or assumptions are virtually the inverse of those of positivism, we are not *definitively* helped because, as we have seen, different writers have cast the positivist assumptions in different terms; hence postpositivism's definition depends upon whose positivistic description is followed.

Of course, some scholars insist that postpositivism is nothing more than an overreaction, and that it is time for a rapprochement that realigns positivism with the relativism that characterizes postpositivism. One such writer is Donald T. Campbell, who suggests that it is time to move into a post-postpositivist era, in which positivism and postpositivism are married off and live happily ever after. In his William James Lecture #5, delivered in 1977, for example, he describes science as a *social system*, with all the usual attributes of such a system: norms, jobs, communication channels, modes of recruiting and rewarding members and keeping them loyal, and so on. He says:

But I want to assert that among all these belief-preserving mutual admiration societies, all of which share this common human tribalism, science is also different, with different specific values, myths, rituals, and commandments, and that these different norms are related to what I presume to be science's superiority in the improving validity of the model of the physical world which it carries. . . . In spite of the theory-ladenness and noisiness of unedited experimental evidence, it does provide a major source of discipline in science. . . . The experiment is meticulously designed to put questions to "Nature Itself" in such a way that neither the questioners, nor their colleagues, nor their superiors can affect the answer. . . . In our iterative oscillation of theoretical emphases, in our continual dialectic that never achieves a stable synthesis, we are now ready for a post-post-positivist theory of science which will integrate the epistemological relativism recently achieved with a new and more complex understanding of the role of experimental evidence and predictive confirmation in science. (cited in Brewer & Collins, 1981, pp. 15-16)

Now this whole statement moves from hidden assumptions rooted in the positivist tradition. "Theory-ladenness" and the "noisiness of unedited experimental evidence" are treated as minor technical inconveniences. The place of values in inquiry is ignored and the delu-

sion of objectivity is maintained in claims such as that experiments can be designed meticulously enough so that no one can influence the outcome, only "Nature Itself." But what this perspective misses completely is the fact that postpositivism is not merely a perturbation, a wrinkle, a new angle that simply needs to be accommodated to make everything all right. Postpositivism is an entirely new paradigm, *not* reconcilable with the old. Rapprochements, accommodations, compromises are no more possible here than between the old astronomy and Galileo's new astronomy, between phlogiston and oxygen, between Newtonian and quantum mechanics. We are dealing with an entirely new system of ideas based on fundamentally *different*—indeed, sharply contrasting—assumptions, as the quotations from Mary Hesse, Rom Harre, and John Heron so vividly illustrate. What is needed is a transformation, not an add-on. That the world is round cannot be added to the idea that the world is flat. Nor is the notion of a paradigm transformation simply an intellectual fashion, as Pollie (1983) suggests. To make this point crystal clear, it is worth making a brief digression into the nature of axiomatic systems.

FEATURES OF AXIOMATIC SYSTEMS¹¹

Axioms may be defined as the set of undemonstrated (and undemonstrable) "basic beliefs" accepted by convention or established by practice as the building blocks of some conceptual or theoretical structure or system. They are the statements that will be taken as Truth, in the sense proposed by Julienne Ford. Probably the best known and most widely experienced system of axioms is that undergirding Euclidean geometry. Euclid set himself the task of formalizing what was known about geometry (literally, the measurement of earth or surveying) at his time; essentially, that meant systematizing the rules of thumb used by land surveyors, which had never been "proved" but which everyone knew had validity. It was Euclid's powerful insight that these rules could be "proved" by showing them to be logical derivatives from some simple set of "self-evident" truths; or, to use Ford's terminology, that they could be shown to be T_1 by demonstrating their consistency with the basic beliefs—the self-evident truths—taken to be T_1 . Euclid began with four such basic beliefs, which have since come to be known as the axioms of Euclidean geometry (Hofstadter, 1979):

- (1) A straight line segment can be drawn joining any two points.
- (2) Any straight line segment can be extended indefinitely in a straight line.

- (3) Given any straight line segment, a circle can be drawn having the segment as radius and one end point as center.
- (4) All right angles are congruent.

With these four axioms, Euclid was able to derive ("prove") the first 28 of the eventually much larger set of theorems (statements shown to be T_3), but the twenty-ninth proof he attempted turned out to be intractable. In despair, and driven by the need to go on to other theorems, Euclid finally simply assumed it as a fifth axiom:

- (5) If two lines are drawn that intersect a third in such a way that the sum of the inner angles on one side is less than two right angles, then the two lines inevitably must intersect each other on that side if extended far enough.

The more modern way to state this axiom is as follows: Given a line and a point not on that line, it is possible to construct only one line through the point that is parallel to the given line.

As compared to the first four axioms, the fifth seems strained and inelegant; Euclid was sure that eventually he would be able to find a way of proving it in terms of the first four. But his hope was not to be realized in his lifetime or, indeed, ever; two millennia of effort by mathematicians have failed to provide a proof.

It is now known that a proof in Euclid's sense is impossible, but that fact was hidden from mathematicians' minds during many centuries when assiduous efforts were made to find it. Early attempts at proof were of the form that mathematicians would call *direct*, but, these having failed, *indirect* proof was sought, one variant of which is to assume the *direct opposite* of what one wishes to show and then to demonstrate that this opposite assumption leads to absurd conclusions (theorems). In that case, the original formulation rather than its opposite can be assumed to be correct. It was exactly this approach, however, that culminated in so-called non-Euclidean geometries, for not only were the consequences of non-Euclidean (opposite to Euclidean) axioms not absurd, they were in fact of great utility. One such geometry is called Lobachevskian; this form takes as its fifth axiom, "Given a line and a point not on that line, it is possible to draw a bundle of lines through the point *all of which* are parallel to the given line." Now this axiom flies in the face of all human experience; yet it yields results of great interest, for example, to astronomers.

One of the theorems "provable" (in the sense of T_3) from the Euclidean fifth axiom is that the sum of angles in a triangle is 180° . But

the sum of angles of a Lobachevskian triangle is *not always* 180° but approaches 180° as the triangle becomes "small." An intuitive understanding of this point can be had from examining the (impossible in either geometry but useful for pedagogical purposes) triangle shown in Figure 1.1. Assuming we have a triangle with three angles of 40° , summing to 120° , it is clear that as the triangle is bisected from its 40° superior angle by a perpendicular bisector, each of the smaller triangles now has a sum of angles of 150° . Now of course all human experience argues that triangles *do* have a sum equal to 180° , but that is simply evidence for the fact that, within Lobachevskian geometry, *all earth-size triangles are small*. But astronomically sized triangles are very much larger, and astronomers find that Lobachevskian geometry provides a better "fit" to the phenomena that they investigate than does Euclidean.

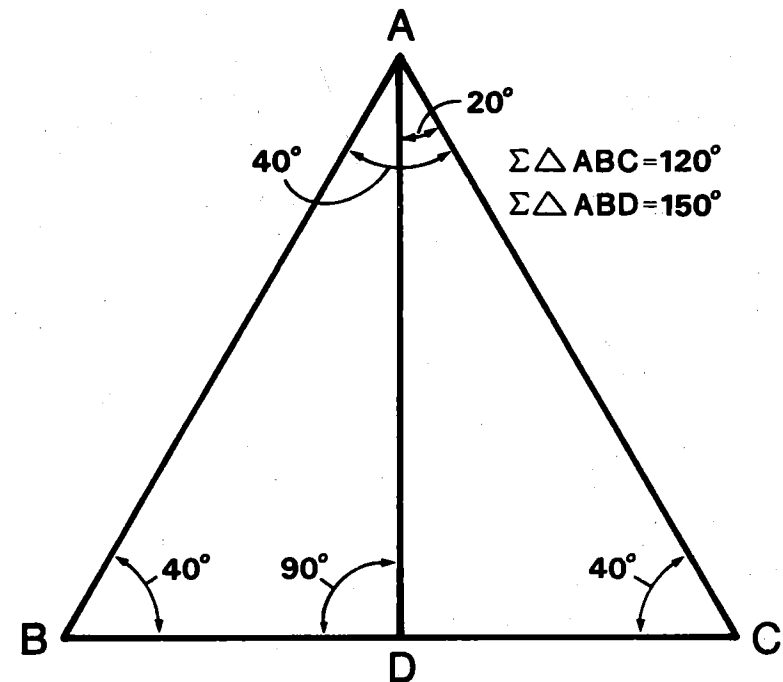


Figure 1.1: Smaller "Lobachevskian" triangles have large sums of angles (approaching 180°).

From this digression we may deduce several crucial points:

- (1) Axioms (basic beliefs) are arbitrary and may be assumed for any reason, even if only for the "sake of the game."
- (2) Axioms are *not* self-evidently true, nor need they appear to be so; indeed, some axioms appear to be very bizarre on first exposure.
- (3) Different axiom systems have different utilities depending on the phenomena to which they are applied. These utilities are *not* determined by the nature of the axiom system itself but by the *interaction* between the axioms and the characteristics of the area of application. Thus Euclidean geometry is fine for terrestrial spaces, but Lobachevskian geometry is preferred for interstellar spaces.
- (4) A decision about which of several alternative axiom systems to use in a given case is best made by testing the "fit" between each system and the case, a process analogous to testing data for fit to assumptions before deciding on which statistic to use in analyzing them.

We are ready now to deal with the axioms of the particular postpositivist paradigm we advocate in this book, which we will term the "naturalistic paradigm." The assumptions of that paradigm are briefly outlined in the next section and are contrasted with those of the positivist paradigm; the question of testing their "fit," particularly for use in human inquiry, is delayed for extended treatment in Chapters 3 through 7. The next section will also provide a preview of some of the methodological implications of the selected paradigm for actually doing research; these implications will be explored in detail in Chapter 8.

THE AXIOMS OF THE NATURALISTIC PARADIGM

We have made the point several times that the particular formulation of the positivistic paradigm that one adopts depends as much upon the counterexample that one will propose as upon anything else; the selection of points is essentially arbitrary. This presentation is not different in that respect; we hope, however, that the reader will agree that, first, we have selected to emphasize more salient rather than more bizarre aspects of positivism, and, second, that we have not misstated the position that a committed positivist would take on these points, whatever might be said about other points. The points of contrast that we have chosen are, we believe, crucial to an understanding of the naturalistic paradigm and the ways in which it differs, contrasts, and even conflicts with the positivistic.

TABLE 1.1 Contrasting Positivist and Naturalist Axioms

<i>Axioms About</i>	<i>Positivist Paradigm</i>	<i>Naturalist Paradigm</i>
The nature of reality	Reality is single, tangible, and fragmentable.	Realities are multiple, constructed, and holistic.
The relationship of knower to the known	Knower and known are independent, a dualism.	Knower and known are interactive, inseparable.
The possibility of generalization	Time- and context-free generalizations (nomothetic statements) are possible.	Only time- and context-bound working hypotheses (idiographic statements) are possible.
The possibility of causal linkages	There are real causes, temporally precedent to or simultaneous with their effects.	All entities are in a state of mutual simultaneous shaping, so that it is impossible to distinguish causes from effects.
The role of values	Inquiry is value-free.	Inquiry is value-bound.

Immediately following is a formal statement of the five axioms in both their naturalistic and positivistic versions; these are also summarized in Table 1.1 for convenience. The reader should here acquaint him- or herself with the axioms and delay concerns about whether these axioms provide a better fit to the phenomena of sociobehavioral inquiry until this matter comes under close scrutiny in later chapters.

Axiom 1: The nature of reality (ontology) (expanded in Chapter 3).

- *Positivist version:* There is a single tangible reality "out there" fragmentable into independent variables and processes, any of which can be studied independently of the others; inquiry can converge onto that reality until, finally, it can be predicted and controlled.
- *Naturalist version:* There are multiple constructed realities that can be studied only holistically; inquiry into these multiple realities will inevitably diverge (each inquiry raises more questions than it answers) so that prediction and control are unlikely outcomes although some level of understanding (*verstehen*) can be achieved.

Axiom 2: The relationship of knower to known (epistemology) (expanded in Chapter 4).

- *Positivist version:* The inquirer and the object of inquiry are independent; the knower and the known constitute a discrete dualism.
- *Naturalist version:* The inquirer and the "object" of inquiry interact to influence one another; knower and known are inseparable.

Axiom 3: The possibility of generalization (expanded in Chapter 5).

- *Positivist version:* The aim of inquiry is to develop a nomothetic body of knowledge in the form of generalizations that are truth statements free from both time and context (they will hold anywhere and at any time).
- *Naturalist version:* The aim of inquiry is to develop an idiographic body of knowledge in the form of "working hypotheses" that describe the individual case.

Axiom 4: The possibility of causal linkages (expanded in Chapter 6).

- *Positivist version:* Every action can be explained as the result (effect) of a real cause that precedes the effect temporally (or is at least simultaneous with it).
- *Naturalist version:* All entities are in a state of mutual simultaneous shaping so that it is impossible to distinguish causes from effects.

Axiom 5: The role of values in inquiry (axiology) (expanded in Chapter 7).

- *Positivist version:* Inquiry is value-free and can be guaranteed to be so by virtue of the objective methodology employed.
- *Naturalist version:* Inquiry is value-bound in at least five ways, captured in the corollaries that follow:

Corollary 1: Inquiries are influenced by *inquirer* values as expressed in the choice of a problem, evaluand, or policy option, and in the framing, bounding, and focusing of that problem, evaluand, or policy option.

Corollary 2: Inquiry is influenced by the choice of the *paradigm* that guides the investigation into the problem.

Corollary 3: Inquiry is influenced by the choice of the *substantive theory* utilized to guide the collection and analysis of data and in the interpretation of findings.

Corollary 4: Inquiry is influenced by the values that inhere in the *context*.

Corollary 5: With respect to corollaries 1 through 4 above, inquiry is either *value-resonant* (reinforcing or congruent) or *value-dissonant* (conflicting). Problem, evaluand, or policy option, paradigm, theory, and context must exhibit congruence (value-resonance) if the inquiry is to produce meaningful results.¹²

Following the naturalistic rather than the positivistic version of these key axioms has, as one might expect, enormous implications for the *doing* of research; these implications are very briefly sketched in the following section and will be pursued in more detail subsequently.

IMPLICATIONS FOR THE DOING OF RESEARCH

An inquirer doing research in the style or mode of the naturalist paradigm needs more than just the five axioms listed above as guides. In this section we shall describe very briefly some of the more important implications of the paradigm for actual research operations. The importance of these modes will be more fully appreciated as we return to them in more depth in Chapter 8.

We shall describe fourteen characteristics of operational naturalistic inquiry. These characteristics can be justified in two ways: (1) by their logical dependence on the axioms that undergird the paradigm, and (2) by their coherence and interdependence. These fourteen characteristics display a synergism such that, once one is selected, the others more or less follow. Some attempt will be made in the paragraphs that follow to support these claims.

Logical Dependence upon the Axioms

Characteristic 1: Natural setting. N (the naturalist) elects to carry out research in the natural setting or context of the entity for which study is proposed because naturalistic ontology suggests that realities are wholes that cannot be understood in isolation from their contexts, nor can they be fragmented for separate study of the parts (the whole is more than the sum of the parts); because of the belief that the very act of observation influences what is seen, and so the research interaction should take place with the entity-in-context for fullest understanding; because of the belief that context is crucial in deciding whether or not a finding may have meaning in some other context as well; because of the belief in complex mutual shaping rather than linear causation, which suggests that the phenomenon must be studied in its full-scale influence (force) field; and because contextual value structures are at least partly determinative of what will be found.

Characteristic 2: Human instrument. N elects to use him- or herself as well as other humans as the primary data-gathering instruments (as opposed to paper-and-pencil or brass instruments) because it would be virtually impossible to devise a priori a nonhuman instrument with sufficient adaptability to encompass and adjust to the variety of realities that will be encountered; because of the understanding that all instruments interact with respondents and objects but that only the human instrument is capable of grasping and evaluating the meaning of that differential interaction; because the intrusion of instruments intervenes in the mutual shaping of other elements and that shaping

can be appreciated and evaluated only by a human; and because all instruments are value-based and interact with local values but only the human is in a position to identify and take into account (to some extent) those resulting biases.¹³

Characteristic 3: Utilization of tacit knowledge. N argues for the legitimization of tacit (intuitive, felt) knowledge in addition to propositional knowledge (knowledge expressible in language form) because often the nuances of the multiple realities can be appreciated only in this way; because much of the interaction between investigator and respondent or object occurs at this level; and because tacit knowledge mirrors more fairly and accurately the value patterns of the investigator.

Characteristic 4: Qualitative methods. N elects qualitative methods over quantitative (although not exclusively) because they are more adaptable to dealing with multiple (and less aggregatable) realities; because such methods expose more directly the nature of the transaction between investigator and respondent (or object) and hence make easier an assessment of the extent to which the phenomenon is described in terms of (is biased by) the investigator's own posture; and because qualitative methods are more sensitive to and adaptable to the many mutually shaping influences and value patterns that may be encountered.

Characteristic 5: Purposive sampling. N is likely to eschew random or representative sampling in favor of purposive or theoretical sampling because he or she thereby increases the scope or range of data exposed (random or representative sampling is likely to suppress more deviant cases) as well as the likelihood that the full array of multiple realities will be uncovered; and because purposive sampling can be pursued in ways that will maximize the investigator's ability to devise grounded theory that takes adequate account of local conditions, local mutual shapings, and local values (for possible transferability).

Characteristic 6: Inductive data analysis. N prefers inductive (to deductive) data analysis because that process is more likely to identify the multiple realities to be found in those data; because such analysis is more likely to make the investigator-respondent (or object) interaction explicit, recognizable, and accountable; because this process is more likely to describe fully the setting and to make decisions about transferability to other settings easier; because inductive data analysis is more likely to identify the mutually shaping influences that interact; and because values can be an explicit part of the analytic structure.

Characteristic 7: Grounded theory. N prefers to have the guiding substantive theory emerge from (be grounded in) the data because *no* a priori theory could possibly encompass the multiple realities that are likely to be encountered; because believing is seeing and N wishes to enter his transactions with respondents as neutrally as possible; because a priori theory is likely to be based on a priori generalizations, which, while they may make nomothetic sense, may nevertheless provide a poor idiographic fit to the situation encountered (the fact that a woman recounts a set of gynecological symptoms to her doctor that, in 80 percent of patients, indicates cervical cancer is not sufficient reason to schedule her for surgery without examination to determine whether she might not be one of the 20 percent); because the mutual shapings found in a particular context may be explicable only in terms of the contextual elements found there; and because grounded theory is more likely to be responsive to contextual values (and not merely to investigator values).

Characteristic 8: Emergent design. N elects to allow the research design to emerge (flow, cascade, unfold) rather than to construct it preordinately (a priori) because it is inconceivable that enough could be known ahead of time about the many multiple realities to devise the design adequately; because what emerges as a function of the interaction between inquirer and phenomenon is largely unpredictable in advance; because the inquirer cannot know sufficiently well the patterns of mutual shaping that are likely to exist; and because the various value systems involved (including the inquirer's own) interact in unpredictable ways to influence the outcome.

Characteristic 9: Negotiated outcomes. N prefers to negotiate meanings and interpretations with the human sources from which the data have chiefly been drawn because it is their constructions of reality that the inquirer seeks to reconstruct; because inquiry outcomes depend upon the nature and quality of the interaction between the knower and the known, epitomized in negotiations about the meaning of data; because the specific working hypotheses that might apply in a given context are best verified and confirmed by the people who inhabit that context; because respondents are in a better position to interpret the complex mutual interactions—shapings—that enter into what is observed; and because respondents can best understand and interpret the influence of local value patterns.

Characteristic 10: Case study reporting mode. N is likely to prefer the case study reporting mode (over the scientific or technical report) because it is more adapted to a description of the multiple realities encountered at any given site: because it is adaptable to demonstrating

the investigator's interaction with the site and consequent biases that may result (reflexive reporting); because it provides the basis for both individual "naturalistic generalizations" (Stake, 1980) and transferability to other sites (thick description); because it is suited to demonstrating the variety of mutually shaping influences present; and because it can picture the value positions of investigator, substantive theory, methodological paradigm, and local contextual values.

Characteristic 11: Idiographic interpretation. N is inclined to interpret data (including the drawing of conclusions) idiographically (in terms of the particulars of the case) rather than nomothetically (in terms of lawlike generalizations) because different interpretations are likely to be meaningful for different realities; and because interpretations depend so heavily for their validity on local particulars, including the particular investigator-respondent (or object) interaction, the contextual factors involved, the local mutually shaping factors influencing one another, and the local (as well as investigator) values.

Characteristic 12: Tentative application. N is likely to be tentative (hesitant) about making broad application of the findings because realities are multiple and different; because the findings are to some extent dependent upon the particular interaction between investigator and respondents (or object) that may not be duplicated elsewhere; because the extent to which the findings may be applicable elsewhere depends upon the *empirical* similarity of sending and receiving contexts; because the particular "mix" of mutually shaping influences may vary markedly from setting to setting; and because value systems, especially contextual values, may be sharply at variance from site to site.

Characteristic 13: Focus-determined boundaries. N is likely to set boundaries to the inquiry on the basis of the emergent focus (problems for research, evaluands for evaluation, and policy options for policy analysis) because that permits the multiple realities to define the focus (rather than inquirer preconceptions); because focus-setting can be more closely mediated by the investigator-focus interaction; because boundaries cannot be satisfactorily set without intimate contextual knowledge, including knowledge about the mutually shaping factors involved; and because foci have no meaning in any event in abstraction from the local investigator value systems.

Characteristic 14: Special criteria for trustworthiness. N is likely to find the conventional trustworthiness criteria (internal and external validity, reliability, and objectivity) inconsistent with the axioms and procedures of naturalistic inquiry. Hence he or she is likely to define

new (but analogous) criteria and devise operational procedures for applying them. Chapter 11 is devoted to this matter; here it is worth noting that the conventional criterion of internal validity fails because it implies an isomorphism between research outcomes and a single, tangible reality onto which inquiry can converge; that the criterion of external validity fails because it is inconsistent with the basic axiom concerning generalizability; that the criterion of reliability fails because it requires absolute stability and replicability, neither of which is possible for a paradigm based on emergent design; and that the criterion of objectivity fails because the paradigm openly admits investigator-respondent (or object) interaction and the role of values. The case will later be made that there exist substitute criteria (called credibility, transferability, dependability, and confirmability) together with corresponding empirical procedures that adequately (if not absolutely) affirm the trustworthiness of naturalistic approaches.

Coherence (Mutual Reinforcement) Among the Characteristics

A second justification for claiming that the above list of fourteen characteristics is justifiable for naturalistic inquiry is the fact that they display a remarkable coherence and interdependence. One simple illustration will suffice to make the point that each may be taken as a *raison d'être* for the others; and that the exclusion of any one of them would seriously damage all.

In doing research from a naturalistic perspective, N is forced into the natural setting because he or she cannot specify, without an *a priori* theory or hypothesis, what is important to control or even to study. Until N has spent some time in the setting he or she cannot specify the focus (problem, evaluand, or policy option) in more than rudimentary form, or place boundaries on it. N could not design a contrived study (an experiment, say) because he or she would not know what to contrive. If theory is to be grounded in data, those data must first be located and analyzed inductively. Since N cannot specify the precise form of the data to be sought, he or she must fall back on an open-ended adaptive instrument: the human being, who, like the "smart bomb," can identify and wend its way to (purposefully sample) the target without having been precisely preprogrammed to strike it. Humans find certain data collection means more congenial than others; they tend toward the use of qualitative methods that "extend" human senses: seeing, hearing, and tacit "sixth-sensing" that lead one to observation, interview, documentary analysis, and the like. These methods results in insights and information about the sending context so that the extent of transferability and applicability in some other receiving

context may be judged. No aggregations, no generalizations, no cause-effect statements can emerge, but only idiographic interpretations negotiated with knowledgeable respondents; hence an air of tentativeness surrounds any proposed application. Finally, the case study mode lends itself well to the full description that will be required to encompass all of these facets and make possible understanding on the part of a reader (building on his or her own tacit knowledge and making "naturalistic generalizations" possible). Judgments about the trustworthiness of such a process cannot be made with conventional criteria; criteria devised especially for and demonstrably appropriate to naturalistic inquiry are required.

AN OVERVIEW

The remainder of this volume is devoted to a fuller explication of the ideas that have been introduced so sketchily in this chapter. Chapter 2 is an effort to provide further legitimation for the naturalistic paradigm by showing its resonance with a more encompassing new "paradigm of thought and belief" that draws upon *substantive* (rather than merely methodological) vanguard ideas from a wide variety of disciplines. Chapters 3 through 7 deal in more detail with each of the five axioms—reality, knower-known interaction, generalizability, causality, and values—and make the case that the naturalistic version of these axioms provides a better fit to sociobehavioral phenomena at least, if not to all phenomena. Chapter 8 deals in more detail with the first thirteen of the fourteen characteristics listed in this chapter, and closes out the first and more theoretical part of the book.

Beginning with Chapter 9, we attempt to provide more practical guidelines for the actual *doing* of naturalistic inquiry. That chapter discusses the design of a naturalistic study (although, as the reader can guess, the term "design" will be found to have a somewhat different meaning than is conventionally the case). Chapter 10 gives directions for actually carrying through a design. Chapter 11 returns to the theme of trustworthiness techniques. Chapter 12 outlines the procedures for inductive data processing, and Chapter 13 for writing the case study and closing out the inquiry with a general member check and audit.

NOTES

1. The concept of "preservation of appearances" was common in medieval and early positivist periods.

2. The wisdom of taking T_1 on faith (as one often must) is called into question by the frequency with which it is discovered that one or another well-known scientist has "fudged" the data.

3. We are aware that this definition of *paradigm* is not that which scientists customarily use, that is, a model or pattern (as for example, a paradigm equation that illustrates the procedures for solving an entire class of equations). It is, however, consistent with the use of that term by Kuhn (1970) and others who have written in a similar vein about "paradigm revolutions."

4. A serious question can be raised whether any theory that aims at comprehensiveness can also be perfectly coherent. Gödel's Theorem in mathematics suggests that a comprehensiveness/coherence union is in principle impossible. See the excellent discussion in Hofstadter (1979).

5. We cannot resist citing a memorable paragraph from Julianne Ford (1975, p. 149), who, in describing operationism in terms of the concepts of Percy W. Bridgman, a staunch advocate, says:

Bridgman's argument is quite simply that to be meaningful a variable must be defined in terms of the measurement operation that would be involved in detecting it in reality. This view is usually termed *operationism* (though it is sometimes referred to as *operationalism*) and it amounts to the methodological assertion that any variable which cannot be directly represented by a measurement operation has no place in science. Thus a hypothesis like "*Those rabbits will be afraid*" is regarded as meaningless. However, the statement, "*Those rabbits will be seen to be emitting more faecal boluses per hour than is normal for rabbits*" is perfectly meaningful as far as Bridgman and his men are concerned. Fear, then, is meaningless to the operationist but an observably increasing defecation rate does have meaning. (Notice incidentally that Cockneys seem to think that Bridgman has a point: The Cockney rarely says "Huck is afraid", instead he says "Huck is shitting himself".)

6. This same metaphor also served David Hume in his critique of the concept of causality. See Chapter 6.

7. Harre's reference to the "Paduan professors who refused to look through Galileo's telescope" is a famous instance of what might be called the "reluctant mind," the mind that refuses to accept the need for a new paradigm and that capitalizes on what we earlier termed the "loose coupling" of theory. Galileo, it will be recalled, had gotten himself into trouble with the Church (it was only in 1983 that the Church admitted having committed a major blunder in Galileo's case; *Time*, May 23, 1983, p. 58) because of his publications outlining a heliocentric universe, a formulation clearly at odds with the Church's position that the universe was geocentric. Ordered to an inquisition in 1633, he was censured and actually condemned to death, although the sentence was suspended in view of his abject recantation. But prior to the official "hearing," Galileo was visited in Padua by a group of inquisitors, composed (to the eternal shame of all academics) mainly of professors from the nearby university. According to the story, which may well be apocryphal, Galileo invited his visitors to look through his telescope at the moon and see for themselves the mountains and the craters that the marvelous instrument revealed for the first time. But his inquisitors refused to do so, arguing that whatever might be visible through the telescope would be a product not of nature but of the instrument. How consistent this position is with Aristotelian "naturalism"! Galileo's active intervention in building the telescope and viewing the moon through it were, to the inquisitors' prepositivist minds, an exact illustration of how the *active* observer could distort the "real" or "natural" order. Their posture was perhaps not so much a "glorying in ignorance," as Harre claims, but adherence to the best "scientific" principles of the time.

Another example of the fact that even the best thinkers of an era may have difficulty in throwing off the constraints imposed by the paradigm they follow can be found in the conversion of the field of chemistry from a phlogiston-based theory of combustion and calcination to an oxygen-based theory. The oxygen theory seemed to offer a better explanation of these two phenomena than did the phlogiston theory/and, indeed, offered an explanation of several other phenomena that had not been contemplated by the phlogiston theories: respiration and acidity. Chemists steeped in the phlogiston theory were accustomed to working with equations that included terms for either the absorption or emission of phlogiston. When Lavoisier provided a variety of evidence in support of the oxygen theory, many chemists were prepared to accept his formulation but stumbled over one crucial issue: What happened to the phlogiston in Lavoisier's equations? They could not understand that the very concept of phlogiston was foreign to the paradigm being offered by Lavoisier; that it did not require explanation in the new paradigm, that the construction of the new paradigm denied phlogiston's existence. For an instructive treatment of this important piece of chemical history, see McCann (1978).

8. The reader should recall at this point our earlier caveat about describing the positivist paradigm in terms that best accommodate the rebuttal or counterproposal that the critic intends to make.

9. The reader should be aware that we use the term "postpositivist" to refer to paradigms that represent genuine breaks with the positivist tradition. A substantial number of writers who refer to their own work using this phrase are, in our terms, only neopositivists. They have attempted to respond to criticisms of positivism by making adjustments or accommodations, not by radical revision. They represent modern-day counterparts of the "reluctant minds" that we have already encountered in our description of the "Paduan professors" or the phlogiston-oriented chemists. We shall return to this theme repeatedly throughout this book.

10. One notable difference between conventional and emergent paradigms can be detected in the terminology common to each to describe human entities being studied. Positivists tend to call them "subjects," or even "objects of inquiry," treating them as though they were equivalent to the inanimate objects encountered in physics and chemistry. We prefer to call them "respondents," a term that not only retains their humanness but reminds us of the interactive character of human inquiry.

11. The language of this and the following section follows closely Guba and Lincoln (1982).

12. This assertion is one of the most central in this book. If it were not the case that these various value aspects could be resonant or dissonant, one need not be too concerned about which paradigm was being used in any particular inquiry. But it is precisely because the foci of modern inquiry and the substantive theories used in their study may rest on assumptions that are inconsistent with those of the positivist paradigm that it is imperative to move to a paradigm that *is* resonant. The fact that the emergent substantive theories in virtually all disciplines are better supported by the naturalist paradigm will be argued in Chapter 2.

13. Hofstadter (1979) points out that adaptability and perfectability stand in a trade-off relationship to one another. The more perfect an instrument is for some specific purpose, the less adaptable it must be for other purposes. The human, while far from perfect as an instrument, is nevertheless infinitely adaptable.

2

Is the Naturalistic Paradigm the Genuine Article?

It seems well-nigh unethical at present to allow . . . case studies of this nature.

(Campbell & Stanley, 1963)

GROWING LEGITIMATION

It must be evident to the reader that accepting the naturalistic paradigm involves a good deal more than a simple accommodation in one's previous thinking. It is in fact a *revolutionary* move; revolutions, unless one is convinced beyond a shadow of a doubt of their necessity, ought to be stoutly resisted. Why should anyone accept the naturalistic paradigm as a logical successor to the positivist point of view? Positivism may have its faults; why should the mantle of legitimation fall on the shoulders of naturalism?

The answer to that question is complex; indeed, the question can be addressed at a variety of levels. At one level, it may be supposed that the entire approach should be dismissed out of hand because of the well-known objections to the "one-shot case study design" so roundly scored by Campbell and Stanley (1963, p. 177):

Such studies often involve tedious collection of specific detail, careful observation, testing, and the like, and in such instances involve the error of misplaced precision. How much more valuable the study would be if the one set of observations were reduced by half and the saved effort directed to the study in equal detail of an appropriate comparison instance. It seems well-nigh unethical at present to allow, as theses or dissertations in education, case studies of this nature.

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