

EVOLUTION'S FIRST PHILOSOPHER

JOHN DEWEY AND THE

CONTINUITY OF NATURE

JEROME A. POPP

Evolution's First Philosopher

SUNY series in Philosophy and Biology

David Edward Shaner, editor

EVOLUTION'S FIRST PHILOSOPHER

John Dewey and the Continuity of Nature



JEROME A. POPP

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To Professor Marcia Susan Brown-Popp

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Reading Guide

John Dewey was the first philosopher to see in Darwin's thesis the basis for developing a naturalistic theory of meaning, including a naturalized theory of value. Interpreters and critics alike see Dewey's thought as a significant attempt at the development of a naturalized philosophy, but their lack of attention to evolutionary theory limits their understanding of how Dewey achieved this naturalization.

Anyone who has read Dewey's boosters or detractors over the years knows that the concept of 'democracy' is almost always given center stage. This is a debilitating mistake. To ignore the Darwinian nature of Dewey's arguments is to get the impression that it is his basic purpose to articulate and justify a conception of democracy as morality. When Dewey is read with this belief in mind, the revolutionary epistemological significance of Dewey's thought is lost.

The basic tenets of positivism and logical empiricism emphasized controlled observation and attention to the formal logical structure of our knowledge. This approach to epistemology tended to screen off Dewey's arguments, which emphasized neither controlled observation nor formal structure, thus, making them appear loose and incomplete by logical empiricistic standards. This produced a rather strange crossover in philosophic history. Dewey's appeal to evolution as a basis for developing a naturalized theory of meaning is an appeal to the most comprehensive of scientific theories, one supported by evidence from numerous and divergent scientific fields; yet the analyses Dewey produced were ignored by the philosophers of science of his day. On Dewey's behalf, we should note that much of today's epistemology is centered on evolutionary theory because of its explanatory power, as, for example, Daniel Dennett's writings reveal (2005; 2003; 1995; 1991).

Chapter 1 is a general introduction to the relationship between philosophy and evolution, including a contrasting of Dewey's attitude toward Darwin

with that of one of the great 20th-century logicians, Bertrand Russell. The idea of genetic determinism is briefly reviewed since many mistakenly believe that the philosophic analysis of Darwinism must lead to some type of determinism. It is suggested that the ultimate form of naturalism is one that is grounded in evolutionary science.

Since all readers may not be aware of the most recent thinking in this area of research, the three chapters of part 1 present a review of key scientific concepts and relationships. Readers who feel that they already understand this content may want to go from chapter 1 to chapter 5. Before you make this decision, consider the following brief descriptions of each of these three chapters.

Chapter 2 is an overview of evolution theory. It is necessary that readers have a thorough understanding of the concept of 'natural selection,' as it forms the basis of a naturalized approach to morality. In addition, this chapter describes Richard Dawkins' argument that in evolution it is the genome (the set of chromosomes) that is under selection pressure, not the individual organism. Readers who are familiar with this material should consider moving on to chapter 3.

Chapter 3 presents Dewey's analysis of innate behaviors, what he calls "unlearned activities." This analysis is essential for understanding all of Dewey's writings, as will be shown in various places below. Following Dewey's analysis of innateness, Dennett's thesis about the genetic origins of our impulses is presented. This chapter also shows how the preparedness-plasticity distinction is a replacement for the old and contentious nature-versus-nurture issue. Of particular interest to epistemologists is the discussion in which Kant's synthetic a priori categories are analyzed in terms of the preparedness-plasticity distinction, and natural selection.

Chapter 4 reviews recent thinking in brain science and the evolution of mind. This research shows that the brain has the actual physical ability to modify its form in response to the environment in which newborn children find themselves. Dawkins' notion of memes is presented as an essential element in Dennett's view of the development of mindedness, which he argues is a serial processor that runs on our parallel-processing brains. Readers unfamiliar with Dennett's view of mind may want to skip over the other sections of this chapter and go directly to the last section.

The three chapters dealing with scientific background (2, 3, and 4) are included to make this book more accessible to readers who have not followed all of the recent attention to evolution in the philosophic literature and to entice those readers interested in evolutionary science who have not as yet seen Dewey as an important philosopher for the 21st century. These three chapters are also included to show readers that scientific studies of the origins of cognition can be an impetus for developing new perspectives on old philosophic questions.

The three chapters that constitute part 2 present a new analysis of Dewey's thought. Chapter 5 argues that intellectual growth, not democracy, is the logical center of Dewey's arguments. However, to grasp the validity of this claim, one must see Dewey's naturalism in evolutionary terms. Fortunately for our understanding of Dewey, the revolution in biology of the last three decades presents us with additional resources to bring to bear on his work. In addition, Dennett's intensive analyses of how evolutionary theory relates to epistemology and morality gives us another way to understand Dewey as a philosopher of evolution.

Once this fundamental epistemological argument of Dewey's is understood, attention in chapter 6 will turn to his analysis of democracy, with the inclusion of an older, but recently widely discussed dimension of evolutionary theory, the Baldwin effect. Chapter 7, reconsiders progressive liberalism in light of the understandings emerging from Dewey's evolutionary-theory-based naturalism.

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ONE

Evolution and Philosophy

Doubtless the greatest dissolvent in contemporary thought of old questions, the greatest precipitant of new methods, new intentions, new problems, is the one effected by the scientific revolution that found its climax in the *Origin of Species*.

—John Dewey (M4:14)



John Dewey was the first philosopher to recognize that Darwin's thesis about natural selection not only required us to change how we think about ourselves and the life forms around us but also required a markedly different approach to philosophy. While other philosophers may have given some attention to evolutionary theory, it was Dewey alone who saw that if the mind emerged from earlier mindless forms, then this fact portended a new account of knowledge, ethics, and democracy.

INTRODUCTION

The discontinuous mind is ubiquitous.

—Richard Dawkins, *A Devil's Chaplain* (2004:21)

WHILE THERE IS CURRENTLY considerable interest in the relationship between evolution and philosophy, the contributions of John Dewey to the advancement of philosophy continue to go unnoticed and, a fortiori, unappreciated. Darwin's

explanations give Dewey both the impetus and the cognitive *locus standi* to reconsider the content and methods of traditional philosophy. Dewey argues that Darwin's thesis shows us that the pre-Darwinian search for an adequate account of epistemology and ethics without regard for, or in the explicit rejection of, science is no longer acceptable philosophic practice. Dewey's writings present the development and use of naturalized analytical methods to reconstruct the problems and proposed solutions of traditional philosophy. When the Darwinian basis of Dewey's thought is revealed and contrasted with recent work in cognitive science, one can see that Dewey's arguments are quite relevant to the philosophic thought of the 21st century, especially the pursuit of a naturalistic theory of meaning.

Several writers concerned with evolution or philosophic naturalism mention Dewey and other pragmatists, but they do not develop their arguments, which are significant for understanding the philosophic consequences of Darwinism. For example, Suzanne Cunningham gives a penetrating analysis of how several philosophers thought about Darwin's thesis, but she mentions Dewey only briefly in the introduction to her book, *Philosophy and the Darwinian Legacy* (1996:5). Kitcher, in his helpful book-length analysis of naturalism, "The Naturalists Return," *Philosophical Review* (1992), except for a footnote, passes over anything Dewey has to say about naturalism. For the philosophic naturalists to attempt a return, without bringing Dewey's initiating ideas about the evolutionary origins of that naturalism with them, is to fail to appreciate the significance of Dewey's analyses. As will be shown in later chapters, the most important aspects of Dewey's arguments are going unnoticed (with the important exception of Daniel Dennett), because Dewey is not being seen as first and foremost a Darwinist.

Dennett has recently argued that any adequate account of human capacities must include evolutionary explanations of how humans came to possess these capacities (2003b). It may be possible to give historical accounts of how humans developed, but unless these accounts are based upon sound evolutionary explanations, they are inadequate. Furthermore, attempts to understand or evaluate any philosophic account proffered as a naturalized theory of ethics must attend to more than simply the appeal to scientific conclusions claimed to be relevant to these moral theses, because there are certain issues concerning the origins of humanity and human intelligence that must be adequately formulated to develop an acceptable account of naturalized morality. To be precise, any account of naturalized morality must *identify* those aspects of Nature that give rise to *specific moral conclusions* for which *justifying* arguments are adduced for those conclusions. It is the thesis of this book that Dewey has solved these problems in a most elegant fashion.

DARWIN'S INFLUENCE ON DEWEY

I took the one less traveled by,
And that has made all the difference.

—Robert Frost, *The Road Not Taken*

Charles Darwin published *The Origin of Species* in 1859, the year of Dewey's birth. During his junior year as a student at the University of Vermont, Dewey was enrolled in a physiology course in which he read Thomas Henry Huxley's (1825–1895) textbook (E1:ix). Since Huxley was known as Darwin's bulldog, because he passionately and vociferously advocated and defended Darwin's thesis, we can conclude that Dewey was well-versed in the intricacies of the theory of evolution early in his career. At the age of twenty-four, Dewey published his investigation of this theory for its potential as a new method of philosophic analysis. In that paper, "Knowledge and the Relativity of Feeling," Dewey observes, "with the development of the theory of evolution arose a school that wielded a mightier weapon" (E1:20).

Prior to the publication of *The Origin of Species*, philosophy embraced a kind of purposeful absolutism. Whether it came from a type of supernaturalism or a secular idealism, the belief was that, as Dewey says, "In all living forms, a specific type is present, directing the earlier stages of growth to the realization of its own perfection" (M4:8). This is the argument from design. The changes we observe in the things around us are the result of an ideal force "working out its own ultimate manifestation," which is the completeness of the design. And as Dewey further points out, since this design or ideal force is not observable, it was thought to be accessible only through reason. "The Darwinian principle of natural selection cut straight under this philosophy" (M4:9).

Today the expression is that Darwin showed us how there can be design in the world of living things without there having been a designer. The view of knowledge to which both Darwin and Dewey are objecting holds that knowledge is a grasp of that which is eternal and unchanging in the universe. On this view, observable change is taken to be positive evidence, in that it reveals to us the ideal or design in action. "If all organic adaptations are due simply to constant variation and the elimination of those variables which are harmful in the struggle for existence that is brought about by excessive reproduction, there is no call for a prior intelligent causal force to plan and preordain them" (M4:9).

Today, DNA evidence is as much a part of the prosecution of violent crimes as were fingerprints in earlier times. One need know nothing of biology or genetics to believe that from the smallest piece of tissue it is possible to attain a person's genetic fingerprint. When Dewey was writing, the discov-

ery of DNA was yet to be achieved, as he died in 1952, one year before Frances Crick and James Watson discovered the structure of DNA.

Dewey was the first philosopher to grasp fully the significance of the changes required by what would thereafter be seen as an adequate scientific explanation.

No one can fairly deny that at present there are two effects of the Darwinian mode of thinking. On the one hand, they are making many more sincere and vital efforts to revise our traditional philosophic conceptions in accordance with its demands. On the other hand, there is as definitely a recrudescence of absolutistic philosophies; an assertion of a type of philosophic knowing distinct from that of the sciences, one which opens to us another kind of reality from that to which the sciences give access; an appeal through experience to something that essentially goes beyond experience. (M4:13–14)

Many of Dewey's writings are aimed at the revision of traditional philosophic conceptions. He, like Dennett after him, was spurred on by the question of what Darwin's discovery means for philosophy. "The very conquest of the biological sciences by the new ideas has led many to proclaim an explicit and rigid separation of philosophy from science" (M4:14). Dewey's rejection of this separation, both here and in his other writings, reveals his philosophic naturalism. Consider the following conclusion drawn by Dewey.

The significance of the evolutionary method in biology and social history is that every distinct organ, structure, or formation, every grouping of cells or elements, is to be treated as an instrument of adjustment or adaptation to a particular environing situation. Its meaning, its character, its force, is known when, and only when, it is considered as an arrangement for meeting the conditions involved in some specific situation. This analysis is carried out by tracing successive stages of development—by endeavoring to locate the particular situation in which each structure has its origin, and by tracing the successive modifications through which, in response to changing media, it has reached its present conformation. . . . To persist in condemning natural history from the standpoint of what natural history meant before it identified itself with evolutionary process is not so much to exclude the natural history standpoint from philosophic consideration as it is to evince ignorance of what it signified. (M2:310)

When we consider Dewey's role in this story, we will see that Dewey is the first to recognize a point made by Dennett that Darwin's explanation of life is a study in biological engineering. He was, in fact, extending the Darwinian engineering account by further developing the philosophy of biology.

How could this be so? Dewey's analyses of "growth"—efforts for which he is often misunderstood—can be seen, without exaggeration, as analyses within the continued study of the evolution of intelligence. This thesis will be presented in chapter 5.

RUSSELL'S REJECTION OF EVOLUTION

If mathematical thinking is defective, where are we to find truth and certitude?

—David Hilbert (1964:141)

Cunningham (1996) presents a good analysis of how several important philosophers viewed Darwin's theory. The focus here is on Bertrand Russell because he and Dewey were friends who kept track of each other's work and freely criticized each other. Lord Russell gives several reasons why he rejects what he calls "evolutionism." While he grants that evolution does explain early morality, and, along with education, the development of conscience, he holds that Darwin's struggle for existence is now over, because of the state of technological development. One might say the old rules have changed, now that we are free from want. For Russell, ethics need not be concerned with issues involving individual or group survival. Looking to evolution for ethical insights obscures the point that ethics is based on reason, which is beyond evolutionary explanation. As Cunningham puts it,

Russell's insistence that reasoned morality is independent of all evolutionary factors reveals the extreme narrowness of his view of the struggle for existence. He sees an ethics that originates in evolutionary considerations as having the maxim, "Kill or be killed," progressing later to hypocrisy and priggery. His view of the struggle for existence is framed as the war of all against all. One might think that Russell simply never read Darwin's discussion of the struggle for existence in *The Origin of Species* or his discussion of morality in *Descent of Man*. (1996:62)

She goes on to say that Russell had listed these two books among those that he had read. Russell raises several sociopolitical objections to evolution theory, one of which is that Darwinism is "bellicose and imperialistic" (Cunningham, 1996:67). Russell sees the theory "as generally accepted" and, in a footnote, directs the reader to Julian Huxley's *Evolution: A Modern Synthesis*. He continues:

But the particular motive force which Darwin suggested, namely the struggle for existence and the survival of the fittest, is not nearly so popular among biologists as it was fifty years ago. Darwin's theory was an extension,

to the whole of life, of *laissez-faire* economics; now that this kind of economics, and its associated politics, are out of fashion, people prefer other ways of accounting for biological changes. Where such changes have already occurred in part of a given stock, the Darwinian mechanism is still allowed to explain why one side gets the victory in a contest between the mutants and the conservatives. But whereas the earlier Darwinians thought that minute changes occurred, by selection, in each generation, the modern Mendelians lay stress on comparatively large changes occurring only occasionally, and their hope is to find a more or less mechanical theory as to the origin of such changes. The experimental altering of genes by X-rays gives hope of progress in this direction. (Russell, 1948:43)

We can see, as Cunningham points out, that Russell seems to have come to the belief that mutant theory had somehow replaced Darwinism.

Russell is most put out with the role of heredity in evolution. He says that Darwinism “has lessened men’s belief in the omnipotence of education, and has substituted the conviction that some races are inherently superior to others. This, in turn, has led to an emphasis upon nationalism. And the recognition of war as a means of competition has dissolved the marriage of competition with pacifism” (Cunningham, 1996:93). He goes on to say that Darwinism leads to the Jews and the Nordics being seen as the best races, and, thus, we ought to make them rich. He sees Darwinism as leading us away from what he calls the “cosmopolitan outlook” toward the “racial bigotry of the [Hitlerites].” Clearly, Russell cannot be put in the undecided column.

Cunningham suggests that Russell must not have attended to the many places in *Descent* where Darwin refers to the importance of education. She suggests further that if someone has not read *Origin* or *Descent*, they might well get the idea that there is a possible connection to fascism, but it is difficult to understand why anyone who has read these books, especially a great logician such as Russell, could come to such a conclusion. Moreover, Russell claims there is a hard distinction between whatever cognitive assets natural selection is capable of building into any species, including *Homo sapiens*, and full-blown rationality. His pursuit of rationality sees evolution as quite irrelevant. Cunningham wonders how Russell could not find more of a connection between rationality and natural selection after reading *Descent*. Russell did, apparently, find some ideas in Darwin. In *Human Knowledge: Its Scope and Limits* he writes:

There is another thing which it is important to remember whenever mental concepts are being discussed, and that is our evolutionary continuity with the lower animals. ‘Knowledge,’ in particular, must not be defined in a manner which assumes an impassable gulf between ourselves and our ancestors who had not the advantage of language. (1948:421)

Earlier in that book he says that there have been “battles between science and theology,” but these were “overshadowed” by “the great battle over evolution” that the publication of *Origin* created, and that he saw as continuing in America. “But I shall say no more about these somewhat dusty controversies” (1948:31).

There are two points that should be learned from Russell’s thinking, with regard to evolution. Russell clearly seems to have built no wall between the politics that can be found in evolutionary theory and what is called the “principle of charity” when evaluating another’s work, that is, to begin by seeking an interpretation of the work to be criticized that is not simply a matter of ax grinding. It is possible to take any set of putative facts and weave alternative explanations of them the same way that someone can wind different string patterns over six nails that have been driven into a board. In statistics there is a process known as finding the line of best fit, which is the line or curve that minimizes the variance of a set of points from that curve. Something like this should go on in any attempt to explain or evaluate any given thesis. Russell seems to begin, like a small group of academics do today, by setting forth some conspiracy theory or explanation involving misguided politicians. Serious philosophers would always know their biases and then make every effort to “hold them at bay,” as Philip G. Smith used to say. Some academic meetings seem to have presenters who, in place of holding their biases at bay, set them on their audience as one turns the dogs loose to attack an intruder.

The second sin of which we may accuse Lord Russell is that while he does see that animals have evolved and that there is no discontinuity between ourselves and the people that may not have had language or a developed language before us, when it comes to having knowledge, he goes on to hold that when reason itself is the focus of analysis, the fact of evolution does not enter into such analyses. It seems that Russell separates the mind from the occasions of its evolution. He seems to want to deal with purely logical concepts, as if they had no significant relationships to their mindless ancestors. Hence, it is not surprising that Russell’s most remembered achievements are his discovery of the contradiction in set theory, known as Russell’s paradox (which also applies to Aristotle’s syllogistic logic) and the theory of types in *Principia Mathematica*. As biologists consider Daniel Dennett to be their most relevant philosopher, logicians and mathematicians give that honor to Lord Russell. Both academic groups seem to have it right.

How could Russell and Dewey, friends who engaged in philosophic interaction, read *Origin* so differently? We know that Dewey sees philosophy as working with continuities in life. He sees human mindedness as a part of, and continuous with, the natural, prehuman world. His theory of experience is tied to, and explained by, the developing organs of human capacity. “‘Reason’ is not an antecedent force which serves as a panacea. It is a laborious achievement of habit needing to be continually worked over” (M14:137).

Russell sees philosophy as dealing with pure ideas, that is, with products of the mind. One wonders if the reason his reading of *Descent* did not influence his ideas was that a general rejecting of evolutionary accounts was irrelevant to the nature of reason. In other words, if a person or a society finds itself in an unacceptable situation, does it matter how it got into that predicament? What is required is a way out. Of course, Dewey and Dennett will say that ignorance of the causes of the problem will limit serious thought about a proper exit. But Russell sees reason as not bound by existing physical or psychological conditions. This may well explain how Russell could read *Origin* and *Descent* and see only the possible sociopolitical dimensions of natural selection.

One wonders if Russell is tacitly accepting some sort of radical genetic determinism. His remarks about heredity, which somehow undermine the significance of education and at the same time imbue science with racism, reveal that his ideas are, to say the least, unacceptable to Richard Dawkins and Daniel Dennett.

WHAT ABOUT GENETIC DETERMINISM?

[T]he phrase “genetic determinism” exudes ignorance as to what the new Darwinism is about. . . . [E]veryone (including Darwin) is a victim not of genes, but of genes and the environment together.

—Robert Wright, *The Moral Animal* (1994:348)

The only rejecters of evolution today are the religion-based Creationists and a certain lunatic fringe who reject evolution but have no replacement for it, and social criticism or epistemic cynicism will not fill the blank. The leading complaint of the latter group is the claim that philosophers engaged in the analysis of evolution are all determinists. Since this book associates the thought of Dewey and Darwin, it is important to address the red herring of determinism. Any discussion of the role of the genetic code in behavior evokes passionate responses in academic circles and requires a fair grasp of the principles involved to proceed productively.

The reason that some academics will reject any kind of genetic determinism while readily accepting various types of social determinism is that they smell racism, that is, that what people are is determined by their genes, and there is very little anyone can do to change them. These people readily accept social determinism of various types because they hold that it is then possible for fair-minded people and just social institutions to make people over in more equitable ways. Social determinism is thought to be more flexible than genetic determinism, which means that people can change things to their liking,

whereas if the determining factors in what a person is or does are genetic, then social engineering is impotent to the degree that the genome has control over the person. It is possible that by riding roughshod over genetic determinism before it is understood, and placing all their efforts into social determinism as the pursuit of equality, they have furthered injustice and inequitable treatment. It turns out that even framing the discussion in these either-or terms is a serious mistake; moreover, we do not have to face the overly simplified disjunction presented to us, because contemporary evolution theory, as will be seen, rejects both genetic determinism and social determinism as they are presented, since neither is a supportable view.

This is worthy of our consideration, because we can establish some basic principles underlying these discussions, with the hope of preventing some of the fears of the evils of genetic determinism. Dawkins once felt so unfairly put upon by his critics that he feared that “there is a wanton eagerness to misunderstand” (1982:10). His being seen as a sociobiologist, an unacceptable orientation for many people, may explain some of this criticism.

As one researcher put it,

People love to oversimplify genetics, saying we have a “gene for cancer” or a “gene for diabetes.” But the fact is, genes determine only so much. Identical twins have identical genomes, yet one may develop juvenile diabetes and the other typically doesn’t. Understanding the role of genes should help pinpoint environmental factors and teach us how to avoid genetic predispositions. But people tend to invest genes with a determinism that isn’t justified by science. (Eric Lander, head of the Whitehead MIT Center for Genome Research as reported by R. Thompson, 2000)

Lander’s statement makes it clear that the extreme views: (A) genes cause all behavior, or ($\sim$ A) genes cause no behavior are ridiculously misguided. The question is, what kinds of things do genes influence, and how do they do it?

Unfortunately for some people, Huntington’s disease is a matter of fate. In 1993 the gene for this disease was discovered on chromosome 4. Anyone who has the gene for Huntington’s will get the disease (typically between the ages of 8 and 25) no matter what they do between birth and the onset of the disease. The gene makes a toxic protein (*huntingtin*) that changes the functions of other proteins (Watson, 2003:311). The one exception to seeing this gene as fatalistic is the possibility of future genetic engineering, in which researchers invent a way to turn off the gene or rewrite its code. Let us think of the gene for Huntington’s as the benchmark of genetic determinism. Fortunately for all of us, very few diseases are deterministic in the benchmark sense.

One notion that we must jettison is thinking that all genes for diseases are like the benchmark gene—little bombs that are within us just waiting to go off and cause us some distress. It is popular for the news media to report

that “the gene for ____” has been identified by researchers. Many hear or read this as an announcement that another gene just like Huntington’s has been found and that if you have it you are doomed to develop the disease. This is not correct. A person can have the gene for *X*, and that gene may never be *expressed*. For a gene to help us or hurt us it must be turned on. For many genes, this is a matter of environmental conditions. For example, two people may have the same gene that can make a toxic protein, yet one suffers from the existence of the toxin, while the other does not. This might be explained by stress. The person who develops the toxic condition may have experienced great stress in life, while the other person did not. Did this *X* gene cause the toxic condition? Well, yes and no. It is a necessary condition for the disease to be present, but it is not a sufficient condition, as is the Huntington’s gene.

We have three logical possibilities for the relationship between diseases and DNA. (1) In our benchmark case, having the identified sequence in one’s DNA means that a person is predetermined to get the disease. With this type of disease, the sequence of DNA is both necessary and sufficient to get the disease. (2) With other diseases, the sequence of DNA may be necessary but not sufficient to get the disease, as in the stress case just mentioned. Finally, (3) some diseases are completely irrelevant to our DNA. Note that your own DNA is irrelevant as to whether you get influenza, but the flu virus is, in effect, a piece of DNA.

For readers who still harbor doubts about the furtive entry of genetic determinism into the following discussions of Dewey’s philosophic reconstructions, or who are not clear in their own minds what to think about these determinism discussions, let me set you at ease. As we will see in the following chapters, the old debates over such matters are undercut by the contemporary relevant facts.

ULTRANATURALISM

John Dewey made it clear that Darwinism should be assumed to be the foundation of any naturalistic theory of meaning.

—Daniel Dennett (1995:403)

If you frequent old book stores, you have likely come across the title *Natural Philosophy*, which, upon inspection, turned out to be a book on natural science and not a book about the philosophy of nature. The terms *natural* or *naturalized* in contemporary philosophic discourse refer to a particular view of the proper methods of philosophic analysis. As noted above, a good reason to be concerned with Dewey’s Darwinism stems from the renewed interest in philosophic naturalism being brought on by current developments in the revolution in biology, as well as the interest being generated in cognitive

science by philosophers such as Patricia and Paul Churchland, John Searle, and Daniel Dennett.

Philosophic naturalism *simpliciter* is the view that scientific conclusions are appropriate elements within philosophic arguments; thus, naturalism contrasts markedly with the views of philosophers such as Wittgenstein of the *Tractatus* (1922) (as opposed to Wittgenstein of *Philosophical Investigations* [1953]) who claim that philosophic argumentation must always be conducted prior to any attention to scientific theories. Psychology, for example, is seen by Wittgenstein, *inter alios*, as having no role whatsoever in the work of philosophers. It is held that to the extent to which philosophy enters into psychological theories, it must be in the form of *previously established* philosophic conclusions. This thesis is sometimes referred to as “first philosophy.” When considered in the present context, this view suffers from the same malady as the theory that Dewey says was “cut straight under” by Darwinism. To understand the role of culture, language, and morality in human affairs, naturalism requires evolutionary explanations.

Wittgenstein’s position seems seriously deficient when one examines the rich and developing literature of cognitive science in which we find extensive use of various conclusions from scientific research. Current philosophic studies of consciousness, cognition, freedom, and morality draw heavily from research in neuroscience as part of an effort to understand how the brain and complete neurosystem function. For example, Patricia Churchland’s book *Brain-Wise* (2002) is an excellent presentation of how research in neuroscience has relevance to the solution of traditional philosophic problems. She establishes clearly that first philosophy cannot adequately deal with questions of mind, consciousness, and self. Like it or not, philosophic analysis must consider the work being done in science, especially biology.

In pursuing the question of how humans came to possess language and, consequently, came to have a different kind of consciousness and intelligence from the other primates, Dennett (2003:260), as was alluded to above, suggests that we should distinguish *historical* questions from *justification* questions. There may be various compelling historical accounts of how all these things occurred, but to be considered a justified account, it must include a Darwinian explanation. Dennett’s critics like to refer to his views as “hyper-Darwinism” or “ultra-Darwinism,” suggesting, of course, a preoccupation with Darwinism. Recall Dewey’s point, quoted above, that accounts of natural history after Darwin should be quite different from those produced before Darwin.

One has to wonder, after reading Dewey and Dennett, if the expression *philosophic naturalism* suggests the penetration or intensity that Dewey and Dennett bring to the reconstruction of philosophic methods. In other words, what passes for naturalism is not sufficiently imbued with Darwinism for us to say that Dewey and Dennett are simply philosophic naturalists. The claim here is that to understand Dewey (or Dennett), one must look for something

more in naturalism. And as “more” as a philosophic naturalist can go is to hold that evolutionary theory is always potentially relevant, if not downright central to, philosophic problems. It would be appropriate to refer to Dewey and Dennett as “ultranaturalists,” because their thought goes well beyond simply appealing to science, even neuroscience.

The first two sentences in Richard Hofstadter’s introduction to his well-known book, *Social Darwinism in American Thought*, are as follows:

In 1959, one hundred years after the publication of Darwin’s *The Origin of Species*, mankind has lived so long under the brilliant light of evolutionary science that we tend to take its insights for granted. It is hard for us fully to realize the immense thrill of enlightenment experienced by Darwin’s own generation; it is harder still to appreciate the terrors experienced by the religiously orthodox among them. (“Author’s Introduction,” 1992:3 edition; First published in 1944)

Today we still experience, if not the thrill of its discovery, the brilliant light of evolutionary theory and the insights it provides us for thinking about traditional philosophic matters. We also note, if not the experience of terror, the hostility of some to the very idea of the requirement that all things cognitive and emotional have their genesis explained in terms of the evolutionary algorithm and the subsequent developments that have produced our present powers of thought and feeling.

But ultranaturalism goes further in its quest for evolutionary explanations. We know that genes, chapters in the DNA book of what we are biologically, are instructions for making proteins. But how can we explain the fact that our brains went further and became minds? The genetic code does not make or contain minds. If it did, then all of those stories of people being regressed into some previous century by means of “gene-coded memory” would be so common as to not be worth mentioning.

THE DISCUSSION THUS FAR

The fact that Russell, one of the great logicians of the 20th century, dismissed evolution as having no significance for philosophy reveals how Dewey’s writings were going against the grain of the established philosophy early in that century. Not all philosophers of that time rejected evolution as vociferously as did Russell, but none saw the requisite methodological reconstructions that Darwin’s thesis demanded of philosophy. It was suggested that the ultimate form that philosophic naturalism could take, ultranaturalism, would be a naturalism built upon evolutionary theory. To develop greater insight into Dewey’s arguments, it is necessary to examine more closely the structure of evolutionary theory, a task to which we now turn.

CONSIDER READING

1. Many students report that John Dewey's *Reconstruction in Philosophy* (M12) is a useful entry point into his writing.

2. A good place to begin the study of evolution is with Charles Darwin himself. *The Origin of Species* (1859) is not difficult reading and well worth the time to experience the theory in Darwin's own words.

3. Robert Wright's *The Moral Animal* (1994) presents a history of Darwin's thinking as he developed his theory and subsequent ideas. Wright applies the theory to Darwin himself, which offers us some interesting reading and insights.

4. Richard Dawkins' *A Devil's Chaplain: Reflections on Hope, Lies, Science, and Love* (2003) presents Dawkins' reflections on his experience as a biologist working within the revolution he helped create.

5. Patricia Smith Churchland, *Brain-Wise: Studies in Neurophilosophy* (Cambridge, MA: MIT Press, 2002) shows how many of the traditional philosophic problems are reinterpreted in light of research in brain science. It is a very accessible introduction to philosophy and/or cognitive science.

6. Richard Hofstadter's *Social Darwinism in American Thought* (1944) presents background on how Darwinism can be misunderstood and misused as social policy.

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PART ONE

Theory of Evolution

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TWO

What Is Darwinian Evolution?

The intellectual journey that had begun with Copernicus displacing humans from the center of the universe and continued with Darwin's insistence that humans are merely modified monkeys has finally focused in on the very essence of life. And there was nothing special about it. The double helix is an elegant structure, but its message is downright prosaic: life is simply a matter of chemistry.

—James Watson, *DNA* (2003:xii–xiii)



Currently, many philosophers are working in the area known as cognitive science, which involves philosophic analysis of virtually every dimension of evolutionary theory. In this chapter we will examine evolution as a scientific theory but with an eye to the philosophic issues surrounding Darwin's thesis. If you are familiar with the theory, you may want to move on to the next chapter. The last section of the present chapter reviews Dawkins' reasoning that the pressure of natural selection is on the genome, not on individual living things.

INTRODUCTION

Whenever Darwinism is the topic, the temperature rises, because more is at stake than just the empirical facts about how life on Earth evolved, or the correct logic of the theory that accounts for those facts.

—Daniel Dennett, *Darwin's Dangerous Idea* (1995:21)

IN THE FALL OF 1831, Charles Darwin, a 21-year-old naturalist, boarded the H.M.S. *Beagle* at the behest of Captain Robert FitzRoy (Darwin was his fourth choice), who was about to set sail for Terra del Fuego. Thus began the most significant voyage in human history, when judged by the changes that it produced as to how we would see ourselves, religion, and the nature of our world. Nichols suggests, in *Evolution's Captain* (2003), that without what Darwin encountered during that voyage, along with the extended discussions he had with Captain FitzRoy, the Darwinian Revolution may not have occurred. That we can never know for sure, but Darwin possessed an active and inquisitive mind, and one has to wonder whether he might not have found other provocative contexts that would have led him toward natural selection. Nevertheless, Nichols makes it clear that Darwin's discussions with FitzRoy, a dyed-in-the-wool Creationist, while being in the context of new species and new environments, did, in fact, serve as the springboard for the revolution in biology, religion, and philosophy.

H.M.S. *Beagle*, the most famous ship to have ever served the development of science, was sold in 1870 at public auction for 525 pounds, and broken up shortly thereafter (Nichols, 2003:327). But take a moment to imagine what it would be like if she were now anchored somewhere in England, much as the U.S.S. *Constitution* is anchored in Boston Harbor. Biologists the world over would have to make a pilgrimage to set foot on the decks of H. M. S. *Beagle*. (The spacecraft launched by the European Union in 2003 to land on Mars is the *Beagle II*.)

The *Beagle* returned to Falmouth, England, in October 2, 1836, after 58 months exploring South America. Twenty-three years later, in 1859, Charles Darwin published the most significant work in the history of science: *The Origin of Species*. His theory is that living things are engaged in a struggle for survival, which is sometimes crudely described as a matter of eating without being eaten. The struggle for survival means that those individuals that possess greater speed, olfaction, sight, agility, claw, fang, and so on than do the other animals with whom they must compete will be more likely to have progeny or to have progeny in greater numbers than those less competitive individuals. By what Darwin calls "natural selection," their species becomes better and better adapted to the environment in which its members must seek to survive.

For evolution to be possible, there must be *variation* within the members of the species in a given environment who are able to *replicate* themselves and who are under survival pressure, which means that those individuals who possess characteristics that give them a competitive advantage will be *selected* by means of the competition in a struggle for existence. As Dennett likes to point out, Darwin discovered an algorithm such that evolution will occur with any group that has variation, heritability, and is under selection pressure. If all

three of these conditions are present, this collection is going to change in a nonrandom direction that is dictated by the selection criteria.

Darwin, in *Origin*, refers to the “mystery of inheritance.” Contemporary readers cannot help but wonder what would have happened if Darwin could have had lunch with Gregor Mendel (1822–1884), who was intensely involved in the study of genetics at the time Darwin published *Origin*. Had Darwin been able to engage in such discussions at the same level of analysis as those he had with Captain FitzRoy, the revolution in biology of the last 30 years may have occurred decades earlier.

In 1869, ten years after the publication of *Origin*, Johann Friedrich Miescher discovered a weakly acidic material in the nuclei of human white blood cells, the purpose of which was unknown. By 1928, Franklin Griffith was demonstrating that genetic information taken from heat-killed bacteria could be transferred to live cells, which responded to the genetic information. This meant that the genetic code is written in heat stable molecules. In 1944, Oswald Avery identified Griffith’s substance as deoxyribonucleic acid (DNA). By 1949, Erwin Chargaff found that the amount of DNA varies from species to species but that the amounts of adenine and thymine are equal in all cases, as are the amounts of guanine and cytosine. This information was essential in the final determination of the chemical structure of DNA. Adenine, thymine, guanine, and cytosine form the character set {A, T, G, C}, albeit it one composed of molecules rather than letters, in which the genetic code is written. Note that the code is written digitally because adenine, thymine, guanine, and cytosine always have the same meaning.

In 1953, James Watson and Francis Crick presented the world with the molecular structure of DNA, and in 1962, they, along with Maurice Wilkins, were awarded the Nobel Prize. Although the discovery of the exact nature of DNA was now at hand, it did not settle all the controversies about Darwin’s thesis, but it did show that general evolutionary theory had no credible rivals with regard to explaining our existence. (See Ridley’s [1999] discussion of the history of the discovery of DNA in his first three chapters. He reports that except for a “small piece in the [London] *News Chronicle*, the double helix did not make the newspapers.”)

SOURCES OF VARIATION

We call mutations “errors,” but from the perspective of evolution, the most serious error for a genome is to make no mutations.

—Lynn Helena Caporale (2003:11)

As noted, variation is one of the three conditions required for the evolution algorithm. If there is no variation in a collection of things that are placed

under selection pressure, then they will all sink or swim together, with the possible exception where selection is a random process. There are three ways that these individuals can vary if they are living things. From the time of the discovery of the chemical structure of DNA in 1953, until recently, the source of variation within genomes was taken to be by mutation. When the DNA reproduces itself, there is an error-checking process to make sure that the copies are accurate, and if they are not, then corrections are made. But the error-checking process is itself open to error. When a checking error is made, a different or modified genome is at hand, which is reproduced in the next generation.

Such errors could be irrelevant to selection pressure, which means the new form of one of the chromosomes simply goes along for the ride. There are portions of the DNA strands that are irrelevant in that sense, although the mutation could assist the individual organism in its struggle for existence or be detrimental to that struggle. In the latter case, selection will remove the mutation from the possibility of being reproduced. But if the mutation renders the organism better able to survive, then it will have progeny in greater numbers, all of which possess that mutation. In this way the collection of organisms evolve.

Some have wondered if the evolution of animals is fully explained by modifications in the DNA that occur only because of chance errors in the checking process. Lynn Caporale (2003) observes that some mutations are too frequent to be due solely to such errors. As she says, some of these mutations are much like accidents that are more frequent in busier intersections. Lynn Ripley examined mutations occurring over numerous generations of the T4 bacteria-killing virus (Caporale, 2003:36). Ripley detected that in a specific region, an A was being replaced with a C, and in another region a G was being replaced with a T. These changes could not be explained by randomness alone. Clearly, some regions were mutating more than others. But why?

The model of DNA we see in books is a precise, artistic-looking staircase. In reality (or, I should say, in the cell's nucleus), the staircase is not so neatly formed. The long strands of DNA are stuffed into the cell nucleus, which means that there are bends and fold-backs occurring. It is in some of these bends that Ripley found these kinds of mutations (see Caporale, 2003:37–39). So we have a second type of mutation in that the mutations discussed by Ripley are not random throughout the strand of DNA but are random within the context of how the DNA of a given kind of organism folds into the cell nucleus. If I understand Ripley and Caporale correctly, one can say that this second type of mutation is the result of the whole genome, since it is the genome that determines how the DNA strands, for a given species of organism, will be placed within the nucleus. But there is more to the mutation story.

Barbara McClintock studied the chromosomes of corn plants with only a cornfield and a microscope. What she was able to confirm has led some to conclude that her work may make her one of the most important biologists of the 20th century (Caporale, 2003:145). Why would she be given such accolades? *She discovered the jumping genes.*

What she observed in 1948 was that there are unstable places on the chromosomes such that genes in that area could move around on the chromosome. Jumping genes have been found in various different species, including humans, and are so predictable that some have been given names such as “hopscotch,” “hobo,” “mariner,” “tourist,” or “sleeping beauty” (Caporale, 2003:147). What is even more interesting is the fact that these jumping genes not only jump to different places on their own chromosome, but they can jump to other chromosomes. McClintock showed that genes in one area of a chromosome can change the genes in another area. In addition, she demonstrated that such gene jumping was responsive to the environment, especially in stressful situations. (Caporale, 2003:147)

As Caporale points out, McClintock’s findings have been extended by researchers into other areas, thus generating much additional support for her basic conclusion. But, Caporale says, we have yet to fully appreciate McClintock’s thesis “that when a genome ‘senses stress for which it is unprepared,’ genes jump, and the genome ‘reorganized itself.’ Just don’t everybody jump at once!” (2003:148). Barbara McClintock was finally awarded the Nobel Prize in 1983; Oswald Avery, the discoverer of DNA—the “inheritance molecule”—was never awarded the Nobel Prize, a checking error.

As many (but not all) people know, when the sperm meets the egg in the fallopian tube (several days after intercourse), fertilization occurs. A few more people who have studied biology know that a zygote is formed that becomes, through mitosis (cell division) a cellular ball known as a blastula, and then becomes a gastrula, during which time the cellular mass forms a dimple, indicating the developing distinction between ectoderm and endoderm. But the process of creating an embryo is much more complicated than this suggests.

We have 23 pairs of chromosomes with 23 chromosomes coming from each parent. “[A]s our germ-line genome prepares for the moment of mating, in the form of a haploid egg or sperm, it first divides by mitosis, then undergoes meiosis; and then the sperm divides by mitosis again” (Caporale, 2003:166). When a cell has 23 pairs of chromosomes, it is said to be a diploid cell. When a cell has only 23 chromosomes, it is said to be a haploid cell.

The first cell division, mitosis, produces 46 single chromosomes. The 23 chromosome pairs separate into the mother side and the father side, producing the following two sets of chromosomes. Note that this is a male’s genome, since there is a Y chromosome present.

<i>Mother's Chromosomes</i>	<i>Father's Chromosomes</i>
M1	F1
M2	F2
M3	F3
.	
.	
M22	F22
MX	FY

The next step is for these two sets of 23 chromosomes to replicate themselves, producing:

<i>Mother's Chromosomes</i>		<i>Father's Chromosomes</i>	
M1	M1	F1	F1
M2	M2	F2	F2
M3	M3	F3	F3
.			
.			
M22	M22	F22	F22
MX	MX	FY	FY

We now have 92 chromosomes produced, which then group themselves so that one of the mother columns pairs up with one of the father columns, producing two daughter cells as shown below.

<i>Genome 1</i>		<i>Genome 2</i>	
M1	F1	F1	M1
M2	F2	F2	M2
M3	F3	F3	M3
.			
.			
M22	F22	F22	M22
MX	FY	FY	MX

At this point there is another step in duplication and division. Let us focus on one of the above twin-sister cells above. Duplication would occur once again, just as before, producing 46 chromosomes.

<i>Genome 1</i>			
M1	M1	F1	F1
M2	M2	F2	F2
M3	M3	F3	F3
.			
.			
M22	M22	F22	F22
MX	MX	FY	FY

But the meiosis stage now does something unexpected. The chromosomes pair up as in the following example.

<i>Genome 1-A</i>	<i>Genome 1-B</i>
M1,M1	F1,F1
F2,F2	M2,M2
M3,M3	F3,F3
.	.
.	.
F22,F22	M22,M22
MX,MX	FY,FY

The chromosome 1 pair no longer share information, because each daughter chromosome stays with its sister.

These two cells divide to produce four sperm cells.

<i>Four Sperm Cells Produced</i>			
<i>cell 1</i>	<i>cell 2</i>	<i>cell 3</i>	<i>cell 4</i>
M1	M1	F1	F1
F2	F2	M2	M2
M3	M3	F3	F3
.	.	.	.
.	.	.	.
.	.	.	.
F22	F22	M22	M22
MX	MX	FY	FY

If this example had begun with a female's genome, the four cells above would be egg cells. Since women possess no Y chromosomes, the last row above would contain only X chromosomes. This means that there are three times the number of X chromosomes in the game than Y chromosomes—an ominous fact for the Ys, as we shall see shortly.

This example followed the creation of four sperm cells, but the interesting point is that there are many more combinations produced by the one original cell. But how many? There are two possibilities for each of the 23 chromosomes, which is 2^{23} or 2×2^{22} times. It turns out that there are 8,388,608 possible 23 paired-chromosome genomes created. One can readily see why the children from large families can all be quite different from each other, and that is without the possibility of mutations or jumping genes. But genomic diversity does not stop there. Within these 8 million genomes created, there is the process of crossing over each other; that is, some DNA strands are broken and then modified so that their missing part is filled by a different strand, the remaining part of which connects with the displaced part of the first strand. This process is described in Caporale (2003:168–70).

Why all this diversity? Do we really need to be moving genes around in such an extravagant manner? When it comes to biology, something is always after us, and sometimes gaining on us. “Our ability to combat the spread of antibiotic resistance, the emergence of new pathogens, and the growth, spread, and indeed evolution of each tumor all are affected by strategies for evolution that emerge in genomes that threaten us” (2003:103). Moreover,

The microbes themselves would be enough of a threat, but it is of course worse than that. Until the human heart abandons thoughts of killing other members of our species, we must be vigilant, and imaginative, to detect swiftly and to combat microbes that have been redesigned to be weapons . . .—a terrifying twist on the phrase ‘the enemy within.’ (2003:108)

What is known in biology as the “Red Queen effect,” is an idea borrowed from Lewis Carroll, where the Red Queen has to keep running as fast as she can just to remain where she is. Some of you who find yourselves in competitive situations can easily form an empathic relationship with the Red Queen. In biology we cannot rest on our laurels because there are parasites and diseases ready to take us over and wreck havoc with us for their own benefit, but our genomes do not make it easy for them. As fast as they learn to pick our genetic locks, we change them. Those 8,388,608 new possibilities that our enemies find in the next generation are certainly going to slow down the invasions. But our enemies are ever researching our locks, so, like the Red Queen, we must keep changing our genomes as fast as we can to stay even—to stay alive in the face of the armies of other Red Queens who also must run fast to have a chance to survive.

Even this brief discussion shows us that just because we *Homo sapiens* have been around for tens of thousands of years, we do not have a guarantee for our continued existence. We may be the ones with the large brains, but that is only an advantage if we focus on our problems and do not fall into the comfortable but misguided threat denials so common in America today.

When we think of heritability in terms of the generation producing the offspring, we refer to reproduction. When we talk about heritability from the point of view of the progeny, we talk about that which is inherited. When we consider the offspring or progeny of one human generation, we hear talk about how “the fruit doesn’t fall far from the tree” or “like mother, like daughter,” which, of course, suggests that there are characteristics of one generation that can be passed on, inherited by the next generation. Moreover, we do not expect that a woman’s daughter will be exactly like herself, because the genes of the father have gotten into the act. We would not be here if it had not been for literally billions of instances of sexual intercourse that produced a pregnancy in each generation of our germ line. For every person or animal we see sharing the planet with us, there were trillions or quadrillions who did not

make it to the 21st century. From a purely chance point of view, the odds were against any of us being here. But here we are, and feeling, I hope, a degree of responsibility for the future of all these species.

There are two possible exceptions to inheritance by sexual reproduction: one old and the other not yet new. (1) In the process known as *parthenogenesis* or virgin birth, the female of a species produces an ovum that develops into a daughter without the requirement of male fertilization, a process that is common in insects. There are no known instances of parthenogenesis in humans, but Gregory Pincus is said to have induced it in rabbits in 1936 by means of temperature and chemical controls. (2) The other possibility is cloning. The famous female sheep, Dolly, was cloned in Great Britain, but as far as we know no humans have been created in this way.

The human genome has been mapped, but that is a far cry from knowing just how everything works. There is, of course, the ethical question of how sure we have to be before we create an experimental baby. And the prior question is, should we do it even if we know we can? Unfortunately, as Dennis Gabor, the 1971 Nobel Prize winner in physics, points out in his book, *The Mature Society* (1972:42), except for the refusal of the U.S. Congress to appropriate money for the Super Sonic Transport in 1971 (which France and England did build and recently retired), the principle of, if we can do it, then we will do it (what he calls “technology autonomous”) has ruled the day. There is a kind of philosophic suspense being felt right now by some who wonder if we will see cloning people as something that must be tried.

THREE KINDS OF SELECTION

Core Darwinism, I shall suggest, is the minimal theory that evolution is guided in adaptively nonrandom directions by the nonrandom survival of small random hereditary changes. Note especially the words *small* and *adaptively*.

—Richard Dawkins, *A Devil's Chaplain*
(2003:81; emphases in original)

We tend to think of the animals of the woods, plains, and jungles as struggling to survive, but to understand natural selection adequately, we must focus on the genes themselves, for it is they who are the objects under selection pressure. If you are the animal being chased by a predator, then the point that it is not you but your genes that are the objects of natural selection does not matter to you; but if you are a biologist asking how we got here, then the most productive way to conduct a scientific study of evolution is to focus on the genes and not the individual members of the species. So what we want to keep in mind is the notion that it is the gene's survival that is the basic engine of

evolution. There are three processes of genetic selection: *natural*, *sexual*, and *methodological* (or unconscious), to use Darwin's terms.

We begin with natural selection.

It may be said that natural selection is daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life. (*Origin*, 133)

As noted, those animals that cannot reproduce are irrelevant to the evolution of their species, because even if they are selected they cannot pass on their characteristics. The variation among those animals that can reproduce are the ones participating in the evolution of the species, because the progeny will have characteristics that contribute to the animals' ability to avoid predators, find food, and survive microbial infections.

As Darwin states in *Origin*,

In looking at Nature, it is most necessary to keep the foregoing considerations always in mind—never forget that every single organic being around us may be said to be striving to the utmost to increase in numbers; that each lives by a struggle at some period of its life; that heavy destruction inevitably falls either on the young or old, during each generation or at recurrent intervals. Lighten any check, mitigate the destruction ever so little, and the number of the species will almost instantaneously increase in any amount. (119)

The selection process will accept some characteristics and reject others, and since the selected members can reproduce themselves, the next generation will possess more of the characteristics selected than the previous generation. As Darwin points out, "Natural selection tends only to make each organic being as perfect as, or slightly more perfect than, the other inhabitants of the same country with which it has to struggle for existence" (*Origin*: 229).

Darwin distinguishes natural selection from sexual selection as follows: "This depends, not on a struggle for existence, but on a struggle between the males for possession of the females; the result is not death to the unsuccessful competitor, but few or no offspring. Sexual selection is, therefore, less rigorous than natural selection" (*Origin*, 136). The example typically used in the literature as an example of sexual selection is the peacock's tail. How could a bird's tail be a matter of sexual selection? If the peahens prefer males with large colorful tails, then peacocks with large colorful tails will tend to have their genes in the next generation, while those males who have lesser tails will not have opportunities to mate, and, thus, not have their genes conveyed to

the next generation. It is the choices made by the peahens that determine the characteristics of the peacocks' tails.

In his discussion of methodological or unconscious selection, Darwin makes clear how this differs from natural selection. "One of the most remarkable features in our domesticated races is that we see in them adaptation, not indeed to the animal's or plant's own good, but to man's use or fancy." (*Origin*, 89) Darwin goes on to point out that while breeders are trying to produce a certain outcome, they are practicing "unconscious" selection in that they are making changes in the breed of which they are unaware and with which they are unconcerned. In these cases, the genes that survive are those associated with, say, larger breasts in turkeys or better wool in a certain kind of sheep.

Sexual selection is centered (in most cases) on the females of the species' selections of a partner for reproduction, and methodological selection is what breeders do as they strive to produce individual members of a species with certain characteristics deemed desirable by the breeder, while ignoring or being unconscious of the changes they are making in other characteristics of the species. When we turn to human reproduction, the distinction between sexual and methodological selection blurs together, because when a woman or a man makes a sexual selection, it is in some cases a conscious methodological selection on the set of characteristics consciously held in mind, but it will also be an unconscious selection, in that the person's choice influences other characteristics of which they may be unaware.

On the national scale, there was methodological selection advocated by the eugenics movement in America (see Watson 2003). The idea was to increase the quality of the human race by selective breeding. If we take the large step and omit the ethics or morality of this idea, we see how arrogant those eugenicists were in thinking that they knew enough to make selections that would actually produce the characteristics they deemed valuable. Now we know the genome is much more complicated than they could have imagined. Who knows what kind of mess they would have made of the human genome had they been allowed to proceed on a large scale. Will eugenics reappear under a different name? Probably not, because we no longer have to breed for certain desirable characteristics, since we are close to being able to manipulate the genome directly. I will leave you with the ethical questions surrounding this matter.

Jared Diamond, in his well-known book *The Third Chimpanzee* (1992: chapter 11), wondered why cigarette and whisky manufacturers would place expensive advertising in magazines and elsewhere, when everyone knows that these products are harmful to their users. In thinking about the explanation for bird evolution, he says he came to the answer. In many cases, the male bird possesses characteristics that do not assist them in the struggle for survival, for example, the peacock's large and difficult-to-conceal tail. This led him to wonder why females find those obvious hindrances to survival so attractive. He concluded that these questions were answered by Amotz Zahavi's hypothesis

(Diamond, 1992:197–98) that males demonstrate such handicaps to the females as a way of showing that they can handicap themselves and still survive. If the game is the struggle for existence, and this male shows that he can survive as well as any of the other males while handicapping his own performance, then he must have better genes than his competitors.

The females get to make these choices because (1) the males want to mate with a female, and (2) “females invest more in reproduction, have more to lose, and have to be choosier. Ideally, a female should pick a male for his good genes to pass on to her offspring.” (1992:196–97) Diamond continues by pointing out that it is difficult to assess male genes, so the female must judge by “quick indicators” for them. In the human case, it may be possible in the very near future for a woman to review a man’s genetic profile before making any commitments. (Watson [2003] says that the 1997 movie *Gattaca* shows us a future where one’s genome is used to determine one’s place in the social structure.)

THE X AND Y CHROMOSOMES

Some Cupid kills with arrows, some with traps.

—Shakespeare, *Much Ado about Nothing* (III, I, 106)

Bainbridge, in his book *The X in SEX: How the X Chromosome Controls Our Lives* (2003), presents a brief history of the discovery of the X chromosome by Herman Henking, who was working in Leipzig in 1890. In his studies of cell division in flies, he observed that the chromosomes that made the eggs and sperm were very different from the chromosomes that made all of the other cells. As the chromosomes did their duplication dance in mitosis, they always performed the same basic moves. But there was another chromosome that seemed not to be taking part in the process and remained to one side, out of the way. For reasons that are unclear, Henking referred to this bashful chromosome as the “X” chromosome. “Mystified by this ‘wallflower chromosome,’ he gave it a name, although we are not entirely sure why he chose that name. Perhaps because it was mysterious, or because it appeared to be ‘extra,’ or because it was an apparently redundant ‘ex-chromosome,’ he called it ‘X’” (Bainbridge, 2003:5). Or, the “X” may refer to the unknown of mathematical equations.

Since a man discovered the X chromosome, science balanced the credits for discovery of the chromosomes involved in sexual reproduction by giving us a researcher named Nattie Stevens, working at Bryn Mawr College for Women in 1905, who would discover the “Y” chromosome. “She had discovered the great prize of heredity—the chromosomal basis of sex” (Bainbridge, 2003:13). “This diminutive partner is now called the Y chromosome, and Nattie Stevens was the first person to realize that it is this, and not the X that

controls sex" (ibid.). This chromosome does not look much like a Y, but her name for it was based on alphabetical order rather than appearance.

Biologists are always personifying molecules, saying things such as the genes want to duplicate themselves or that our own genes do not care about us since they are selfish and care only about their own immortality. This way of reporting what is going on is fine, as long as new readers do not get the idea that molecules and genes have goals and select means to realize those goals. That kind of talk is always hind-sighted, in that when we look back on successful genes in the game of natural selection, it does seem at times that those molecules were more than simply lucky. Keep this point in mind as we go the next step.

There is a tendency to think of our genomes as being there for us, serving us, with our best interest always first in line. The biochemical molecules, genes, and chromosomes care nothing about us. How could they, when they do not even know we exist? The argument of evolution from design leads one to think that we are the center of value, and all of the materials that constitute us are there to help us. As science shows us once again, we are not the center of things or all things important. While there is a definite feeling of comfort in the idea that all our internal chemistry is working for our survival and betterment, it blinds us to the really fascinating processes that are going on within us and that help explain why we are here and so many other creatures are not.

The sex of young alligators and other reptiles is determined by the temperature of the eggs as the animal develops within. At some point in our deep past the determination of the sex of offspring moved from determination by temperature to the presence or absence of a certain chromosome. When the sex of offspring became a matter of the Y chromosome, much greater genetic diversity was made possible, as we saw above. Most people who have thought about such things have some idea of how this works and how new genomes could be created by sexual reproduction. But the battles that underlie this process could hardly be imagined by most people.

Early in the twentieth century, the expression *the war between the sexes* bounced around America, though those who used this expression had no idea of the war that had been going on for centuries within genomes. There is the SRY gene on the Y chromosome that sets the whole masculinization of the brain and the rest of the body in motion. Ridley points out that some people are born with one X chromosome and one Y chromosome, that is, are genetic males but develop as normal females. How can this be? These people have two DAX genes on their X chromosome, and it turns out that two DAX genes and one SRY gene equal, so to speak, one DAX gene, which produces an ontological female. This further suggests that the DAX gene and the SRY gene are antagonistic to each other. "Any gene on the Y chromosome is vulnerable to attack by a newly evolved driving X gene. The result has been that

the Y chromosome has shed as many genes as possible and shut down the rest, to ‘run away and hide’” (Ridley, 1999:111). Most of the Y chromosome contains noncoding DNA, which is to say it is never expressed and contributes nothing to our genomes except a bit of extra chemistry. This defense against the genes on the X chromosome explains why the Y chromosome is quite small in comparison to other chromosomes and whose existence was the last to be discovered by investigators.

Think about natural selection with regard to the Y chromosome. One thing we know is that with the exception of people who have two DAX genes on their X chromosome, the Y chromosome will only be found in males, which means that this chromosome could acquire other genes that when expressed were good for males alone and will never exist or be expressed in females. The Y chromosome is freed from the demands and attacks of the genes that enhance the functioning of females and can thus develop without the scrutiny of genes whose expression enhance males, that is, genes that are naturally selected within the male population. In other words, “Because a Y chromosome will never find itself in a female, it is free to acquire genes that are very bad for females so long as they are slightly good for males (if you still thought evolution was about the good of the species, stop thinking so right now)” (Ridley, 1999:113).

There is another aspect of the X and Y conflict that suggests that the genome we have is not the one that a master designer would devise. It turns out that the placenta is formed by the male genes, while the fetus is basically created under the design of the female genes. The experiments that lead researchers to this conclusion are described in Ridley (2003:208–09). A consequence of this genetic arrangement is that the placenta is a foreign body that attempts, for example, to control the mother’s blood pressure for the benefit of the fetus, while the mother’s body fights against this effort for the benefit of the mother.

LAMARCKIAN EVOLUTION

On verra que chaque progres acquis dans la composition de l’organisation et dans les facultes qui en ont ete les suites, a ete conserve et transmis a d’autres individus par la voie de la reproduction, et que par cette marche, soutenue pendant une multitude de siecles, la nature est parvenue a former successivement tous les corps vivants qui existent.

—Jean Baptiste Lamarck, *Philosophie Zoologique* (1809:313)

In the past, some have thought that what we learn from our experiences in life can be passed on to our children. In other words, they claim that as our life expe-

riences change us, these changes can be inherited by progeny. From time to time persons surface who claim to have actual memories of people who have come before them and who are no longer living. A famous case in the midtwentieth century was Bridey Murphy, who was “regressed” through hypnosis to an earlier time. Can some people summon forth memories of earlier people?

To understand what is being asked, we need to distinguish the *phenotype* and the *genotype*. When you look in the mirror, you see protein, which is your phenotype. Your genotype is your unique (unless you are an identical twin) set of chromosomes found in the nucleus of each cell in your body. What is the relationship between the phenotype and the genotype? The phenotype is determined by the person’s genotype and environment. An infant may have a genotype that is free of Huntington’s disease and fragile X, two genetic diseases, and still not develop into a healthy adult. Various conditions have been identified that result from poor dietary intake. As we know all too often, if various house plants do not get the right amount of water, sunlight, and nutrition, they fail and even die. Everyone cannot be an Olympic track and field medal winner just because they eat and train well. And, conversely, just because one has a good athletic genotype does not mean that one does not have to train and so forth.

Jean Baptiste Lamarck (1744–1829), one of the curators at the Natural History Museum in Paris, published his views on evolution in his major work *Philosophie Zoologique* in 1809, which was the year of Charles Darwin’s birth and before Mendel’s conclusions about inheritance became widely known. Lamarck’s theory of evolution holds that it is possible that some characteristics that we acquire in life can be inherited by our children. That is, a species would improve over time if the members of each generation improved themselves. Now we would express the Lamarckian thesis as a claim that the phenotype can change the genotype.

A challenge to Darwinism arose when it was pointed out that there are cases where the phenotype can modify the genotype. In Darwinism, these cases are considered impossible, by what is known as the Weismannian doctrine, that is, that the genome cannot be modified through learning. Stated differently, the Weismannian doctrine claims that characteristics acquired by the phenotype cannot be passed on to progeny. This is at times referred to as the “central dogma of biology.” If it is shown that acquired characteristics can be passed on via the genome, then the rejected theory we refer to as “Lamarckian” appears to be true after all, and Darwinism is simply wrong.

This issue is noteworthy because it is sometimes said by the ideologues that this evidence refutes the Dennett–Dawkins Darwinian view. If this rejection of Darwinism can be sustained, then Dennett’s account of the evolution of freedom, *inter alia*, is undercut and rendered irrelevant. Dawkins gives a more technical definition of Lamarckism (in the glossary of his book, *The Extended Phenotype*, 1982:296) as follows:

Regardless of what Lamarck actually said, Lamarckism is nowadays the name given to the theory of evolution that relies on the assumption that acquired characteristics can be inherited. From the point of view of this book, the significant feature of the Lamarckian theory is the idea that new genetic variation tends to be adaptively directed, rather than “random” (i.e., non-directed) as in the Darwinian theory. The orthodox view today is that the Lamarckian theory is completely wrong. (1982:296)

Note that “adaptively directed” refers to what is a crucial aspect of the thesis.

Steele (1979) discusses a study done with rabbits that were injected with a foreign substance. All the rabbits developed antibodies, but not the same antibodies, which some of the rabbits passed on to their next generation. Steele concludes that this is a case of an acquired trait being inherited, thus refuting the existence of the Weismannian barrier. This would mean, a fortiori, that Darwinism is not the correct account of evolution.

At times one encounters, in the marginal philosophic literature, conclusions based on studies such as Steele’s, that Lamarck, and not Darwin, is the real discoverer of evolution. This claim shows an unfamiliarity with history. Even if the Darwinian view is wrong, it would be an error to think that Lamarck is, by default, the real discoverer of evolution. As Dawkins states, “it is not true that the idea originated with him: he simply took over the conventional wisdom of his time and grafted on to it other principles like ‘striving’ and ‘use and disuse’” (1982:167).

Dawkins addressed Steele’s conclusions as follows (1982:164–78). The rabbits in Steele’s study developed different antigens for the same foreign material with which they were injected, which suggests that the development of the antigens was a random process (natural selection) as Steele himself states. But Dawkins points out that if the phenotype is seen as the unit of heredity, then it does appear that a change in the phenotype was inherited contra the Weismannian doctrine. As Dawkins observes,

The very essence of Steele’s hypothesis is that adaptive improvement comes about through selection of initially random variation. It is about as Darwinian a theory as it is possible to be, *provided we think of the replicators and not the organism as the unit of selection*. . . . Steele’s kind of Lamarckism only seems like the imprinting of environmental features on the germ-line if we think at the level of the individual organism. (1982:168; emphasis added)

The antigens produced in the rabbit were a result of somatically mutated genes, which means that one would expect that such genes would be inherited.

Note that Dawkins is *changing the unit of replication from the individual organism to the germ line or genome*. This means that he is rejecting the traditional, commonsense view that our genes are there to help us (our phenotype)

develop and live. Dawkins reverses the traditional view, by claiming that it is our genes that are using our phenotypes to serve their survival requirements. This means that the actual unit under survival pressure is the gene and not the individual. While Darwin focuses on explaining how species evolved by considering how natural selection operated on individual organisms, Dawkins focuses on the germ-line explanation of natural selection.

Dawkins anticipates the objection that by changing the unit of replication in natural selection, he has made Darwinism so plastic that it can accommodate any kind of new evidence, thus making refutation impossible. But Dawkins, in the spirit of Karl Popper's falsifiability view of scientific inference, states the conditions under which he would reject this central dogma of biology. We must distinguish between (1) the dogma in molecular to protein, but not the other way around, and (2) the central dogma in embryology that "the macroscopic form and behavior of an organism may be, in some sense, coded in the genes, but the code is irreversible," that is, "form and behavior may not be translated back into protein." The dogma of embryology is "a logical implication of rejecting the preformationist view of development" (1982:174). Dawkins pulls these relationships together:

I suggest, indeed, that there is a close relationship between the epigenetic view of development and the Darwinism view of adaptation, and between preformationism and the Lamarckian view of adaptation. You may believe in inheritance of Lamarckian (i.e. 'instructive') adaptations, but only if you are prepared to embrace a preformationist view of embryology.

But what is the preformationist view of embryology? If preformationism were true, then the genome would, as Dawkins likes to put it, be a blueprint for the form and behavior of the organism. As the organism develops toward its adult form, it would learn from, and have its form possibly altered by, its environment, but its genome would be a blueprint written in chemistry for the building of its actual phenotype. The organism already existed, in a sense, in a preformed state within the genome. Biological growth is then a matter of the unfolding of these latent genomic features. In psychology of the past, the child was seen as a little man or woman whose adult form was in place and awaiting nutrition and experience to simply become a larger version of who he or she already was. (1982:174).

The relationship between preformationism and Lamarckism of which Dawkins writes can be revealed in Dawkins' appeal to the notion of a blueprint. The blueprint gives rise to the structure identified in it. Lamarckism can be seen as the view that if one adds a room onto one's house, the original blueprint for the house changes along with the changed form of the house, so it is then a relatively simple matter to use this blueprint to replicate this house down the street. What Dawkins is pointing us toward is the logical point that Lamarckism cannot be true if preformationism is not. Stated differently, Lamarckism assumes the validity of preformationism.

When people acquire new characteristics not contained in their germ line, these characteristics will be replicated in progeny only if the blueprint is rewritten as part of the acquisition process for these new characteristics. This is what is meant by referring to Lamarckian adaptations as *instructive*. The modifications in the phenotype become instructive to the development of the phenotype of an offspring just as the blueprint for a house is instructive to the builders. But if the genome is not simply a set of instructions for building a phenotype, then Lamarckism cannot be true.

In the literature there are discussions of how mitochondria or other organelles with their own genes may attach themselves to the egg and thereby influence the form of the phenotype, but these seem to be examples of acquired traits being replicated in progeny because one is thinking of individual organisms as the basic unit of replication. Dawkins' contribution to Darwinism is his directing attention away from the organism and toward the genes themselves as the basis of natural selection.

When Dawkins concluded that it was the genes and not the individuals that were under selection pressure, the door was opened to an obvious, but for some a disturbing, conclusion. Dawkins (1982) advanced what he calls the theory of "the selfish gene." He says that if we take the gene's point of view, we find that it is out to survive by reproducing itself. This point of view was taken by some to claim that genes control us and are selfishly driving us to behave in ways that benefit them. Many of the criticisms directed at Dawkins took him to be advancing some sort of extreme genetic determinism.

Before we continue, it will be helpful to make a short foray into gene activity, to dispel, once and for all, the old notion that our genome, our DNA, is there to help us and our species exist and improve. As Dawkins (1982:158) says, "the theory of selfish DNA is in a way revolutionary. But once we deeply imbibe the fundamental truth that an organism is a tool of DNA, rather than the other way around, the idea of 'selfish DNA' becomes compelling, even obvious." The selfish gene alternative view is that the chemistry of the genes for *Homo sapiens*, as well as any other species, evolved because the genes were able to protect themselves from attack by other genes and to produce a protein structure that allowed them to replicate themselves. Untold numbers of species did not make the journey from way back when to the present because their genes were defeated by more competitive genes that resulted in genomes that built phenotypes that could not survive in their environments.

THE DISCUSSION THUS FAR

Darwin's discovery is that when variation, replication, and selection exist within any group of organisms, those organisms will change in ways that make them more adapted to their environment, that is, more competitive with any other organisms

with whom they must struggle for existence. With an idea of what constitutes the basic algorithm of evolution, we have the scientific knowledge required to approach the issues associated with this area of philosophic analysis.

CONSIDER READING

1. Charles Darwin's *Descent of Man* (1874) focuses on human evolution, which was virtually omitted from *The Origin of Species*. His concern is with human evolution as a form of primate evolution.

2. Peter Nichols, *Evolution's Captain: The Dark Fate of the Man Who Sailed Charles Darwin around the World* (New York: Harper Collins Publishers, 2003). Before you read this book, you might want to rent a copy of the 2003 movie *Master and Commander: The Far Side of the World*, with Russell Crowe. The movie takes you back to Tierra del Feugo in a sailing ship that is much like the H.M.S. *Beagle*.

3. Charles Darwin's *Voyage of the Beagle* (New York: Barnes and Noble Books, 2004), with a good introduction by Catherine A. Henze, chronicles Darwin's experiences aboard the H.M.S. *Beagle*.

4. Matt Ridley's *Red Queen: Sex and the Evolution of Human Nature* (New York: HarperCollins, 1993) and his *Genome* (1999) make for very rewarding reading.

5. If you would like to encounter the philosophic issues involved in Darwinism head-on, as it were, read Daniel Dennett's *Darwin's Dangerous Idea* (1995) since it is the most comprehensive book on the topic.

6. Lynn Helena Caporale's *Darwin in the Genome: Molecular Strategies in Biological Evolution* (2003) presents an excellent account of how genes change themselves beyond random mutations.

7. For a complete account of all of the biological forms that led to us, see Richard Dawkins' *Ancestor's Tale: A Pilgrimage to the Dawn of Evolution* (2004).

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THREE

Preparedness versus Plasticity

[I]f fewer genes meant more free will, that would make fruit flies freer than people, bacteria freer still, and viruses the John Stewart Mill of biology.

—Matt Ridley, *Nature Via Nurture* (2003:2)



One of the debates that has occupied human minds since they evolved is the relative importance of nature and nurture in human development. Recent work in evolutionary theory has undermined the usefulness of this distinction and replaced it with the concepts of 'preparedness' and 'plasticity,' the knowledge of which is required to understand both evolution and Dewey. This chapter begins with a review of Dewey's analysis of unlearned activities, which reveals our innate tendencies taken on social meaning. Note that at every stage of life, there are always tendencies already present, which is an aspect of Dewey's argument for the continuity of nature. This chapter ends with a reexamination of Kant's synthetic a priori knowledge in light of evolutionary theory.

DEWEY AND UNLEARNED ACTIVITIES

Our genes may bias the way we act, but the systems responsible for much of what we do and how we do it are shaped by learning.

—Joseph LeDoux (2002:9)

THE CENTURIES-OLD DEBATE over whether it is nature or nurture that is the more important factor in explaining behavior appears, from time to time, in philosophic discussions of evolution. For example, some of the marginal criticism of Dennett is that he is a determinist, because he puts any stock at all in the role of instinct or innate behavior in his explanations of human nature. The very hint that genetic differences in people may participate in explanations of the variance that exists in intelligence, artistic ability, and so forth receives a hostile response in some academic circles, as this is the main view that they seek to deracinate from civilized thought. As Ridley points out, there is irony in these remonstrations.

No matter that the social sciences set about reinventing much more alarming forms of determinism to take the place of the genetic form: the parental determinism of Freud; the social-economic determinism of Marx; the political determinism of Lenin; the peer-pressure cultural determinism of Franz Boas and Margaret Mead; the stimulus-response determinism of John Watson and B. F. Skinner; the linguistic determinism of Edward Sapir and Benjamin Whorf. In one of the great diversions of all time, for nearly a century social scientists managed to persuade thinkers of many kinds that biological causality was determinism while environmental causality preserved free will; and that animals had instincts, but humans beings did not. (1999:92)

Ridley is correct in that some do, in effect, prefer one type of determinism over another, but they are, nevertheless, determinists. (For the record, B. F. Skinner is a response-stimulus determinist—the reinforcing stimulus comes after the behavior; see Skinner, 1974.) In fairness to Dennett, we should note that he has argued that we evolved from the deterministic laws of physical science to the point where we became capable of free choice and taking moral responsibility. (See Dennett's *Freedom Evolves*, 2003, and chapter 6.)

As was mentioned in chapter 1, the reason that some people are more comfortable taking the nurture side of determinism over the nature side is their feeling that if we say all behavior is learned, then behavior is malleable, whereas if some behavior is innate, it is seen as fixed for all time. Further, they are worried that socially dysfunctional beliefs and conduct can be justified or excused if they emanate from innate beginnings. This species of thinking assumes, implicitly or explicitly, the blank-slate conception of human learning and behavior, which Steven Pinker has gone to length to refute in his book *The Blank Slate: The Modern Denial of Human Nature* (2002).

The difficulty with this all-nurture explanation is the fact that it must recognize that all animals possess instincts or innate behaviors that are only explained by reference to genomes and the fact that it must downplay or reject altogether the idea that humans also have instincts that are more than non-participating carryovers from our ancient past. Recall from the first chapter

that Russell's position is that once the mind emerged, the biological history of its emergence is irrelevant to what the mind does and, hence, what is true.

Dewey addressed this matter, and in so doing he showed us how to be ultranaturalists without seeing ourselves as predetermined robots controlled by our genomes. Central to Dewey's analysis of reflective thinking and conduct is the notion of *habits* that are "outgrowths of *unlearned activities* which are part of man's endowment at birth" (M14:65; emphasis added). If the unlearned activities to which he refers are innate, this means that they are coded in the DNA. Thus, Dewey claims that we do share an endowment with the other primates. Has Dewey simply sided with nature over nurture? No, because according to Dewey, "the *meaning* of native activities is not native; it is acquired. It depends upon interaction with a matured social medium" (65; emphasis in original). We give social meaning to these innate activities, which are present in the tendencies of a newborn child. When these innate tendencies emerge, they make their existence known to the child, who eventually is able to place them within a certain social context and then to take control over them. For example, consider the case of anger. Dewey says, "They are habits formed under the influence of association with others who have habits already and who show their habits in the treatment which converts a blind physical discharge into a significant anger" (M14:66). As Darwin remarks in *The Expression of the Emotions in Man and Animals* (1872):

Most of our emotions are so closely connected with their expressions, that they hardly exist if the body remains passive—the nature of the expression depending in chief part on the nature of the actions which have been habitually performed under this particular state of mind (1965:237–38). (Dewey quoted this statement in his "Theory of Emotion," 1894, E4:153, footnote 1.)

In any situation with any living thing there will always be some tendencies brought by the organism to the situation, that is, there are always *tendencies already present* in any context. Reptiles emerging from their eggs are not at a loss for actions. A baby just out of the womb is not a simply a warm version of a plastic doll. Any analysis in the Dewey tradition always begins with an investigation of these already-present tendencies, because these analyses are looking for the continuity of experience, as opposed to looking for a way to cut experience into discreet pieces. Growth, which evolution makes clear over and over again, begins with what is at hand and then continues to change it in ways that satisfy new demands. One begins to see why Dewey deserves the label "evolution's first philosopher." He alone among pragmatists and nonpragmatists is the one who saw, in its entirety, the epistemological significance of continuous reconstruction at the base of Darwin's thesis and put this insight to work in his philosophic analysis of virtually all aspects of human experience.

The conclusion to be drawn from this discussion is that there are genes at the root of our native actions, impulses, urges, or innate “discharges” that lead to or become habits only by contact with the habits of others. Dewey’s analysis shows clearly that genes only activate conduct, but the actual conduct is a function of the conduct of those with whom we associate during the formation of our own habits. Whether we are dealing with a child or an adult, there will always be impulses that come to be expressed as habits.

If we overlay Dewey’s analysis of innate behavior, or what he preferred to call “unlearned activities,” with contemporary neuroscience, we see that these unlearned activities were acquired through inheritance, and their activation produces social consequences, which, in turn, cause some synaptic connections in the brain to become more active, while many others are inhibited. What first appeared as innate behavior is rapidly, at least during the first 24 months, being built upon by the brain. This building process is fundamentally a matter of more and more neurons becoming more and more interconnected by means of the number and complexity of the synaptic connections being formed. (This idea is developed further in the following chapter.)

Neuroscience has taken us to the point where we can see that the old debate that set nature in opposition to nurture in such a way that only one could be right was seriously misguided and destructive to understanding human nature and human conduct. Such a “lawsuit,” as Dewey sometimes refers to such black or white issues, demands that we select *either* innateness *or* learning as master. But as Gary Marcus (2004:24) comments, “Learning is not the antithesis of innateness but one of its most important products.” If it is culture, as the nurture side of the debate claims, and not the genes that explain why we behave the way we do, it is because of our “ability to acquire culture,” which turns out to be “one of the mind’s most powerful built-in learning mechanisms” (Marcus, 2004:27). And, of course, if it is a built-in mechanism, its code is contained in the genome.

WHERE IMPULSES COME FROM

The difference between one individual and another owes more to differences in their genes than to factors in their family background.

—Matt Ridley, *The Agile Gene* (2003:82)

By jumping foreword in time we gain both a wider context in which to view Dewey’s thought and some perspective for evaluating how well Dewey’s arguments are holding up in the new century. Dennett goes beyond Dewey’s talk of instincts, impulses, and tendencies and claims, “Our intentionality is derived, after all, from the intentionality of our selfish genes. *They* are the Unmeant Meaners, not us” (1995:425; emphasis in original).

Many find this incomprehensible. For example, Horst holds that there are two ways to read Dennett on intentionality. Note that while his book was published after Dennett's 1995 *Darwin's Dangerous Idea*, Horst does not list this book in his bibliography, indicating that he had not seen Dennett's 1995 book before his own manuscript went to the publisher. Thus, Horst is commenting on Dennett's earlier work when he says that there are two ways to interpret Dennett.

On the strong reading, Dennett is really claiming that genes are in fact the ultimate source of intentionality—that they have intentionality intrinsically, and that everything else that has intentionality, including mental states and discursive symbols, has it derivatively. . . . This version of the Dennett move is only as plausible as (a) the claims of sociobiology, and (b) the assumption that semantic properties can sensibly be ascribed to entities such as genes. I think most readers will find these claims, especially (b) to be more than a little suspect. But there is also a weaker way to treat the Dennett move . . . Dennett's real point is that once you let in the notion of causal derivation of intentionality, there is no reason to stop with intentional states, since cognitive scientists regularly explain beliefs and desires by appeal to infraconsciousness states to which they also impute semantic properties. Perhaps the chain does not go back so far as genes, but why assume that it stops with intentional states? (Horst, 1996:68–69)

Dennett's 1995 book quoted above makes it clear that he means to say that intentionality *is* derived from the genes. Horst finds the view that "the assumption that semantic properties can sensibly be ascribed to entities such as genes" as "more than a little suspect." But Dennett's claim that "[o]ur intentionality is derived, after all, from the intentionality of our selfish genes" is actually familiar to everyday discourse. Note the use of "derived," which means that he is not saying that the intentionality of our genes is the same intentionality as *our* intentionality.

You may still be thinking that Horst is right and that Dennett's thesis is simply over the top. Actually, embracing his thesis is much easier than embracing alternatives. Consider the following example. Imagine people who want to drink milk. A biologist or their physician might tell them that their urge to drink milk possibly indicates a calcium deficiency. Our subjects do not have the intention to obtain calcium, only the intention to drink milk. The calcium deficiency explains the urge to drink milk and is in no way part of the consciousness of the person seeking milk. Being urged by our bodies to obtain more calcium may involve various tissues or organs, but these were formed by the directions coded in the genes. Moreover, since the calcium ions and molecules are in the world external to the person who seeks milk, it makes sense

to conclude that the genes do relate to these external parts of the world, which, in turn, means that *genes can have semantical content*. It also makes sense to say that the intention to drink milk is a derivative intention that traces back to the genome.

What would Dewey say about this conclusion? As we have seen, Dewey holds, in *Human Nature and Conduct* (M14:65), that habits “are outgrowths of unlearned activities which are part of man’s endowment at birth.” Dewey argues against innate ideas, but he builds his whole view on the notion that we all have innate urges, impulses, or tendencies. If such characteristics are congenital, then where did they come from? What is the mechanism that explains their existence? They are genomic in origin. The genetic explanation is actually the simplest explanation; moreover, *Human Nature and Conduct* is greatly enhanced by what we now know about the human genome. It is not difficult to imagine Dewey making references to just this point had he written *Human Nature and Conduct* in light of the last thirty years of research in biology. It turns out that Dewey’s view of human conduct is much more developed and technically correct than the philosophic writings published before him and some of what came after him. What gave Dewey this insight into human nature was his embracing the Darwinian perspective, and any philosopher who holds that human experience, both ontogenetic and phylogenetic, has continuity will find the explanations provided by Darwinian naturalism to be unavoidable.

The *expression* of these impulses is realized in terms of the habits and practices of others—in terms of one’s experience in a culture. Whether our subject who intends to drink milk looks for a cow or a supermarket is determined by the social context in which the person is living. As we give expression to these initial impulses, we may not be aware or reflective about this process, but we may come to see that these natural urges exist and that we can form habits that give them less and less sway over our conduct. The meaning of the impulse becomes reconstructed so that the meaning of these natural urges changes with our experience. For a two year old, the urge to take a piece of candy is curtailed only by the intervention of others, but when the impulse to take the candy is experienced by a more experientially mature child, the impulse is placed in perspective, and whether the candy is or is not taken has become a much freer choice. It is a freer choice because the impulse to take the candy is detected in reflection and understood or interpreted in terms of past experience with that impulse. It is thereby brought under control, because, as intense as the impulse may be, it is placed within the scheme of other wants slightly more temporally removed. We have learned to manage the innate tendencies that the survival of our ancestors have handed down to us, because we can reconstruct their meanings and place them under the influence of mind.

PREPAREDNESS VERSUS PLASTICITY

The reason that animals can learn is that they can alter their nervous systems on the basis of external experience. And the reason that they can do that is that *experience itself can modify the expression of genes*.

—Gary Marcus (2004:98)

The distinction at work today is not nature versus nurture but preparedness versus plasticity. In the latter distinction, the two concepts are not set in opposition to each other, as they are in the former. ‘Preparedness’ is the growth formula encoded in the genome that gives rise to unlearned behaviors or actions, which are quite important for as Ridley points out (in the *Red Queen*, 1992: chapter 10), things such as blinking are genetic (predisposed preparedness) because learning them would be too costly: blindness is likely to result before we get good at blinking.

‘Plasticity’ is the quality of being able to develop or learn from experience. The old nature versus nurture distinction was typically taken to mean that nature places limits on nurture; that is, effective nurturing cannot produce anything beyond what nature will allow. It is this negative interpretation that the revolution in biology has rejected. Obviously, the genome that is formed at conception is a “built in” structure within the fetus-child development. We know that this structure can build a phenotype that is amazingly flexible with regard to the various forms it can take. As Marcus puts it, “What plasticity tells us is not that embryos need experience to form the initial structure of the brain—but rather that the initial structure can be *changed* afterward in response to experience” (2004:40). In the chapter that follows we will discuss in more detail how the overproduction of neurons in the brain allows the brain to adjust to its environment. It is this overproduction that provides the plasticity that allows the advance organization of the brain to reform itself in light of its environment.

Schore (2003), who has reviewed and interpreted the research in psychobiology, concludes that “the infant is biologically prepared to engage in visual stimulation in order to stimulate its brain” (12). Further, Schore states a “fundamental principle that the baby is not only affected by these transactions, its growth literally requires brain-brain interaction and occurs in the context of a positive affective relationship between mother and infant” (13). Here we see a 21st-century restatement of Dewey’s early 20th-century conclusion that the child’s innate actions are given further meaning through social interaction that leads to the conversion of the action into a habit or consistent way of acting in given contexts. In Dewey’s time, neuroscience was not developed to the point where he would know the processes by which native actions get transformed

into habits within the social context in which they occur, but he might have suspected that the brain requires these interactions to give direction to its growth, as well as to form habits.

This presents us with an unexpected consequence. All the talk about what was and what was not included in the old concept of 'nature' (as opposed to nurture) may have overestimated the role of nature in child development, just as those who took the nurture side of the debate may have underestimated the role of nurture. For example, think of all the time between birth and 24 months that is not used in ways that would assist the development of the child's brain. If we say that brain growth is basically an internal biological process, we are underestimating the role of the physical and social context in which young brains develop. However, if we think nurture is what makes the child, we are ignoring or are ignorant of the plasticity of the brain that the genomic preparedness is creating.

Perhaps even those who vocally reject the view that they see as heavy-handed genetic determinism nevertheless assume there are internal, fungible growth processes going on that do not require (or accept) environmental inputs beyond certain nutritional requirements. Since many researchers believe that language is the most powerful component of a child's environment that impacts brain growth, parents should not underutilize language in their interactions with children.

This may sound all well and good, but many will still be worried about this appeal to the genes as instigators of behavior; that is, they fear that there is still some form of genetic determinism lurking in these descriptions. To address this concern directly, we must see how genes work. "The point here is not that genes allow us to learn just *anything*, but that whatever we do learn is made possible one way or another, by specific genetic mechanisms" (Marcus, 2004:99).

Just because a gene is in the genome does not mean that that gene will ever take part in the organism's life. Some genes are known to ride along and play no role in any process. However, for a gene to do what it does, which is to make a protein, it has to be turned on. The regulatory proteins perform this role. When a gene gets turned on it is said to be expressed. Gene expression stops when another protein is encountered that switches the gene off. So in place of worrying that the genes have complete control over us, we see that to a significant degree the genes are at the mercy of the environment, that is, the determiner of which regulating proteins are created. Note that just because a given gene is expressed does not mean that it "caused" anything. As Marcus states, "One reason that it makes no sense to talk about a gene 'for' a particular behavior is that the neural circuitry involved in producing any given behavior is far more complex than any one gene. There can be no single gene for language, or for the propensity for talking about the weather, than there can be for the left ventricle of a human heart" (2003:80).

We know, for example, that the neurons of the brain, spine, and muscles all work together in almost every case. The same is true of the genome. It is a mistake to talk about a gene for this and a gene for that. There are cases where this is true, but these are rare. As James Watson (the codiscoverer of the chemical structure of DNA) says about Huntington's disease and cystic fibrosis, "[They] are, by the standards of geneticists, simple. They are caused by mutations in a single gene and not much affected by environment. If you have the three-base-pair deletion in both your cystic fibrosis genes or more than forty CAG repeats in one of your Huntington disease genes, you will develop those disorders no matter where you live or what you eat or drink" (2003:311).

So there are, thankfully, only a few diseases that are solely the result of our genomes. In the large majority of situations, the environment is responsible for gene expression. We can now see how natural selection has created a powerful system that is both (1) built into the genome and (2) able to change the form of the brain (change the kind of brain growth) on the basis of experience.

The debate is not really about whether language is innate ("built-in") or learned; it is really about the extent to which the mechanisms allow us to learn language. . . . Whatever the "language instinct" consists of, it is not a particular language (no child is born knowing English, Hindi, or Japanese) but a particular *built-in* way of acquiring new information. Language is perhaps the most powerful example of what you can do if you are born with the right kinds of mental machinery for learning. (Marcus, 2003:30; emphasis in original)

To add emphasis to this point, note that Ridley (1999) says literacy in, say, English could come to be built into the genome if people speaking that language were placed under the right selection pressure. In other words, if reading English gave individuals significant survival advantage, it would just be a matter of time before literacy became innate. Children would be born knowing how to read.

While it is beyond the scope of this book to explore Ridley's claim, it does raise a question about the limits of the content of preparedness. As far as I know, we do not have a developed theory of the inclusion and exclusion rules for the content of genomic preparedness. This question appears again in the last section of this chapter, where Kant's view that Euclidian geometry is innate (a synthetic a priori truth) is critiqued by Dewey. Recall that Dewey takes genomic preparedness to be unlearned activities, which are innate tendencies.

What are the factors that determine whether nature decides to increase preparedness or plasticity? As Dennett says,

Different sorts of variation may happen to exist simultaneously in the gene pool, operating in two different ways:

(A) giving a leg up: starting the individual off in a state closer *in learning space* to the mature practice, so there's simply less to learn . . . ; and

(B) putting more spring in the legs: enhancing the learning capacity itself, so that the "lifting" distance is more swiftly and surely covered (this is variation in learning ability and adaptability).

Of these two opposite paths—one heading toward creating a new "instinct" and the other heading toward creating greater "general intelligence"—which will be favored? Presumably the incidental costs and benefits in each case will tip the scales one way or the other. (Dennett, 2003b:74)

And as he further points out, "we see a host of instances in which what is fixed and instinctual in one species is variable but learnable in another" (75).

As I studied this distinction, I was visited by two baby spiders no larger than the metal head of a pin (*Achaearanea tepidariorum*, I think). From the top of the Verilux lamp over my desk, they dropped down, trailing their web strands behind them. With one web strand hanging from the lamp, the spiders would climb back up the strand, move across the top of the light and drop, as if bungee jumping, while trying to catch the first strand. It was as if they were showing me that while they have considerable amounts of instinctive behavior in their genes, they, nevertheless, had to learn how to make a web, which from their not always successful attempts demonstrated that it requires considerable practice. The lamp and computer were left on all day to accommodate my sporadic writing, but the spiders appeared only when I was there clicking the keys and producing carbon dioxide. I have no idea if either of these events attracted them, or if it was something else or, perhaps, chance—but it was a less enjoyable writing session when at least one of them did not appear.

IS EUCLIDEAN GEOMETRY INNATE?

SOCRATES: And the space of four feet is made from half this line?

BOY: True.

SOCRATES: Good; and is not this space of eight feet twice the size of this, and half the size of the other?

BOY: Certainly.

—Plato, *Meno*

Socrates (Plato) held that everything we can know is inherited. When, in Plato's *Meno*, Socrates teaches Meno's slave boy proofs in geometry, Socrates saw himself as drawing out of the boy knowledge of geometry that the boy already possessed. Through a form of direct or didactic questioning, it was thought that a teacher can recover what a student knows. Socrates' view of

knowledge entails the proposition that some of what we know is contained in the genome, because that is the only way that the slave boy could have come to possess the knowledge of geometry. Socrates held that through his nurturing, this inherited knowledge could be made conscious and useable to the boy. It is remarkable how quickly children learn things, and it does seem that they are born with some knowledge or cognitive abilities.

In *Meno*, we see both sides of the nature versus nurture issue. Supposedly, nature gave the boy his knowledge of geometry, but it was not available to him without the nurture of someone who knew geometry. Today, we would say that Socrates got the balance wrong. He put the fulcrum in the wrong place. It may be that there are inherited capacities (plasticity) that make cognitive learning possible and speedy, but being taught the cognitive structures such as geometry helps one be a better geometer.

It is worth our time to consider another well-known thesis about innateness in philosophy, namely, Immanuel Kant's *Critique of Pure Reason* (1781) which presents his conception of synthetic a priori knowledge, the prime example of which is Euclidian geometry. Kant saw himself as the first philosopher to add anything to logic since the time of Aristotle. He accepts the distinction between a priori knowledge and a posteriori knowledge, and the Humean fork of analytic and synthetic statements (which has been attacked over the years by several philosophers—most recently by Harman, 1999:119–29). Kant's criticism of empiricism is that its view of nonmediated observation omits any attention to what *the mind brings to experience*. He holds that we perceive in terms of the mind's *innate* categories, which he sees as synthetic a priori knowledge. As Eric Watkins (1999:xii) puts it in his introduction to *Critique of Pure Reason*, "Kant first argues that there is a set of primitive and nonempirical concepts (which he often calls 'categories') that we must use in order to understand or grasp the world." The theorems of Euclidian geometry are proven, as most high school students know, without reference to data or observations of the world, yet they are seen as true of the world.

Consider the comments of the great ethologist, Konrad Lorenz: "The innate is not only what is not learned but what *must be in existence* before all individual learning in order to *make learning possible*. Thus, consciously paraphrasing Kant's definition of the *a priori*, we might define our concept of the innate" (*Evolution and Modification of Behavior*, 1965:44; emphasis added). Lorenz is taking Kant from epistemology into zoology and saying that what zoologists call "instinct" should be seen as synthetic a priori knowledge. Jean Piaget, known for his work in "genetic epistemology" (meaning developmental epistemology) once commented on his own work as follows: "Any epistemologist reading these lines will recognize the language of Kant (except in this case the *a priori* is a development in itself!)" (*Biology and Knowledge*, 1971:180). Piaget agrees with Lorenz but goes further and claims that the four stages of cognitive development that he identified (sensory-motor, intuitive, concrete

operations, and formal operations) are not only innate in the Kantian sense of the synthetic a priori, but the *invariant* order in which they develop is also innate.

Think back about the distinction between preparedness and plasticity. Instinct or innate behavior is preparedness. The genome of the individual contains or produces certain behaviors that prepare the individual for survival. The plasticity of the individual is the ability to learn ways of survival beyond what is provided within instinct, which is made possible by the genome. In other words, the biological basis of the ability to learn (or the biological basis of the degree of ability to learn) is determined by the genome. This point is developed further in the following chapter.

In contemporary evolutionary terms, Kant's innate mental categories that constitute synthetic a priori knowledge must be seen as preparedness, because the synthetic a priori encoded material does trace back to genetic content, as Lorenz correctly concludes. It is clear that Kant would agree that his "categories" are innate preparedness to learn about the world; thus, we have a Kantian account of tendencies already present. In his pre-Darwinian view, however, Kant sees synthetic a priori knowledge as a major part of the fixed nature of humans, but when we think of the genetic coding in contemporary evolutionary terms, we see that at various points in time, hominids would most likely possess variable genetic content, and, thus, various forms of preparedness.

Note that Kant is not saying that his categories are useful paradigms, in the sense of Kuhn's use of the term *paradigm* for understanding the world; rather, he is saying that they are the way the mind is structured; that is, that we cannot correctly understand the world in other ways. Kant's categories are not open to choice and, thus, are not political choices as are paradigms in Kuhn's analysis. Kant says, in effect, that however the world is, we can only know it by means of our mind's innate categories. But the evolutionary account of our brains and cognition suggests that any such innate preparedness was created by natural and sexual selection. Do such selections insure that whatever information gets coded in the DNA is correct information? We know that natural selection grabs on to the first thing that works, so we can interpret the above question as asking, do we know that the first kind of geometric principles grabbed onto by natural selection are ones that will serve as a basis of a formal geometry? The answer is that we do not. Why not?

The answer is to be found in Dewey's two objections to the Kantian view. "Kant's categories of the *a priori* understanding are the logical counterpart of the doctrine of independent sense-material which he took over from Hume" (L12:156). For Dewey, the difference between rationalism and empiricism is how they view nonmediated experience, which Dewey rejects in both forms. Dewey's second objection concerns Kant's appeal to Euclidian geometry as an example of synthetic a priori knowledge. Kant was aware of the existence of the non-Euclidian geometries, but he considered them as mathematical games and not suited for application in physics (Salmon, 1968:171).

Dewey says,

As long as Euclidian geometry was supposed to have direct ontological reference, the application of geometry in physics was highly restricted; when it was applied it usually led physics into wrong paths. Riemannian and Lobachevskian geometries not only freed geometry from its alleged existential reference (assumed not only by the ancients but by Kant in his theory of a connection of geometry with space and of space with an *a priori* form of conception), but in so doing, it provided instrumentalities for development of the physical theory of relativity. (L12:412)

This is a devastating objection. Dewey is saying that Kant's innate categories have misled science, and it was not until we rejected the thesis that space is Euclidian did astrophysics make progress. In Riemannian or spherical geometry, it is possible to have triangles with three right angles. (Think of a hemisphere divided into fourths. The edges of the lines that demarcate a fourth of the hemisphere are three lines that form a triangle with all three intersections creating right angles. Thus, Riemannian geometry is not counterintuitive.) In Lobachevskian or hyperbolic geometry, it is possible to have triangles with three sides parallel. (Less intuitive, right?) If you are wondering if this is possible, then you have a sense of Kant's thesis that while non-Euclidian geometries exist mathematically, they are of no value in the study of space. However, if light is bent by gravity, as the special theory of relativity claims, then what we think of as a straight line in space is non-Euclidean.

Let us say that Kant was right, and a Euclidian conception of space is innate in hominoid brains, which is conceivable since the early hominids had to come to grips with certain concepts involved in managing space and physical objects. But, as Dennett and Dawkins claim, we are not completely at the mercy of the content of our genes. In other words, our innate preparedness can be modified because of its plasticity. Even if we are born seeing space as Euclidian, we can override our innate endowment and learn to see space as Riemannian. It is not an implausible conjecture to say that there may be innate materials that become useless with regard to survival, not unlike scientific theories that are explanatorily useful for a time, but, because of discoveries, become replaced by different ones.

A better way to think about our geometric preparedness is to model it on what we know about language, that is, that some language preparedness exists that allows children to learn language quite rapidly, but there is no one language encoded in the genome. The same may be true of geometry. Recall Dewey's view that innate tendencies take on meaning because of the social context in which they emerge. This may help us further analyze what might be involved in Kant's thesis that the synthetic *a priori* categories are innate. If children stretch a string between two stakes, or if they sight down the edge of

a board to see if it is straight, they are developing a Euclidean view of space. But what if someone pointed out to these children that sighting down the edge of a board as a test for straightness will only work when the distances are small—small in astronomical terms. The person might further point out that sighting down the edge of a board is not at all like looking through a telescope and thinking of the line of sight (a path of light) between their eye and some distant star. We know that the environment can change how our brains work. Would it not be possible that such conversations about light and the meaning of straightness early in a child's life might produce students who do not see Euclidean geometry as the way their minds are predisposed to think about space? A society committed to schools whose curriculum contained what we know about space and evolution would lead to a time when philosophy students would wonder how Kant could think that Euclidean geometry is innate, when everyone knows light is bent by mass, thus rendering some Euclidean theorems invalid.

What we now know about both space and brain plasticity points us to the conclusion that Euclidean geometry is not innate, nor is any concept of straightness. What is innate is the urge to explore and to reach out to the objects (or color masses) before us in an attempt to give them meaning, that is, to understand them. This suggests that what is innate is more basic than Kant's account of innate "categories." The epistemological notion of synthetic a priori knowledge should be reconsidered in light of our current concepts of preparedness and plasticity, which would entail reconsidering both of the distinctions in terms of which the Kantian a priori is defined. Thus, we have an additional reason to believe that brain studies are fundamental to academic epistemology, as Patricia Churchland has emphasized in her book, *Brain-Wise* (2002).

Returning to the question raised by Ridley's claim that literacy could be moved from plasticity to genomic preparedness with the right selection process, it seems that literacy is of a higher form of symbolic content than is geometry. I do not mean that geometry is not highly symbolic, for the non-Euclidian geometries were discovered in the logical processes of axioms and proof of theorems. But Kant's view of Euclidian geometry as innate does not assume an already developed symbol system. This matter will be left at this point, but such questions are worth reconsidering from time to time as genomic biology continues to advance.

THE DISCUSSION THUS FAR

We see how innate tendencies are always expressed within the context of social learning. We also can now see that 'preparedness' and 'plasticity' are not simply new names for the old nature-nurture distinction. 'Preparedness' refers to the innate or instinctive behavior that is coded in the genome. Dewey's unlearned activities are

an instance of what today we are calling 'preparedness.' 'Plasticity' refers to the ability to learn from experience. Humans possess instinctive behavior, but their survival depends, with few exceptions, on their ability to learn, which is made possible because of their brain plasticity. It is the anatomy of this plasticity to which we now turn. Readers less interested in the science that further supports Dewey's approach may want to go directly to chapter 5.

CONSIDER READING

1. To pursue further Dewey's analysis of innate activities, see his *Human Nature and Conduct* (Middle Works, volume 14). I think this book is more important in understanding Dewey's thought than is typically reported by his reviewers.

2. Steven Pinker's *The Blank Slate: The Modern Denial of Human Nature* (2002) says about all that one could say about the inadequacies in the blank slate view of human development.

3. Matt Ridley's *Nature via Nurture* (2003) addresses the traditional distinction in light of the new research in biology and makes it clear that our genes are controlled to a high degree by the environment. This book was published in paperback under the title *The Agile Gene* (2003).

4. Gary Marcus's *Birth of the Mind* (2004) presents explanations within neuroscience that are directly related to the topics of this chapter. This book shows how human brain growth is influenced by its environment in more ways than were previously suspected.

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FOUR

Brain Development and the Emergence of Mind

The world becomes full of organisms that have what it takes to become ancestors. That, in a sentence, is Darwinism.

—Richard Dawkins, *River out of Eden* (1995:2)



Studies of the human brain reveal a remarkable plasticity to develop biological tissue while at the same time leaving open the possibilities that postnatal survival might require major changes in the initial constructions. We will consider the basic biology and then examine, albeit briefly, how brains become minds. Dawkins' idea of memes is introduced along with Dennett's explanation of how brains evolved. Readers who do not want to review brain science nevertheless may be interested in Dennett's serial-computer theory of mind. Readers familiar with Dennett's writings may want to skip over this chapter.

THE TRIUNE VIEW OF THE BRAIN

One wonders whether the limbic system would ever have become such a “solar plexus” with respect to emotional feelings if it had not been for the development in mammals of the family unit dependent upon the nursing mother.

—Paul MacLean (1985:220)

PAUL MACLEAN'S BOOK *Triune Brain in Evolution* sets out a theory that the human brain can profitably be seen as having three basic parts that are distinguished on the basis of the brain's evolution (McLean, 1991). If we think of the spinal cord as a walking stick, the earliest brain may be envisioned as the silver or brass knob on the end of the walking stick. This earliest brain is typically referred to as the "*reptilian* brain" (or the R-brain) and is also known as the *archipallium* (*archi* "first or basic," and *pallium* "brain"). The R-brain form is at least 200 million years old (Hart 1983:36), and controls the autonomic nervous system, as well as decisions, among other things, about whether to fight or take flight. If you were to view the skull of an alligator or other reptile, you would notice that the brain case is very small. Zoologists will be quick to point out that the reptiles have all the brain they require to live their life style.

The second brain identified by the triune theory is the middle brain, also known as the *paleomammalian* (paleo "old," *mammalian* "mammal") brain, which is 60 million years old (Hart 1983:36). McLean (1991) refers to the middle brain as the "limbic system," which includes the amygdala, hippocampus, and hypothalamus. It is believed that the limbic system is responsible for our feelings of hunger and thirst and controls our emotional states. Continuing with the walking-stick analogy, imagine that the silver knob is covered with foam padding several inches thick. This paleomammalian brain is roughly sixteen times as large by volume as the R-brain.

The third brain of the triune theory is the large human brain, the *neocortex*, or the *neomammalian* brain, and is only a few million years old. It is this neocortex that is divided into the much talked about left and right hemispheres that are connected by a bridge between the two, the *corpus callosum*. The *corpus callosum* is wider in women than in men, a fact that has led many to wonder if it could form the basis of the differences in observed behavior in men and women.

A pattern we see used over and over again by evolution is the using of older structures in new ways. Brain studies show us that nature, by adding on to the old and/or putting it to work in new ways, has produced evolutionarily different forms. For example, we still retain the flight or fight interpretation of situations in which we find ourselves, but with the added computing power of the neocortex, we are able to better manage our more basic flight or fight impulses. We have all been in situations where we imagine throwing a book, or even a brick, at someone; but our higher executive function—our logical reasoning—found in our new, human brain inhibits this lower level urge.

THE BRAIN AND INFORMATION PROCESSING

[T]he microprocess by which a given neuron's activation level is conducted across any synaptic gap, in order to stimulate or inhibit

its target neuron at the next population, is a microprocess that is biochemical through and through.

—Paul Churchland (1995:169)

To gain some understanding of how the brain processes information, we should review the form of neurons or nerve cells that make up the brain, since they are the basic elements in thinking and remembering. Consider the stylized drawing in figure 4.1.

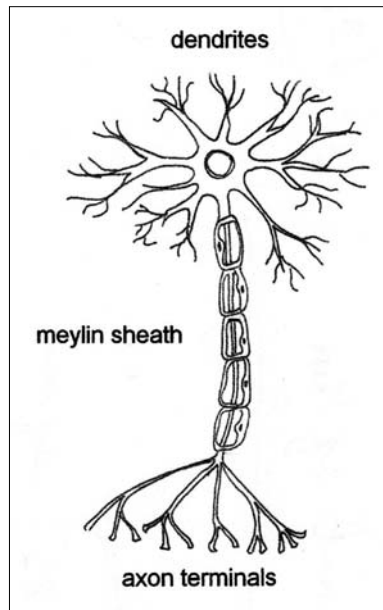


FIGURE 4.1
Neuron

The top of the figure shows the branching of the dendrites from the cell body. On each dendrite is a structure that one researcher referred to as “spines,” as they reminded him of the thorns of a rose stem.

The axon of the neuron is covered by *myelin* cells that form the myelin sheath or the white material. The nerve tissue within the sheath is the gray material. The axon branches into the axon terminals, and as noted, the terminals take the form of knoblike structures that constitute one side of the synaptic gap, the other side of which is formed by the dendritic spines. Thus, neurons articulate with each other by establishing relationships among axon terminals and dendritic spines. One neuron may be related in this way to a

thousand other neurons. Hundreds of these cells have their axon terminals related to a given cell's dendritic spines, and the given cell's axon terminals may relate to hundreds of other cells' dendrites. If a thousand cells are each related to a thousand other cells, we have at least a million synaptic gaps.

The flow of information is from axon terminals to dendritic spines. Each axon terminal mates up with one of the spines, which appear under magnification to look more like leaves or flower buds than they do rose thorns. Fascinatingly, the axon terminal and dendritic spine do not actually touch each other, which, as we have been saying, creates the gap. So how does information cross the synaptic gap? There are vesicles in the axon terminals that release certain chemicals that cross the gap and are received by the dendritic spines by means of its various receptors. Such chemicals are *neurotransmitters*, the more famous of which are *serotonin* and *dopamine*, but there are well over one hundred more (see figure 4.2)

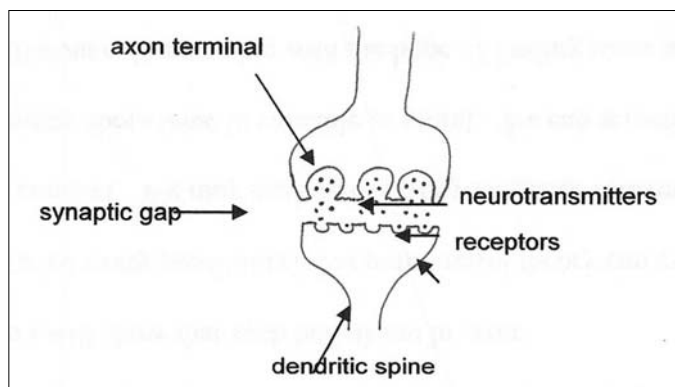


FIGURE 4.2
Synapse

There are pharmaceuticals known as serotonin reuptake blockers. Serotonin is released by the vesicles in the axon terminals, flows across the synaptic gap, and is reabsorbed by the spines by means of serotonin receptors. But some of the serotonin in the synaptic gap may be reabsorbed by the axons. This does not matter, except for situations where either one's axons are not producing enough serotonin or where there are not enough receptors on one's dendrites. Serotonin is the neurotransmitter that gives us a sense of well-being, and when we are deficient in serotonin, we become depressed; so, in order to keep more of one's serotonin available to the dendritic spines, the serotonin reuptake blocker prevents the serotonin from being reabsorbed by the axon terminals from which it came originally.

From the standpoint of cognitive science, all the thinking that you do and all of the remembering you have of how various people looked at given events, houses you lived in, and all of the other memories that constitute your experience exist because of, and by means of, neurons and their synaptic relationships. All of our cognitive functioning is made possible because of molecules and electrical charges.

NEURON ELIMINATION

Three of the main tenets of neural selectionism are described by the terms *exuberance* (more synapses are made than are kept), *use* (the synapses that are kept are the ones that are active), and *subtraction* (connections not used are eliminated).

—Joseph LeDoux (2002:74)

At the beginning of postnatal life the brain engages in a very fast rate of growth that continues until the child is 18 to 24 months old. During this period, the brain “structure is literally being built on a daily basis” (Schore 1994:10). As Schore continues, “the vast majority of the developmental axons, dendrites, and synaptic connections that underlie all behavior is known to take place in early and late human infancy” (1994:12). “There is no doubt that the dendritic growth and synaptogenesis of the postnatally developing brain is ‘experience-sensitive’ . . . and ‘experience-dependent’” (12). At least 5/6 of the brain is built during this period of accelerated growth, which researchers refer to as the “critical period,” because it is during this time that the brain is readily influenced by the social environment. (See Schore (1994:11) for many studies that support this conclusion.)

It is well documented that the infant’s brain produces many more neurons, and thus, dendrites, axon terminals, and synapses than will be required for early and later life. This overabundance of synaptic connections provides a high degree of plasticity for the brain in that as the child encounters life, some of these synaptic connections will lack relevance to the tasks that the brain is being required to perform and are pared back accordingly. As LeDoux points out, “Building the nervous system in this fashion is thought to provide a means of coping with the paucity of information available to the brain from other sources, such as the outside world, during early development” (2002:74).

As the brain develops further and encounters the world, the overproduction of neurons allows the brain the opportunity to become one kind of brain rather than another, depending on the areas in which it eliminates those excess neurons. In other words, our brains delayed certain decisions about what their final form would be so that they could better adapt to the environment in which they would have to function. How does the brain accomplish this remarkable feat?

While there are likely many more processes at work in the brain than we now know, there is a fascinating one that does explain some of how the brain can adapt itself to the environment in which it is developing. We know that the physical environment can influence the brain; for example, a child deprived of oxygen will suffer brain damage, just as will children who ingest paint that contains lead. Moreover, physical growth requires the building materials that we refer to as good nutrition. However, we tend to pay less attention to the effects of children's psychological environment on their cognitive growth.

B. D. Perry concludes, in his paper "Traumatized Children: How Childhood Trauma Influences Brain Development" (2000:48–51), that children's brains, within the limits of their genomes, reflect the environment in which they grow up. The brain develops in such a way that it can "change in response to patterned, repetitive stimulation," which enables the brain to "reflect aspects of the quantity, quality and pattern of the somato-sensory experiences of the first years of life." He points out that children's brains have "an amazing adaptive malleability" that allows their brains to take the forms that are best suited to their survival by developing according to the social environment of which they are a part in the early part of their lives. "If that world is characterized by threat, chaos, unpredictability, fear and trauma, the brain will reflect that by altering the development of the neural systems involved in the stress and fear response." It turns out that we know something about what these changes are.

If a child enters the world in a place where survival itself is a daily issue, then in general terms, fighting or fleeing are going to be activities that are frequently engaged in. There will be heavy neurological traffic in the synapses of the R-brain. The better that one is at defending oneself by counterattack or flight will depend on how numerous and functional the synaptic connections are in that area of the brain. These survival activities will be producing high levels of cortisol, which in turn will be detrimental to the neurons of the brain. While the neocortex will receive most of the damage, the R-brain is not free from diminishment. But the obvious overarching conclusion of all of these studies is that parents and caregivers should not be creating social situations for children from birth to 24 months that produce high levels of cortisol. Moreover, even after the critical period, stress can still do harm to the brain. There must be a hundred studies in the literature that report that stress diminishes the hippocampal area of the brain. J. D. Bremner, in his paper, "The Lasting Effects of Psychological Trauma on Memory and the Hippocampus" (2002), reports that "combat veterans were found to have an 8% reduction in right hippocampal volume, measured with magnetic resonance imaging (MRI), with no difference in comparison regions including caudate, amygdala and temporal lobe." Other studies have found that the hippocampus does produce new neurons, but the production is slowed or stops during periods of high stress.

When the hippocampal region of the brain is reduced or damaged, what price do we pay? The hippocampus is part of the limbic system that creates emotional states and mediates emotional urges and drives. Moreover, many research studies have shown that the hippocampal region plays an essential role in memory and learning. The hippocampus is not the storage location for memories, but it does assist in memory by associating emotion with the factual content. When the hippocampus is damaged by stress (from a chemical such as cortisol), the ability to recall information is lowered, and one's ability to learn new information is also diminished.

Stress, in the short run, as Ridley (1999:149) points out, causes the production of epinephrine and norepinephrine, which are hormones that get us ready for a fight or a quick escape. If the stressful situation or environment lasts much longer, then a different process is set in motion—the production of cortisol. “One of cortisol’s most surprising effects is that it suppresses the working of the immune system.” This happens because our white blood-cell count is lowered by cortisol, which is sometimes referred to as the “fight or flight hormone” since it helps the body put sugar into the bloodstream for energy.

The hypothalamus of the brain sends out a signal that tells the pituitary gland to release a hormone that tells the adrenal gland to make and secrete cortisol. The hypothalamus takes its orders from the conscious part of the brain which get its information from the outside world. (Ridley, 1999:151)

Cortisol is an anti-inflammatory hormone found in every one of the body's cells and is the hormone from which the familiar drug cortisone is derived. When placed under sustained stress, the body produces larger than normal amounts of cortisol, which, in the case of children, has a great impact on how their brains develop.

At the other extreme, if the child is born into a place in the world where fighting or fleeing are never required activities, but where understanding and explaining are the activities in which one engages, then it will be the synaptic connections in the R-brain that will be pared back to a greater extent than the other two areas of the brain. Since, in this social context, high levels of cortisol will not be produced, there will be less damage to the brain cells, and it may be that while the number of synapses in the R-brain is reduced, there may be less damage to the remaining neurons.

You might be wondering what would happen to a child who is born into a situation where both the child and mother are engaged in the struggle for survival, and then the child is placed in a social environment where the activities encountered require higher levels of cognitive functioning and no fleeing or fighting. Could this child function in this alternative environment? There is evidence that early damage to the brain by environmental stress is repairable

if the child is placed in an environment where stress is minimized and positive elements such as affection are present. Some researchers (Koo, et al., 2003) have concluded that even though children of mothers who experienced stress during pregnancy “display long-term behavioral abnormalities throughout life, including structural and morphological changes in the brain,” these effects can be counteracted by removing the sources of the stress and providing a more positive environment for the child. Thus, it seems that to some degree it is possible to decrease “some cognitive impairments induced by prenatal stress.” The fetal brain has mechanisms for using data from the mother’s social environment in order to preform itself so that when it enters that environment, it will have an improved chance to survive. However, there is some evidence that if the changes made in the brain prior to birth are not as well suited to the environment the child encounters, there remains some degree of flexibility available to make beginning course corrections.

In the discussion above, we considered what might be called the “book-ends” of the neonatal environment. While there are many children who experience one or the other of these extreme situations, there are many more whose experiences are mixed, in the sense that there are good and bad days, high- and low-stress days, or heavy and light cortisol-producing days. The researchers cited above found that even in extreme cases, the brain can grow new neurons and form more synaptic connections. In the less extreme cases of daily stress, some repairs are even more likely.

To summarize, as researchers point out, the few months before and a few months after birth is a period of rapid brain growth. More neurons are created than will be used, and the unused neurons are pared away. Fortunately, for children who experience less than optimal conditions in their first few years, researchers have some evidence that the brains of these children have the ability to make some corrections as to how the neurons are allocated to the various brain areas. From our beginning understanding of the neuron and synapse allocation processes, we can see how people with very similar brain-making genes can develop very different personalities. Another dimension of these processes requires the concept of ‘memes,’ to which we now turn.

THE THEORY OF MEMES

Mememes, like genes, are potentially immortal, but, like genes, they depend on the existence of a continuous chain of physical vehicles. . . . Minds are in limited supply, and each mind has limited capacity for mememes, and hence there is a considerable competition among mememes for entry into as many minds as possible.

—Daniel Dennett, *Darwin’s Dangerous Idea* (1995:348)

Richard Dawkins (1976 and 1982) introduced the notion of a meme to help better explain both the evolution of the mind and culture. Just as genes explained biological growth, Dawkins hoped to show that memes could explain the growth of culture and of mind. His basic idea was to identify what have been called “second replicators,” which, like genes, are subject to natural selection. But, as Dennett observes (1995:361), Dawkins backed off of the original thesis that, with respect to natural selection, memes are exact parallels to genes. Dawkins concludes (1982:112) that he does not know enough about cultural development to pursue the thesis that memes explain cultural growth the way that genes explain biological growth. Nevertheless, Dennett holds that the concept of memes is useful in explaining the development of the mind (1991; 1995; 2003). He does not claim that memes follow exactly the path of genetic evolution, but he does hold that memes are important ideas for explaining the evolution of the mind. For Dennett, a meme can be a concept or information. His examples are concepts (such as ‘wheels,’ ‘vendetta,’ or ‘calendar’) or information, (such as how to make a pot or an arch) (1991:201–02; 1995:344), and are “the smallest elements that replicate themselves with reliability and fecundity” (1995:344).

One of the reasons that Dennett does not simply talk about concepts or information without bringing memes into the discussion is that memes, in a sense, have a life of their own, which is independent of our will or volition. We do not always make a deliberate decision to think a specific thought. Musical scores, mental pictures, old conversations often unexpectedly “come to mind.” We might ask ourselves: why did I suddenly think of that? Is it somehow associated with a previous thought? But I do not remember having a previous thought. All my concentration was on how to stop the word processing program from drawing horizontal lines across the page. How could that have led to my thinking of this or that?

As often happens, we see, hear, or read something that seems to get in our minds even though we did not encourage it and in some cases would very much like to forget it. (Radio and television advertisement jingles are intentionally constructed to achieve this very effect.) A few years ago, the BBC placed a story on its web site that discussed what some are referring to as “brain itches” or “ear worms,” songs that take over our consciousness and that are difficult to expel (BBC, 2003). This indicates why Dennett thinks that memes have a replicative quality that sometimes goes beyond, or is not dependent on, our explicit decision making. Even when we deliberately recall a specific bit of information, other bits often tag along, which seem to have no substantive relationship to that which was recalled. In other cases, replication is deliberate, as when we try the latest dance step, listen to a new music craze, read a book from the *New York Times* best seller list, or go to see an Oscar-nominated movie. All of this investigation into genes, memes, and natural selection gives us what Dennett calls “a naturalistic framework with which the

traditional questions of morality can make sense” (Dennett, 2003:268). Ultra-naturalism claims that only through evolutionary explanations can one build an ethics or epistemology. Dennett thinks that the theory of memes can throw new light on both the explanation of *Homo sapiens*’ development of a large brain and the evolutionary explanation of culture. The reason that Dawkins and Dennett bring up the notion of memes is to explore more explicitly how culture influences the development of mind. While Dennett doubts that a science of memetics will ever develop, he nevertheless holds that “the concept provides a valuable perspective from which to investigate the complex relationship between cultural and genetic heritage” (1995:369; 2003:177).

Not everyone agrees that the concept of memes is worth considering. Heschl, to take a recent example, holds that “in principle, Dawkins’ meme theory, viewed heuristically, is not much more valuable than any astrological or otherwise esoteric interpretation of the meaning of the universe and its inhabitants” (2002:144). Some readers may agree with him and wonder why Dennett appeals to the notion of memes, when he could just as well present his theory without all the meme talk. Dennett’s reply would be that the notion of memes forces us to look at culture in a different and unfamiliar way. He holds that the meme analysis of culture gives us “a perspective or point of view from which a wide variety of different empirical claims can be compared . . . in a neutral setting that does not prejudge these questions” (2003:179). With new insights into the evolution of culture, we may develop an increased understanding of the nature of freedom.

I think we can go further and claim that the idea of memes gives Dennett more than the ideas and concepts ubiquitous in the philosophic literature. The fact that memes can circumvent the explicit choice of an individual insures that there will be a wide range of memes within the brains of each person in a given culture. In other words, the spread of some memes within a group occurs without individuals making explicit, reflective value judgments about the memes being transmitted. Dennett could have put this argument in terms of, say, “ideas that have, in a sense, a life of their own,” but the notion of memes already has this characteristic built into it. Given that all *Homo sapiens* possessed a large number of memes, there would have been evolutionary pressure exerted on the development of a way of managing these memes, which, of course, Dennett is arguing is the emergence and development of mind.

Memetic engineering was going on long before the recent appearance of genetic engineering. Sales people and, of course, political campaigns are in the business of memetic engineering. Dennett cautions us that “it is a mistake to *assume* that the natural selection of a cultural trait is always ‘for cause’—always because of some perceived (or even misperceived) benefit it provides *to the host*” (2003:177; emphasis in original). Buying lottery tickets or smoking are familiar cases.

Talk of change or of being “change agents” is not always talk about improvement. Change, even change for the better overall, is always destructive to some of what existed before the change. What philosophy has not done so well is to show the world that even desirable change destroys some of what was desirable. It is rare change indeed that destroys *only* what was undesirable. For example, Dennett cites the introduction of the steel ax into the culture of the Panare Indians of Venezuela. The cooperative experience of getting together with stone axes to fell trees to make a garden has been supplanted by the efforts of one person, who can easily clear the area by himself. In both cases (and many more within the literature) these changes represent losses of traditions that will never appear again.

Susan Blackmore (1999) presents a more complete explication of Dawkins’ ideas about memes (his meme meme). Genes are found in the cells of living things and provide a recipe for making proteins. This recipe is passed on to progeny through reproduction. A meme, which is found in the brain (or in books or on the Internet), is, according to Blackmore, a set of instructions for doing something and is passed on to others by *imitation* (1999:4–8, 47–52, 66). Just as with the difficulty of giving a strict definition of the term *gene* (we know it is a piece of DNA, but different researchers still use the term differently), she sees the exact limitation of just what is and what is not a meme as far from clear (Blackmore, 1999:53–54). Her emphasis that memes can only be replicated by imitation explains how memes could be transferred in the very early days when language was still in a primitive state. If we hear a song on a car radio or from a movie, we may find ourselves imitating the tune over and over. She also cites an example in the following account: In England it was discovered that some birds were pecking at the top of milk bottles to get at the cream. This phenomenon was observed in one locale but spread rapidly through the island. One bird may have discovered through trial and error that pecking the top of the bottle had a definite payoff. Other birds observed this pecking behavior and imitated it. The observer birds already knew how to peck. What they came to imitate was the pecking on a particular object that they had never pecked before. There were most likely human cases of imitation that spread the creation and management of fire, cooking meat, and so forth (1999:48).

It seems that one can imitate consciously or unconsciously. If we observe someone using a very effective technique, we may try to replicate the action and thus replicate the meme. As it was previously noted, the imitation of fire making and specialty tools was very likely how those memes disseminated. Today, one of the most obvious features of television is its role as meme distributor. The main point to remember is that for Blackmore, a meme is a set of instructions to do something. The set of instructions must be capable of *replication* through imitation, exist in ample *variations*, and be subject to some *selection* process. Dennett sees memes in a less restricted sense. For him memes

are concepts that are replicated by people copying them into their minds. He seems unconcerned about seeing memes as second replicators.

In *The Ancestor's Tale*, Dawkins addresses the question as to “the exact role of memes in the evolutionary swelling of the human brain” (2004:272). His answer is as follows: “There are genetic variations in brains which would remain unnoticed without memes to bring them out into the open.” He gives the example of musical ability. “In a world full of musical memes, genetic differences in musical ability shine through and are potentially available for sexual selection.” There are many potential abilities that exist in a given population of people that may never be realized without acquaintance with a specific instance that *calls them out*, as Dewey would put it. Children who have never been to an art gallery or seen an actual painting may observe a person painting a landscape, for example. The notion of expressing their own idea in oils, acrylics, or watercolors may take root in some brains and not others, and in those that it does take up residence, a wide range of ability may present itself. If the meme was wood or stone carving that found a home in a certain group of people whose metaphysical beliefs held that making images of people or animals was a good thing to do, this meme could be responsible for redirecting the path of evolutionary development of the brains within that particular group. It is in these kinds of cases that memes do seem to have a role in evolutionary explanations.

FROM CONSCIOUSNESS TO MINDEDNESS

For 'tis the mind that makes the body rich.

—Shakespeare, *Taming of
the Shrew*, Act IV, Scene iii

According to Dennett, the best way to think about consciousness is in terms of memes. In *Sweet Dreams* (2005:168), he refers to his “notorious claim that human consciousness is largely a culturally borne ‘meme machine.’” Memes, some invited and some not, inhabit our brains, and when we develop the ability to manage them effectively, at least to some degree, we are conscious. Some neuro-scientists think of consciousness as many neurons coming to function in unison, pulling together, as it were. Dennett and the other philosophers are not directly concerned with how the biology is organized as much as they are with describing what this biology is producing, which leads them to describe in cognitive terms what the mind is. Note that Dennett’s reference to consciousness as a culturally borne “meme machine” does not reference biology or cell function. There have recently been over twenty books and many more articles, in one way or another, devoted to the analysis of consciousness, so there is no way that this short discussion can do much more than point out

that Dennett, at least, considers the notion of memes as a good basis for understanding consciousness.

We know that animals are both intelligent, in that they are good at pattern recognition, and conscious in some sense of the term. For example, children come across a squirrel lying motionless under a tree. One child asks, "Is it dead?" Another says, "No, you can see him breathing." The first child says, "He must be unconscious. Maybe he fell out of the tree." He moves the squirrel gently with a stick. The squirrel suddenly stands up, looks around, and scampers up the tree. The child's use of *unconscious* was appropriate. Animals can be "knocked" unconscious, which means that they were at some time conscious. Being asleep is like being knocked out, but without the brain damage. But it does seem correct to say that the squirrel was conscious, lost consciousness, and regained consciousness. Dennett would have no problem with that way of putting it, but he would point out that our consciousness is not the same kind (type, level) of consciousness of the squirrel. My way of putting it is our consciousness *developed a mirror*, and the reason it has this ability to see itself is because brains loaded with memes require some executive function that can oversee the management of these memes, which is a kind of reflection upon one's experience.

You can see how readily the plot thickens, as well as the impotence of first philosophy or the ordinary language analysis of "consciousness," the conclusions of which one expects will be woefully garbled (see Popp, 1998: chapter 3). It is in the pursuit of an explanation of our consciousness' ability to see itself that memes are brought into the discussion. Even if there is some doubt about the wisdom of so doing, it is nevertheless clear that there are such things as memes and that it is the task of the brain to manage them as best it can. Again, philosophers can talk about memes without knowing how the brain stores them and retrieves them, but the naturalistic philosophers will say that if we had a thorough understanding of this process, it would likely help us further explain the nature of consciousness—at least if you side with Dennett on this matter.

Dennett's view of consciousness as meme management indicates that consciousness is something that we *do*. I want to go one click further and consider how Dewey talks about consciousness. As one would expect, Dewey refers to consciousness throughout his writing, but the following statement is a good summary of his thinking. Also, as one would expect, consciousness is closely associated with action. Note that I am making no claims about Dennett's and Dewey's ideas about the nature of consciousness beyond the weak claim that they are not obviously incompatible.

We are only too given to making an entity out of the abstract noun "consciousness." We forget that it comes from the adjective "conscious." To be conscious is to be aware of what we are about; conscious signifies the deliberate,

observant, planning traits of activity. Consciousness is nothing which we have which gazes idly on the scene around one or which has impressions made upon it by physical things; it is a name for the purposeful quality of an activity, for the fact that it is directed by an aim. Put the other way about, to have an aim is to act with meaning, not like an automatic machine; it is to *mean* to do something and to perceive the meaning of things in the light of that intent. (M9:110–111; emphasis in original)

It is clear that Dewey does not believe that being conscious is to be in a passive state. To characterize consciousness, Dewey uses “deliberate,” “purposeful,” “mean to do,” and “intent.” We are conscious when we are deliberately and purposely pursuing some goal or end. He is not saying that we are simply conscious of what we are doing; rather, we are conscious *because* of what we are doing. Imagine that you are sitting on the beach facing the setting sun. You may be unconscious of the reddish glow before you, not because you are asleep, but because you are not trying to do something. You hear someone say, “What a beautiful sunset!” Your awareness is activated, and you look toward the horizon to see its rise slowly blocking the view of the sun. You made an effort to observe the sun and the colors that are produced as it is screened by the earth’s rotation. You became conscious of the sunset because you tried to observe the sunset. That consciousness was created by the desire to see what was being talked about by others.

Dewey once remarked that philosophy emerged when thinking became conscious of itself, which means that at some point humans became conscious of their thinking and began to think about their thinking. This, in turn, led them to formulate the problem of the normative, which we will consider in the following chapter. For now, it should be noted that language and sexual selection are likely the best explanations for the evolution of human brains—brains that can generate minds.

“Culture and cultural transmission can exist without language, and not just in us hominids, and in chimpanzees, our closest surviving relatives, but it is language that opens the floodgates of cultural transmission that sets us apart from all other species” (Dennett, 2003:174). The important question for evolutionists is how to explain why we developed larger brains and language, while the great apes did not. As Dennett has just pointed out, it cannot be culture alone that explains these differences, because culture exists in many species.

One view holds that as more and more cultural content accumulates—medical treatments, hunting techniques, tool making—more and more demands are placed on the brain. Success in the hunt may require some sort of hunting agility, which in turn requires that one develop effective psychomotor skills rather quickly. Natural selection will produce better and better hunters, if there is competition with other hunters. Hunting skills are not

passed on to children genetically; what is passed on genetically, that is, replicated, is the agility of the brain to quickly develop the requisite psychomotor connections. We would expect that successful hunters will have more children than less successful ones. The actual hunting skills are passed on to children through social learning. As hunters become more efficient, there may be less and less need for hunters, but the better developed brains are present in the culture as resources, to be set to different tasks.

Dennett holds that the evolution of cultural interactions paved the way for language. To have language appear in the history of a species, we have to have a "community of sorts, with norms, and traditions, and recognition of individuals, and mutually understood roles," to use Dennett's list (2003:173). Hominids who formed effective cultures would have been more likely to have and protect their children. It is the development of language that creates the gap between *Homo sapiens* and other intelligent animals. As Darwin says, "A great stride in the development of the intellect will have followed, as soon as the half-art and half-instinct of language came into use; for the continued use of language will have reacted on the brain and produced an inherited effect; and this again will have reacted on the improvement of language" (1997:633).

We can see how natural selection is functioning within Darwin's description of language users. In any such group, there are variations in brain function, which in turn will produce variations in language ability. Those members who are able to make the best use of the language tool become models for others, who attempt to imitate them, because in the various survival activities in which the group must engage, the best language users will be the best coordinators or leaders. As Darwin suggests, language competence is not inherited, but having a better language-processing brain is. Once the conditions for language exist, and language begins to emerge, hominids become persons, because, as Dennett (2003:173) says, their brain becomes a "host to millions of cultural symbionts," which are activated by language.

Both Darwin and Dennett believe that the reason why *Homo sapiens* have brains much larger than the other primates is because an increase in brain size was required by the development of language. In fact, everyone seems to agree that the large hominid brain evolved because of selection pressures on language. As language improved, selection pressure produced larger brains, which in turn made better and better language skills possible. We have a kind of circle of improvement. But what set the circle in motion in the first place? Why did the great apes not develop in this way? Was it sexual selection?

Some writers reject the "tool-maker" explanation of the development of the large hominid brain because they hold that sexual selection is a more adequate account. Just as the pea hen's preference for large colorful tails on peacocks has increased the size of the males' tails, even to the point of it not being in the best interest of the male to have such a large tail, women's preference for mates might have been for those men who were proficient (or more proficient)

in language or, perhaps, certain kinds of language. In other words, if women preferred men who could talk in ways that were both (a) seductive, and (b) indicative of a potential father who would provide for the family so that children would survive, then these women would be placing selection pressure on language ability. If the males with good language skills and concomitantly large brains are selected by females, then their offspring will also have larger brains. Since some of the children will be daughters, women will also tend to develop larger brains, which means that, unlike the peahen, women's choices of sexual partners is reflective. So the women's preferences for better language ability would have been (and are now?) an instance of Darwin's unconscious selection for larger brains. (For more detail about sexual selection as an explanation, see Ridley, *The Red Queen*, 1992.)

THE MIND AS A VIRTUAL MACHINE

The invasion of human brains by culture, in the form of memes, has created human minds, which alone among animal minds can conceive of things distant and future, and formulate alternative goals.

—Daniel Dennett, *Darwin's Dangerous Idea* (1995:369)

Having briefly referred to Dennett's views of consciousness and mind in the preceding pages, I think we owe it to him to give a short overview of his thesis. A *real* machine is a device that operates according to a set of rules (an algorithm) to process input material and output a specific result. Familiar real machines are the steering mechanisms of automobiles, pinball machines, or desktop computers. A *virtual* machine, however, is a machine that only exists in, and operates by means of, a set of rules that are implemented by a real machine. For example, there are the familiar real pinball machines that launch real balls. These are pushed about by various elements of the machine, including "flippers," controlled by real buttons found on either side of the machine. There are also virtual pinball machines that run on our PCs. The look and sounds of the virtual pinball machines are the same as the real machines, except that in place of the spring-loaded ball launcher and the flippers, there are computer keyboard keys or game controllers that perform these functions. If the virtual machine is well built, the virtual pinball will behave in ways that closely imitate the behavior of the real (metal) pinball.

Slide rules, which were once indispensable calculating tools in science, are *analog* machines because they represent and manipulate quantities by means of distances. The scientific calculators now found in science labs are *digital* machines, because they represent and manipulate quantities by means of symbols. This is the same distinction as the older music records that were played

on a turntable, as opposed to CDs that are played on, for example, disk drives. Desktop computers are real machines that run the familiar virtual machines, Word, and Excel. One of the values of the digital computer is its ability to “run” numerous types of virtual machines.

Dennett’s argument at this point is very interesting. While our real machine is our analogical, massive parallel processing brain, (inelegantly known as the “meat machine”), the virtual machine we call our mind runs on that biological architecture. Just because we have a brain that is a parallel processor, we are not prevented from running a serial-digital program. Dennett’s basic argument is that the brain is a real analog machine that provides the massive, parallel architecture that can support the virtual serial, digital processing machine that is our mind. The interface, to use computer talk, between the biological brain and the virtual symbolic processor is provided by the memes.

As Darwin makes clear in his writings, evolution is always using what was selected as the result of one set of circumstances, as a way to struggle effectively within another set of circumstances. The ability of organisms to invent new ways to solve new problems explains how we made it from being mushrooms to being thinking readers and writers. Dennett claims that while the primate brain was developed to deal with managing simple decisions, it became possible for that same brain to support a digital virtual machine. This makes Dennett, in the language or labeling of cognitive science, a “computationalist,” that is, one who views the mind as a virtual digital computer, running on massive parallel architecture. There are other computationalists who disagree with Dennett’s account of computationalism, but I will not fully develop their objections, not because I want to suppress dissent, but because they ignore the ultranaturalism requirement that all elements and processes that make up the mind be given evolutionary explanations.

Let us be clear on the point that Dennett *is not* applying the serial digital computer model to the traditional philosophic problems of thinking or the nature of the mind in the way that one looks at confusion and tries to import some highly organized frame of reference to make sense of it all. He is not presenting an analogical argument! Rather, he is using the Darwinian approach to explain how the cognitive abilities of *Homo sapiens* evolved beyond, but by means of, the form of primate brains. The philosophic problem for evolution is to explain how human intelligence was built out of biological elements that evolved to solve other problems. Culture and language made memes possible, and the interaction among memes became structured in ways that took the form of primitive, serial digital computers.

This view may seem far-fetched, if you are encountering it for the first time, but it is less radical than you may think. We know our brains came from the hominids, who survived the struggle for existence by means of their massive parallel-processing brains. We know that culture and then language developed, first as sounds and crude marks, and then into the various written

and spoken languages we find around our world. A written language is a highly symbolic system in which the symbols represent elements of the world (real and imagined) and their relationships. Dennett is saying that it is simply a fact that our parallel processing brains are thinking in terms of these highly symbolic systems. We do it and see it and hear it every day. But the question becomes, how do we explain this fact?

The Dennett theory is that these small packages of meaning, memes, take up residence within our parallel processing brains. Whether you like the notion of memes or not, you know that symbolic language somehow exists within our brains. The argument is that if you get enough of this symbolic material in these parallel-processing brains, you have sufficient symbolic material available to begin to manage or manipulate this material by means of the rules of a serial digital machine.

The counterargument would be to show (explain) how our parallel processors are performing these symbolic manipulations without the rules of a serial digital-computing machine. The *connectionists* are researching just this thesis (see Paul Churchland 1989; 1995). But it is by no means clear that their approach is better than Dennett's, for we do learn formal rules for thinking and manipulating symbols. We think in terms of algebra when we program our spreadsheets to become checkbooks. We are using symbol management rules when we recognize the fallacy of affirming the consequent, for example (All horses are animals. This is an animal. Therefore, it is a horse.), or (All As are Bs. This is a B. Therefore, it is an A.). The idea that a digital set of rules is being implemented by our parallel processing brains becomes a less extreme view when we acknowledge these points.

Try to recall the last time you worked with symbols. When we work on a mathematics problem, for example, our experience is working in a *serial* fashion. We move from one step to another. At the same time I am working on programming a spreadsheet, I know that my brain is managing all of the biological processes that are necessary for me to be conscious and to develop that spreadsheet. But—and this is the deal-closing point—I am not aware of working on any mathematics problem in parallel. All of our consciousness tells us that we are working in serial fashion. Of course, one could say that this is subjective, phenomenological data and thus not evidence for Dennett's theory. Nevertheless, the fact that we have never experienced parallel, symbolic problem solving, and that no one has ever advanced an example of conscious, parallel, symbolic problem solving is reason enough to take the theory seriously.

THE DISCUSSION THUS FAR

We have seen how brain growth is able to provide plasticity in the phenotype, which improves the probability of survival of the genome. Dawkins pointed out how

memes play a role in the natural selection of brain forms. Dennett's view of consciousness and the mind as a virtual machine was briefly reviewed. These discussions have created a context within which we can understand Dewey's argument about the ultimate value to which other values are subservient. To this all-important central problem, we now turn.

CONSIDER READING

1. See Leslie A. Hart's *Human Brain and Human Learning* (1983) for an account of how the triune theory of the brain is related to educational psychology.
2. The nature of consciousness was not included in the analyses of this book, but Daniel Dennett is well known for his views on the matter. In addition to his *Darwin's Dangerous Idea* (1995), which was mentioned in the list at the end of chapter 2, one should consider his *Consciousness Explained* (1991) and *Sweet Dreams* (2005).
3. LeDoux's *Synaptic Self: How Our Brains Become Who We Are* (New York: Viking, 2002) is a good introduction to neuroscience and many of the related philosophic topics.
4. I discuss how Dewey's idea of education as the reconstruction of experience could be seen from the view of Paul Churchland's connectionism in Popp, *Cognitive Science and Philosophy of Education* (1999).

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PART TWO

Morality Naturalized

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FIVE

Can Evolution Tell us What to Do?

Since in reality there is nothing to which growth is relative save more growth, there is nothing to which education is subordinate save more education.

—John Dewey (M9:56)



Dewey viewed the evolution of culture, language, consciousness, and intelligence as indicating one value that supersedes all other values. This point is the logical center of Dewey's pragmatism. As Dewey would say, all ends are not of equal worth, but there is one, growth, that has no end beyond itself. Let us examine what he means.

DOES NATURAL SELECTION HAVE FORESIGHT?

Nature has no end, no aim, no purpose. There is change only, not advance towards a goal.

—John Dewey (E1:213)

WHEN WE ASK IF evolution can tell us what to do, let us be clear that we are asking if the principles of evolution can give us guidance, as we *consciously* select and execute certain actions, that is, as we *conduct* our daily affairs. The

problem for ethics is how we decide what conduct to embrace and what to reject. Furthermore, a naturalized ethics would seek to establish its conclusions about conduct based on what we know about our species, and from the previous discussions, one can see that we do know quite a lot. The question is, what have we learned about our species that can serve to enlighten our conduct?

Natural selection, as Dawkins observes in *The Ancestor's Tale* (2004:276),

is always tinkering: here shrinking a bit, there expanding a bit, constantly adjusting, putting on and taking off, optimizing immediate reproductive success. Survival in the future centuries doesn't enter into the calculation, for the good reason that it isn't really a calculation at all. It all happens automatically, as some genes survive in the gene pool and others don't.

Is there any direction to nature's tinkering? Only if we look backward, like children looking out the rear window of their parents' car, seeing where they have been but not knowing where they are headed. We are seriously undermining our understanding of ourselves if we see all of biology that came before as having been there mainly to produce us. We are committing what Dewey calls "the fundamental fallacy of physical ethics," which means that we should "utterly deny that the physical world, as physical world, has any end; that nature, as nature, can give birth to an ideal" (E1:214, 213, respectively). We have to avoid the old trap of entertaining the idea that the ultimate end of anything, its real meaning, must be its perfection. It is not the point of natural selection to perfect us as human beings. Please do not allow this argument from design to creep in on you, because it will screen off Dewey's profound argument. If we *do* make that mistake, then it does seem reasonable to ask, where is nature taking us? But nature is not taking us anywhere. So, if you harbor the notion that evolution cares any more about us than any other of its creations, you are blocking your understanding of the species. This becomes clearer when one considers a small dinosaur named troodon.

Troodon (tro'-eh-don, wounding tooth) is frequently referred to as the smartest dinosaur because it possessed at least two unique characteristics. It is the only dinosaur that had both an opposing thumb and brain folds. As paleontologists always point out, if it had not been for the extinction of the dinosaurs, the existence of *Homo sapiens* on earth would be very doubtful. If the asteroid that led to the extinction of the dinosaurs had missed the earth, and dinosaurs had been allowed to continue to evolve, it is likely that the troodons would be studying their evolution in place of us studying our own. Would troodon have developed a brain with a limbic system? It is possible, but I doubt they would have named it the *mammalian* part of their brains.

We are here because of a certain amount of luck, not because nature had any bias in our favor. All this is to say that there was (is) no design built into the universe that made our existence any more probable than that of the troodonts. Given this chancy history, how would we ever decide what is the right thing to do? Some say that we must appeal to *supernatural* direction, because as we have seen, nature (the natural) has no directions, only consequences. They mistakenly believe that without an appeal to the supernatural, there can be no moral values, only more or less arbitrary preferences. Before you seize upon this thesis, note that while nature has not imposed a direction on our development, evolution has given us some tools with which to work. Nature may have no preference about whether we exist and develop or not, but nature does have consequences, and they are, fortunately for us, powerful ones. As Dawkins further points out,

Evolution, or its driving engine natural selection, has no foresight. In every generation within every species, the individuals best equipped to survive and reproduce contribute more than their fair share of genes to the next generation. The consequence, blind as it is, is the nearest approach to foresight that nature admits. (2004:276)

Nature is purely reactive, and never proactive. Yet sometimes it appears to be.

In her book, *Darwin in the Genome*, Caporale (2003) gives evidence that our DNA does respond to stress in ways that reflect past success. For example, the jumping genes (discussed in chapter 2) jump in ways that give the DNA a form whose odds for survival are significantly better than pure chance, that is, random changes or “blind” jumping. When the parent organism’s survival is threatened, the DNA within its offspring is changed slightly in ways that give these offspring a better chance for survival. She reports that when she presented this evidence to a conference, the question was raised as to whether she was suggesting our genomes possess some kind of intelligence (235, note 11). She notes that in 1996, Thaler and Messmer had “proposed and used” the term *genetic intelligence* in their paper, “Genetic Intelligence, Evolution of” (Myers, ed. 1996:407–14). Does this mean that evolution does have a kind of foresight after all?

The fact that our DNA is being found to be adaptive should be no more of a surprise than the fact that larger fangs and faster legs tend to outperform competitors who are slower and less well armed. Caporale holds that what has been missing from traditional evolutionary theory is the fact “that genomes that tend to generate the most adaptive types of variation will tend to have more surviving progeny for generation after generation” (2002:192). Of course, some genomes are more adaptive than others, and the extension of this notion to the conclusion that some genomes modify themselves in ways that are more adaptive than others seems possible. Caporale continues:

Thus, the abundance of organisms with a tendency to more strategic genetic variations should increase in the population, making the further evolution of new capacities more efficient. Because genomes do not inhabit a completely random world, generations that survive selection should evolve into genomes that are increasingly favored by repeated cycles of selection. (2002:192)

“Strategic” suggests that she is going beyond Dawkins, when he says, “The consequence, blind as it is, is the nearest approach to foresight that nature admits” (ibid.). Dawkins argued (1982) that the pressure of natural selection is on the genome and not the individual organism. Caporale is showing that the evidence indicates that the genome adapts to its nonrandom environment in ways that go well beyond random mutations that originate from copying errors. Moreover, this research answers those who argue that random mutation is too slow a process to explain evolution by showing that the genome is capable of making nonrandom reconstructions of its form.

THE PROBLEM OF THE NORMATIVE

Deciding to adopt a normative point of view is nothing else but deciding to be as rational as possible about our value judgments and prescriptions.

—Paul Taylor, *Normative Discourse* (1961:122)

After the large primate brain developed, early humans began to develop language, which likely began with grunts and hand movements that sexual selection refined into more and more precise communication. Such language facility requires consciousness, in the sense of being awake or not being “knocked out,” but it does not necessarily require the language user to be conscious of using a new sound to communicate this or that object or action. We know that sometime in the past, humans did become conscious of their language use, which is to say that they could think about their language use, and, as Dewey would put it, their thinking became conscious of itself. When they began to think about their thinking, somewhere along the way they began to think about goals or ends, to hold ends in view, and to associate ends with means. In other words, the early humans developed foresight, and along with this foresight came, to use Christine Korsgaard’s expression, the problem of the normative.

A lower animal’s attention is focused on the world. Its perceptions are its beliefs and its desires are its will. It is engaged in conscious activities, but it is not conscious *of* them. That is, they are not the objects of its attention. But we humans turn our attention on our perceptions and desires themselves,

onto our own mental activities, and we are conscious *of* them. That is why we can think *about* them. . . . And this sets us a problem no other animal has. It is the problem of the normative. For our capacity to focus our attention onto our own mental activities is also a capacity to distance ourselves from them, and to call them into question. . . . Skepticism about the good and the right is not skepticism about the existence of intrinsically normative entities. It is the view that the problems that reflection sets for us are insolvable, that the questions to which it gives rise have no answers.” (1996:92–94; emphasis in original)

Like it or not, we are stuck with the problem of the normative—of deciding what is right and wrong. Even a skeptic who walks away from the problem, claiming that there is no nonarbitrary way of answering such questions, nevertheless harbors a doubt in that such skeptics have not given a solid argument that the problem is insolvable. They know that they may be wrong. Can we show that they are? This is the fundamental problem of ethics. Since nature has by chance given us the power to formulate the problem of the normative, we wonder if along with this power to formulate the problem comes the ability to solve it, and we expect that the solution will involve attention to nature and nature’s processes, since it is by means of these processes that our minds evolved.

Dawkins raised the question: “Is evolution progressive?” (2004:597) He thinks that it is, in the weak sense of “progressive,” where what is meant is that evolution will continue “as the predictable continuation into the future of trends from the past.” When we add the mind to the mixture, we see an acceleration in evolution. The time between the Wright brothers’ airplane ride at Kitty Hawk and Neil Armstrong setting foot on the moon was a mere 66 years—less than a typical lifetime. One might say that this time was so short because of the emotion that followed the assassination of President Kennedy. (He had said that we should go to the moon in “this decade,” which meant in the 1960s.) There is no reason not to be as emotional about defeating the consequences of HIV, Alzheimer’s disease, Huntington’s disease, or fragile X. One could add to the list: poverty, school buildings not fit for use, drug treatment programs, and so forth. The list seems endless, but that is no reason not to attack these deficiencies when and where we can. Evolution may be progressive in the weak sense, but with the emergence of the mind, it could be progressive in a much stronger sense. Even if we agree that with the mind added to the evolutionary mix, a powerful new dimension is at hand, how do we approach the problem of the normative?

Most of the ethics literature is focused on the individual and not the species, but evolution is about species more than it is about individuals. Normative discourse that is focused on the individual contains many “I” questions, but normative discourse about species would generate “we” questions.

Answering normative questions is not the sort of thing that species do, but we as individuals can formulate and answer normative questions about our species. Our species can ask normative questions in the sense that if a significant number of us ask this question, then in a sense the species is asking the question. As Korsgaard noted, we are the only creatures who can ask such questions about their own species.

Asking normative questions in the context of evolution will readily focus the discussion on what has come to be referred to as “social Darwinism,” which superficially embraces the “law of the jungle” as a moral principle. The basic notion is that the same natural selection that was in force before there were minds and societies should be brought into current minds and societies as the best or only way that societies can evolve properly. Social Darwinism, put bluntly, views “survival of the fittest” as a basic moral principle (see Hofstadter’s *Social Darwinism in American Thought* [1944]).

Let us be clear that the social Darwinists are not saying that the evolution of our minds makes no difference in evolution, because it obviously does. If we embrace the law or rule of survival of the fittest, that is, what is valuable in life goes to those who are most able to take it, we are consciously choosing to live by this rule. In the world before *Homo sapiens* evolved, natural selection was in force, and not because of any conscious adherence to it by living things. The social Darwinists are saying that we should continue with this same principle that was so effective at evolving the various species, because it is equally effective at evolving the better societies. Since societies can exist in many different forms, saying that the rule survival of the fittest will evolve better societies does not tell us what a better society is. But in practice, at best, it becomes predatory capitalism, and at worst, gang warfare. As one knows, there are many economic as well as ethical objections to this view.

Note that we cannot practice natural selection, because in attempting to do so, we would be engaging in a form of methodological selection, since we would be conscious of what we are doing as we would have chosen it, that is, be engaged in consciously selected conduct. If our economic life should be modeled on the principle of survival of the fittest, this principle is a principle of conduct and not natural selection, because no animal, until the ones with the minds appeared on the scene, ever consciously chose natural selection as a rule to live by, though, of course, it is in fact the rule by which they must live. The point is that social Darwinism is not an acceptable solution to the problem of the normative.

So how should we conduct ourselves, now that we have the power, like it or not, to direct the course of evolution? If we continue to act in ignorance of what we know about the evolution of life on earth, then we are being poor stewards of our home in the universe. In too many instances, we act as if we do not know the processes by which we got here, so to speak. Greed or avarice explains our conduct, not the conscious decisions of how to behave in light of what is known about how life on earth exists and continues to modify its present forms.

DEWEY'S SOLUTION

In the distant future I see open fields for far more important researches.

—Charles Darwin, *The Origin of Species* (1859:458)

John Dewey solved what we have been referring to as the problem of the normative for our species ninety years ago, but because Darwin and natural selection were not taken that seriously by most of the educated public, his answer was never understood, even though, ironically, it was stated over and over again by educators. “Since in reality there is nothing to which growth is relative save more growth, there is nothing to which education is subordinate save more education” (M9:56). Dewey’s use of “education” here refers to personal development as opposed to being schooled, as they say. His well-known definition of the term *education* is “that reconstruction or reorganization of experience, which adds to the meaning of experience and increases the ability to control the course of subsequent experience” (M9:82).

Through the middle part of the twentieth century, professional educators quoted Dewey and his writings, especially his reference to education as growth and his definition of ‘education,’ because Dewey had authority as a philosopher who attended to education, and had outlined an explicit description of the goals of teaching. Since Dewey does not frequently point out to his readers that he sees his thinking as post-Darwinian, the evolutionary significance of his writings being quoted is often not fully understood. Think in terms of organisms struggling to survive, that is, under the pressure of natural selection. Moreover, imagine that the large human brain is yet to evolve. By what standard should we judge the growth of the species of these organisms? By what standard does nature judge this growth? The only standard in existence for the growth of these organisms, whether in numbers or genomic modifications, is the capacity for more growth. Natural selection weeds out individual organisms and whole species that cannot maintain that capacity.

During some later epoch in the biological history of *Homo sapiens*, our ancestors’ brains began to accumulate memes, which led to their possession of minds (Dennett, 1991; 1995; 2003). Neither Dennett nor Dewey views the emergence of mind as constituting a *discontinuity* with our ancestral primate forms. The point to be emphasized is that Dewey is *not* using natural selection as a metaphor for his account of intellectual growth. Natural selection selects those life forms whose genomes reconstruct themselves so that they maintain the potential for continued growth. Thanks to Darwin, our minds came to understand natural selection, which led us to see that our minds were an adaptation that met the demands of natural selection. The mind is very likely the reason we are here at all. Given its value to our existence, it takes no great powers of inference to see that we should protect it—and, of course, the

biological brain that supports it. But how do we protect it? We must understand the biology that makes it possible, but we must also maintain its capacity for continued growth. Possessing a mind does not guarantee that we will continue to survive in the struggle for existence, which led Dewey to devote a lifetime to the study of how we should think and act so as to maintain the capacity for yet further growth of mind. Just because we understand natural selection, we are not thereby excused from the demands of the struggle for existence.

Without some understanding of the details of evolution, one cannot adequately understand Dewey's argument that the only standard for judging growth is the capacity for more growth and how this same standard applies to the continued growth of minds, that is, reflective intelligence. His definition of 'education' obviously does refer to the growth of mind: The "reconstruction of experience" refers not to the gaining of new experiences, but to the way that we *manage* new experiences. Such reconstructions must both add *meaning* and *autonomy* to our experiencing. He uses 'experience' in this context to show the continuity of the growth of our knowledge with the growth of our bodies.

In pre-Darwinian thought, the various species existed as distinct forms, as did the distinction between our physical experience (pain, etc.) and our mental experience (private thoughts and images). Dewey's whole approach to philosophy is to put post-Darwinian ideas to work in philosophic thought. The pre-Darwinian mind-body distinction embraced by many philosophers (even some born after the publication of *Origin*) and the theory of natural law were being rejected by Dewey. The only "natural law" is natural selection, the enforcer of the "right" kinds of growth. The pre-Darwinian notion that humans are born with certain inalienable rights is not a natural law but a human attempt at the formation of an ethical principle (as we will see in chapter 7).

The problem every species faces is not to modify its genomes in ways that decrease its probability of survival in the struggle for existence. The self-reconstructing genomes described by Caporale (2002; 2003) increase their chances of survival because they have by chance put together a winning combination of modifications, which are then possessed by progeny. Dewey, obviously, could not have built his conception of personal development as the reconstruction of experience on the notion of genomic self-modification, because this research did not exist during his lifetime. But he did grasp, as is being argued, Darwin's basic idea that all life forms are under survival pressure, and the way that they survive is to be constantly modifying themselves so as to keep up with the competition—what both Dawkins and Dennett refer to as "an arms race." Darwin shows that for species to continue to exist, they must make positive changes in themselves, a principle that Dewey shows also refers to the growth of minds. Thus, his use of the term *growth* is not value neutral since it is a rejection of the kinds of growth that are detrimental to an organism, for example, cancer or species-destructive ideologies. Dewey is

using 'growth' in the sense of a value to be embraced as a way of staying even or getting ahead in the struggle for existence. One can now see the beginnings of a naturalized morality.

Evolution shows us that the phenomenon of living things is only adequately explained in terms of the continuity of growth, which is the central characteristic of the theory. Dewey grasped this feature of all living things and saw that any adequate, forward-going analysis of human cognition would have to respect the principle of continuity, which means that mind, consciousness, and knowledge must be described in the same language of constant continuous change required to express evolutionary theory. Thus, a hard line between mind and body, or the mental and the physical, is pre-Darwinian. The profoundness of Dewey's understanding of the consequences of Darwin for philosophy can be seen in the current literature in cognitive science, which has subsumed the theory of mind, and denies such a hard distinction between mind and body in favor of talk about the mind-brain or of talk about the mind being something the brain does.

DEMOCRACY AS MEANS

A humane and polished people, who have more sensibility to the passions of others, can more readily enter into an animated and passionate behavior, and can more easily pardon some little excess.

—Adam Smith, *The Theory of Moral Sentiments* (1759:300)

At some point in the deep past humans or humanoids, along with several other species, learned to manipulate or configure their environments in ways that increased the probability of survival. As Caporale says, the genome lives in a nonrandom world and can make its adjustments accordingly. This non-random world also makes it possible for creatures to discover ways of doing things that hold up over time. Methods of environmental rearrangements could be invented, improved, and passed on to the next generation. An obvious example is the shift about 10,000 years ago from hunting and gathering to farming. But such environmental redesigns are not limited to the physical world.

When John Locke rejected the view of society advanced by Thomas Hobbes, he was, in a sense, advocating the rearrangement of the social environment, which may be thought of as a set of rules for social commerce and interaction. Long before Locke or Hobbes was born, humans were devising rules for social interaction. One can imagine, for example, that stealing was looked down upon in the earliest times of human existence and even before that by the evolutionarily earlier species. To have a community, society, or culture is to have a set of implicit and explicit rules that are understood to some

degree by all and that are taught to the young as initiation into the social group. What we call “democracy” is a highly evolved set of such implicit and explicit rules.

It is not uncommon to find analysts or commentators suggesting that above all, Dewey was a philosopher of democracy. His arguments about the nature of democracy seem to these writers to be the prominent feature of his thought. I suggest that this view of Dewey’s approach to philosophy misses his real achievement, namely, that the very categories for thought are themselves reconstructable in light of our experience with them. These errors occur because of a lack of attention to the Darwinian background of Dewey’s thinking. To take a recent example, Menand, in his book *The Metaphysical Club* (2001), observes that after the Cold War, pragmatism began to receive renewed attention because its “skepticism about the finality of any particular set of beliefs” is once again of great interest, “[a]nd so has the political theory this skepticism helps underwrite: the theory that *democracy is the value that validates all other values*. Democratic participation isn’t the means to an end, in this way of thinking; *it is the end*” (441–42; emphasis added). With respect to Dewey, at least, there are two misunderstandings here. There are other examples that could be cited, but this statement makes a clear claim that democracy is the cornerstone of pragmatism.

As noted, during the middle third of the 20th century, educators were quoting Dewey’s statement that “education has no end beyond itself” (M9:48). In other words, the only end of education is more education. This was Dewey’s way of identifying *the highest value in the scheme of human values*. Nowhere in Dewey’s voluminous writings does he identify any other means or end as having no end beyond itself. Dewey never says that democracy is the value that stands above (or validates) all other values, that democracy is the end cherished over all other ends, that the end of democracy is more democracy, or that democracy has no end beyond itself. If one overlooks or discounts the role of evolutionary arguments in Dewey’s thinking, it does seem as though the entire focus of his thought is on democracy. Moreover, all of his talk about the importance of education seems to be taken by many readers of Dewey as an argument for seeing schools as means to democracy. At best, it is mentioned that democracy and education have an important relationship.

The second misperception, though less common, is that Dewey sees democracy as a political theory, which leads to the narrowest possible interpretation of the term. Dewey always writes about democracy as being more than a political theory or a form of government. Typical of his writings are comments such as democracy is a “form of social organization, *extending to all the areas and ways of living*” (L12:31; emphasis added). In *Democracy and Education* (M9:93) he says that “the devotion of democracy to education is a familiar fact.” He goes on to say that the “superficial explanation” of this fact is that democracy’s dependence on universal suffrage requires an educated cit-

izenry. "But," he continues, "there is a deeper explanation." Democracy is not just a form of government, but "it is *primarily* a mode of associated living, of conjoint communicated experience" (emphasis added). Democracy is a way of life, an attitude, or better still, a way of coming at life. It is living in ways that both use and develop intelligence. Democracy, for Dewey, is a cultural ethic that derives its normative force from his conception of growth, which is itself an evolutionary notion.

Late in his career, Dewey said that *Democracy and Education* (M9) is the best statement of his philosophic views. It is clear in that book that (1) democracy is much more than a political theory, and (2) it is *education that legitimates democracy*, not the other way around. But the most significant thing that Dewey says in *Democracy and Education* is that education has no end beyond itself. This is the valuational center of Dewey's philosophy. "Since in reality there is nothing to which growth is relative save more growth, there is nothing to which education is subordinated save more education." (56)

I think that it is clear that Dewey's analysis of democracy is an attempt to enucleate the social conditions that best open the way for intellectual growth, that is, that actively provide both the social conditions for, and the impetus to engage in the reconstruction of experience. The idea that growth is subordinated to nothing but more growth means that we should establish no social principles or rules that in any way inhibit or discourage the reconstructive process. The development of our intelligence is subordinated only to itself in the sense that growth as a standard requires that our reconstructions of experience should always be such as to make further growth possible. Thus, democracy is subordinated to growth, which means that the value of democracy is derivative.

INTELLIGENCE AS END

Of all the faculties of the human mind, it will, I presume, be admitted that *Reason* stands at the summit.

—Charles Darwin, *The Descent of Man* (1874:77)

Intelligence is a matter of effectively organizing one's ends and means. As new means become available or as one modifies one's ends, the reconstruction of one's beliefs about ends and means is frequently required. All such reorganizations or reconstructions are subjected to the standard of growth in that the test for such reorganizations is whether they further open the way for subsequent achievements of greater meaning and autonomy.

Dewey would say that it is more revealing to view the relationship between intelligence as a means and intelligence as an end as a continuous one, as opposed to seeing these as two separate categories. When scholars

such as Dewey or Dennett directly pursue the nature of intelligence, from the perspective of their inquiries, intelligence is an end. But, of course, it is their *use* of intelligence that makes their thinking productive. As we go about our daily business, we are not focused on intelligence as our goal or intelligence as means to other goals; nevertheless, even in the mundane activities of our daily lives, we learn certain things that either we did not know or that we can now do better. Dewey suggests that we lean forward into life, keeping our minds open to other things that we can learn from the events that play out before us.

There is a moral dimension in intellectual growth. When Dewey says that part of what he means by education is the increased ability to direct the course of subsequent experience, he is indicating that as we become more experienced, we become better able to effectively direct the course of our lives. This seems obvious. But note that the one who *directs* the course of one's experience has *responsibility* for the *consequences* of that directing. Becoming a better director of one's experience is always understood to mean becoming more autonomous, but it is not always emphasized that such autonomy entails moral competence with respect to one's own development as a person, to say nothing of the consequences for others. Dewey's definition of 'education' explains how reconstructing one's experience in ways that add meaning to one's life and that improves the effectiveness of one's conduct, is the only road to becoming an autonomous moral-agent. If personal development has no end beyond itself, then personal development is not justified solely as a *means* to other things. To say that education (personal development) has no end beyond itself is another way of saying that becoming an autonomous person has no end other than the achievement of even greater autonomy.

At some point in the distant past, there were no plants or animals. The rules of physics and chemistry provided the order for our prebiological world. Later, one-celled organisms evolved, followed by plants and then animals. As the animals became more and more complex, higher forms of intelligence evolved. Eventually this intelligence created culture and language, which gave consciousness the means to turn upon itself. As we became conscious of our thinking—as we began to think about our thinking—methods of obtaining food, clothing, and shelter became more and more complex and effective.

Dewey would argue that the very intelligence that created the theory of evolution and methods of manipulating DNA should be focused on the direction of evolution, by constructing and evaluating possible futures for ourselves, our nations, and the planet. Clearly, evolution has become our responsibility. As we focus our intelligence on the formulation and solution of important problems that arise in the lives of individuals, societies, and the planet, a basic thesis emerges.

If the intelligence that nature has set in motion has developed to the point where it is changing the course of the processes that controlled the planet prior to its existence, then our problem becomes one of managing this intelligence. In other words, our intelligence is no longer under the control of

nature. We have taken evolution into our own hands and along with it, the responsibility for the welfare of the planet.

The minds that gave us nuclear energy and weapons have also given us the specter of turning strontium 90, with its half-life of 98 years, loose in the world. Since strontium 90 is assimilated into the body as calcium, the extinction of humanity and the other vertebrates becomes a real possibility. The popular science fiction theme of recombinatory DNA studies going awry and releasing organisms never before seen on earth, but who would fare well under natural selection, is not an impossibility. Humans and other species face the continuing threat from microorganisms. New viruses suddenly appear with devastating consequences. As the planet gets more crowded, such diseases become more probable because the density not only makes diseases more easily communicable but also supports viruses that must pass from one organism to another to become virulent. Influenza, for example, must pass from ducks, to pigs, to people, since it takes a bit of each host with it when it leaves.

The proper response to these potentialities is not to curtail our thinking but to continue to develop it. As Dewey would say, it is not that *Homo sapiens* have become too intelligent; it is that they have not become intelligent enough. With each new development there has always been the fear that this time science had gone too far. But as one looks around at the AIDS and SARS viruses, at the suffering caused by serious birth defects, and the diseases that rob older people of their retirement, it becomes clear that there is hardly too much science going on.

We can now see the argument that is fundamental to Dewey's pragmatism. The only means by which we can have a sense of grounding or justification for our valuational claims is to recognize what evolution has presented to us. The problems that we recognize as being valuational issues arose as a product of our emergent intelligence. The only way to deal with these problems in nonarbitrary ways is to value the use and enhancement of intelligence. This is what Dewey meant when he wrote that personal development (education) has no end beyond itself. The intellectual growth of every individual is the means to the formation and evaluation of all of the other means and ends problems that we face. *Intelligence is the ultimate end because it is the ultimate means.* This notion of intelligence being created by natural processes, and then coming under the control of humans, leads Dewey's pragmatism to instate it as the supreme value—that the use and further development of intelligence should never be sacrificed in favor of other ends or means. And, at most, it means that we should never become so occupied with the pursuit of other goals that we do not attend to the further enhancement of intelligence. So, we see that it is the value of intellectual growth, not democracy, that validates all other values. Evolution does not have foresight, but it has given foresight to us. Dewey's words take on

much more meaning and become much more urgent when we understand that evolution does not guarantee our existence, which Dewey is indicating is now our responsibility.

A Fictional Dialogue

STUDENT: "Professor Dewey, you seem to be saying that everything is relative."

DEWEY: "Yes, I am."

STUDENT: "You're saying that everything is relative to growth."

DEWEY: "That's right."

STUDENT: "But if *everything* is relative, then growth itself is relative."

DEWEY: "It is."

STUDENT: "To what is growth relative?"

DEWEY: "Itself."

MEANS-ENDS LOGIC

From what can "ought" be derived? The most compelling answer is this: ethics must be somehow based on an appreciation of human nature—on a sense of what a human being is or might be, and on what a human being might want to have or want to be.

—Daniel Dennett, *Darwin's Dangerous Idea* (1995:468)

Dewey constructs no evolutionary explanations of how our parallel processing brains are able to manipulate highly symbolic material, but he does recognize that the mind did emerge by way of natural selection and that the philosopher's task is to help improve our cognitive architecture. To advance the power of mindedness, Dewey wrote many analyses as to how we can improve our thinking. Of course, there are the volumes *How We Think* (L8) and *Logic: The Theory of Inquiry* (L12), as well as many other writings about the role of logic in inquiry and problem solving, but his *Theory of Valuation* (M13) presents us with a clear example of both (1) how he sees an evolutionary grounding for his means-ends logic, and (2) how this logic can help us make better judgments as we deal with everyday problems. *Theory of Valuation* does contain criticisms of other philosophic views, along with the identification of the mistakes made by typical thinkers of all stripes, but its value is in the fact that it offers us a more or less self-contained treatise on how to make better value judgments, because "all deliberate, all planned human conduct, personal and collective, seems to be influenced, if not controlled, by estimates of value or worth of ends to be attained. Good sense in practical affairs is generally identified with a sense of relative values" (M13:192).

If we again think of the mind as a virtual machine built of a set of rules for processing information, a good deal of the computing power of the mind is devoted to trying to use good sense in practical affairs. Dewey is trying to get us to edit or upgrade the rules we are using to manage our affairs. In other words, Dewey can be interpreted as showing us how to improve the rules that constitute our virtual-computing minds.

When we find ourselves in a situation where something is amiss, and we want to improve that situation, we have to analyze the situation and project an end-in-view, or a goal to be achieved. Such an end-in-view might be to add something to the situation, take something present away from the situation, or reorganize the elements that are present. The question of means then becomes the center of attention. If there were no restrictions whatsoever on our choice of means, then what means would we select to achieve this end? Of course, most of the time the set of means available to us is limited in one way or another. Being able to remedy any given situation requires ingenuity with regard to the description of an end-in-view, as well as the selection of means to implement the bringing about of the projected change.

When we frame any given inquiry, we must take some things for granted. There is no cognitive way that we can really doubt everything at once—the sort of blanket skepticism exuded by the cynic notwithstanding. There is always a word or two that one must believe the other person understands. We define the problem situation as best we can. We know there are other features of the situation that we might not have identified, and there are assumptions that we are making of which we are not aware, but we forge ahead, doing the best we can with our imperfect knowledge. Our characterization of the problem throws light on the part of reality with which we think we must deal. All the time we know that there are more relationships that go beyond the limits of our characterization of the problem. Imagine a fisherman examining his net at night with only a small flashlight. The circle of light is thrown onto the net and moved around looking for a damaged link in the net. One could follow vertical lines or horizontal lines or look at the areas where one believes there is most wear and tear. Our inquiry is much like the circle of light being focused on a set of relationships. If we change the problem of the inquiry, we will be examining a different set of relationships, all the while knowing that there is a kind of organic continuity between our focusing on the different inquiries.

We define the problems we face in terms of the present situation in which we find ourselves. Was Dewey then advocating a form of “situational ethics”? If we take “situational ethics” to mean that moral behavior is solely determined by the facts of the situation in which moral judges find themselves, the counterargument is that situational ethics ignores evolution, because each situation in which we find ourselves is not unique unto itself. One situation grows out of another. Both history and the future, as far as we

can know either, form elements of the “situation” that is the context of the moral judgment.

Dewey considers what is often referred to as an “ideal” as that which can only be an end. His main criticism of these ends is that such thinking leads us away from the important point that an end is also a means. Life goes on after we have modified or corrected the situation in which we found something wrong. When we realize our projected end (the end-in-view) we may turn to other matters, but the end we have brought about has consequences, which means that the end instated could be viewed as a means to its consequences. The failure to see that ends are means, as the situation moves forward, leads us to make corrections that seem all well and good for now, but later we may find that what we thought we had fixed is actually all the worse for our efforts. Dewey holds that the view “that ends have value independent of appraisal of means involved and independent of their own further causal efficacy” is a fallacy. For an end to have value, we must have the means to reach that end, and the consequences of the reaching of that end must be desirable. Holding up a goal that is unachievable is of questionable value. We sometimes hear that pursuing an unachievable goal is not all bad because it draws us forward in our skills and character. Dewey would say that this argument is given in place of going to the trouble to characterize the actual end-in-view that is wanted. Stating precise ends-in-view will better focus efforts and provide an improved method of measuring our progress toward our goal.

There will always be unanticipated consequences of every action we take, because as intelligent as we *Homo sapiens* have become, we cannot see everything that lies ahead of us, all of our inductive arguments and statistical analyses notwithstanding. Dewey’s point is that we should focus on the end as a means, with the intent of identifying, within the range of our knowledge or understanding, what consequences will result from the achievement of a given end. To paraphrase Wittgenstein, whereof we cannot know, thereof we should be alert for the unexpected.

Dewey’s idea of being logical in one’s thinking is, of course, to examine the problem situation by clarifying one’s goal or goals and then to go about selecting effective means. If it turns out that the establishment of a goal is the focus of the problem, then tentative or hypothetical goals are identified and judged in terms of their further consequences. But if the goals themselves are at issue, how in the world does one perform an instrumental evaluation of these goals? Overlaying all such valuational thought is an ultimate value—the continued growth in intelligence. The continued growth of intelligence, both ontogenetically and phylogenetically, is a valuing that is required for reasoned or “logical” decision making.

What some think of as the major weakness in this view is best characterized by Dewey himself.

The objection always brought against the view set forth is that, according to it, valuation activities and judgments are involved in a hopeless *regressus ad infinitum*. If, so it is said, there is no end which is not in turn a means, foresight has no place at which it can stop, and no end-in-view can be formed except by the most arbitrary of acts—an act so arbitrary that it mocks the claim of being a genuine valuational-proposition. (M13:231)

If everything is evaluated as a means to something else (thus the label “instrumentalism”), and this something else can only be evaluated as a means to some other something else, we get the hopeless *regressus ad infinitum* of which Dewey writes. Over the years, many have taken this to be a rather obvious weakness in Dewey’s thinking that he never directly addresses. Would not a student in Logic 101 see the incompleteness of Dewey’s approach to evaluation?

The difficulty with this objection is that it derives from a lack of appreciation of Dewey’s Darwinism. In one way or the other, all of the criticisms that have centered on this and related matters over Dewey’s career have missed or misunderstood the fundamental role that Darwin plays in Dewey’s thought. The response to the *regressus ad infinitum* objection is that it is pre-Darwinian, in that search as we may for some fixed point to which we can appeal to terminate the logical regress generated by any given application of instrumental logic, we will eventually have to admit that any such identification of a terminal of inquiry will be arbitrary. This amounts to a kind of linear-regress objection.

Neither is the infinite regress terminated by appeals to the context of inquiry. That is, in any inquiry, that which is doubted is characterized in terms of the undoubted. Any hypothesis that is tested is done so with an epistemic context of other hypotheses or assertions that are not doubted in this inquiry but that could become the doubted in another inquiry, which, in turn, will be structured by certain assertions assumed to be true within the limits of that inquiry. This is sometimes referred to as “contextual relativism,” but the regress of contexts is an obvious objection. Are our evaluations doomed to failure? So how does the Darwinian approach stop the regress?

When we take an evolutionary view, that is, engage in post-Darwinian thinking, we see that emergence and development of the mind or mindedness is the explanation of our survival and current form of existence. This is the elephant in the living room of logical thinking. We do not have to generate a terminus for the suggested logical regress that is said to be built into instrumentalism, because there is no longer a mystery as to what constitutes the actual terminus. When we discovered ourselves as creatures with a reflective consciousness, we found ourselves already in the middle of Dawkins’ and Dennett’s arms race. We soon thereafter discovered that our reflective consciousness gave us, like it or not, the helm of evolution. We came to confront the problem of the normative for ourselves as individuals, but also for our species and all other species.

Mindedness is our lifeline to passing on our genomic code for making more minds in the future. There are no other species or supernatural entities who can come to our rescue if this passing on of the recipe for making minds is threatened with extinction. Our selfish genes want to retain their immortal status, and we, through their influence, want to keep mindedness on the face of the earth. We can do what we want as to building houses, growing food, playing games, and so forth just as long as we do not do things that threaten mindedness. We cannot ask normative questions if we do not exist. Evolution presents us with a *presumption of existence*, and until we get so warped that we revoke it, this presumption provides the ultimate contextual terminus for means-ends thought. Of course, when we decide to have roasted chicken over smoked salmon for dinner tonight, the decision may seem to be quite far from such profound logical matters as stopping infinite regresses, but as environmentalists will readily point out, that choice might have politico-biological implications for the future existence of minds. It used to be said that if you ask “Why?” three times in any cognitive discussion, you are into philosophic discourse. I will not venture an exact number of times it has to be asked, but at some point you will find that the discussion has flowed into evolutionary theory.

Of course, there are millions of mindless choices made every day, as well as many wrong-minded decisions, such as allowing thirty-five tons of mercury into the atmosphere each year by energy-producing corporations. The point of logic, however, is to develop the means of mindful decisions. No actual decision, or the inquiring discourse that underpins it, can be considered adequate or justified if it pays no attention to any possible consequences that might threaten our ability to remain minded or intelligent creatures. The real logical regression is to engage in activities and to make decisions that have consequences that limit or depreciate either our actual intelligence or our valuing of the role of intelligence in our activities.

Now we can see why it is that the commitment to intellectual growth is the highest value in Dewey’s scheme of valuings. The evolutionary perspective reveals that intellectual growth is the highest value because it is the ultimate arbiter of the value of consequences—consequences not just for individuals but also for the species. It is what we are and why we are! This was the point that Dewey seems to have grasped prior to the 20th century (see E5:399). So why did it take 21st-century thought to point this out? Part of the answer is that Dewey did not have readers who were knowledgeable of the last 30 years of research in biology, which may explain why he avoided mentioning evolution as a reference for much of what he was saying.

The terminus of the *regressus ad infinitum* of which Dewey writes is to be found in the meaning of our emergence and continued development as a species. Any end-in-view or actual end achieved will have consequences that, more likely than not, will have to be evaluated at some point. But as we gain experience with doing valuation and valuational inquiries, we know more

about the sort of things we have been evaluating. Our circle of light gets larger and larger, which means that our valuational conclusions get better and better as we include more history and better inferences about the future. As we interact with other evaluators, we learn more and more about the phenomena for which we must make moral judgments. Hovering above it all is the realization that reflective intelligence is what we are.

THE DISCUSSION THUS FAR

It should now be clear how evolutionary theory provides a scientifically created platform upon which one can build a theory of inquiry capable of answering our normative questions. Dewey was the first philosopher to see how Darwin's thesis created the basis for developing a naturalistic approach for dealing with traditional philosophic problems. The next question for Dewey or anyone else who grasps the point of evolution is to ask about the social conditions that make minds both more likely to survive and more likely to become even more intelligent. Dewey is well known for his analyses of democracy, but what is less well understood is the value that guided these analyses.

CONSIDER READING

1. John Dewey's account of both growth and democracy, and the relationship between the two, can be found in *Democracy and Education* (M9).
2. John Dewey's *Theory of Valuation* (L13) is a good introduction to his means-ends logic.
3. Philip G. Smith's *Philosophy of Education* (1965) presents Dewey's ideas within the context of teaching and educational theory.
4. In discussions of naturalized theory of meaning or value, one may ask if this approach was rejected by G. E. Moore's "naturalistic fallacy." Like many labels in philosophy, it is more familiar than understood. See Jonathan Harrison's "Ethical Naturalism," in *Encyclopedia of Philosophy*, or Popp, *Naturalizing Philosophy of Education: John Dewey in the Post-Analytic Period* (1998:93).

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SIX

Democracy and the Baldwin Effect

People respect candor if they are confident their leaders have a plan for moving forward. They do not like being talked down to or misled. It is the covenant of modern democracies: Tell it to us straight and we will do what it takes.

—Jon Meacham, *Franklin and Winston: An Intimate Portrait of an Epic Friendship* (2003:169)



As was pointed out in the preceding chapter, Dewey's primary value is the development of intelligence or intellectual growth. While Dewey has much to say about democracy, it is clear that he sees democracy as the optimal social context in which growth can occur. In this chapter, we will consider Dewey's criteria for judging the degree to which a culture or society is democratic and then explore how the evolutionary principle known as the Baldwin effect enters into a reciprocal relationship with Dewey's criteria.

INTELLIGENCE AS INHERENTLY SOCIAL

Biological instincts and appetites exist not for the sake of furnishing pleasure, but as activities needed to maintain life—life of the individual and the species.

—John Dewey (M5:247)

AS WE HAVE SEEN in the previous chapter, Dewey does establish a value—growth—that is the ultimate standard for all other valuing. In the period of philosophy concerned with language analysis, it was said that Dewey's meaning for 'growth' was obviously value loaded but that he never made his valuational criteria explicit. This criticism fails to grasp the evolutionary context from which Dewey was writing. If 'growth' is interpreted as simply quantitative, a matter of producing more and more of the same, such growth will eventually be terminated by natural selection. As Dawkins (2004) makes clear, for a species to continue to exist it must be constantly changing to meet new challenges. Growth, in the evolutionary sense, goes beyond making more of the same and is always a matter of changing in ways that make future growth more likely.

When Dewey says that growth has no end beyond itself, *growth becomes a social concept*. One might seek only to secure and enhance one's own life, but with a little reflection, it is obvious that everyone's growth (viewed selfishly or not) is dependent on some degree of cooperation among the members of the group. Natural selection had already removed those hominids that did not attend to the welfare of pregnant or nursing mothers. It made us social creatures, which means that somewhere in our genomic preparedness we have a social instinct. All members of the group lived better and with less stress and exhaustion when the work of survival became divided into weavers, coopers, and masons, to name only three of many craftspeople whose expertise increased the probability of survival for all.

On the contemporary scene, it is obvious that an elaborate diversity of abilities is required to keep the human species viable. The study of microbes, the production of vaccines, the knowledge of effective surgical methods, or the ability to build and place satellites in orbit and interpret the data produced to monitor global warming are beyond the mastery of any one person. To support our species, a complex set of sociopolitical relationships is required. Consider the sociopolitical complexity involved just to manage the discovery and utilization of scientific and technological knowledge.

Dewey's attention to Darwin's argument directed him to the value of growth and the point that intellectual growth must be social to be sustained. There has to be a set of rules within a group that serve the end of growth. Such rules existed in a nascent form because of natural selection's elimination of those groups who could not establish habits that increased their chances for survival, but Dewey saw that as reflective intelligence continued to grow, the habits, customs, and implicit or explicit regulatory rules had to become the subject of serious study. In his extensive analysis of the various personal and interpersonal problems that can occur within social interactions (his part of Dewey and Tufts, *Ethics*, 1932; L7), he seeks to establish the best ways that we can think about the proper conduct of all members of the group. Consider

the last two sentences in Dewey's part of *Ethics*: "Particular aspects of morals are transient; they are often, in their actual manifestations, defective and perverted. But *the framework of moral conceptions is as permanent as human life itself*" (L7:309; emphasis added).

When Dewey uses "permanent," we take note. Everything is to be reconstructed at some point, but not that which is as permanent as human life itself. The thesis being advanced here is that this expression refers to his idea presented in his 1916 statement that it is only growth that has no end beyond itself (M9:56). Growth is the end that is as permanent as human life itself. If life is no longer permanent, it will be because our genomes were no longer capable of effective reconstructions, which means that human growth is no longer possible.

Many writers over the years who have discussed the individual within society have presented accounts that were either explicitly individual versus society analyses or implicit explorations of the tensions between the two. What is often overlooked in these discussions is the role of intelligence. As was seen in chapter 3, an individual's "unlearned activities" are given meaning by means of habit formation. The self cannot develop apart from social interaction. It is individuals who possess the intelligence, but these individuals cannot become as intelligent in isolation as are those who are intensely engaged in social discourse about how individuals should relate to each other. One of Dewey's major achievements is his rejecting the idea that to understand the role of selves in society one must set them in opposition to each other, and replacing this frame of mind with an account of the relationship of the self in society that allows for the development of each individual in ways that benefit all members of society (see *Ethics*, L7: section 4).

THE MORAL CONTEXT OF GROWTH

There is nothing either good or bad, but thinking makes it so.

—Shakespeare, *Hamlet* (Act II, Scene ii)

In the previous chapter, it was pointed out that some pragmatists who see themselves in the Dewey tradition, or at least not in disagreement with his position, mistakenly take democracy to be the central concept in his philosophy. This error goes beyond simply misplacing democracy in Dewey's scheme of things, for it is his concept of democracy itself that is misunderstood. Most of his readers are clear that he is going beyond ideas about majority rule, the right to vote, and the protection of the minority and that he sees democracy not simply as a form of government but as an individual and social ethic. Nevertheless, the role of evolution in this analysis is too often overlooked.

Dewey's concept of 'growth' is built on the recognition that natural selection has been replaced by reflective conscious selection. We, not nature's trials and errors, are making the slight, and sometimes not so slight, changes in how we think. Such changes are positive when they modify our thinking in ways that make continued improvement in our thinking more likely. If the world was fixed and unchanging, as the pre-Darwinians thought, the more problems we solved, the fewer problems there would be. But, because of the Darwinian thesis, we know that there is no resting on our laurels. As a life form, superintelligent or not, there are always new demands placed upon us. Dewey is saying that we should deal with these new demands in ways that do not inhibit our ability to continue to face, creatively, additional new demands. When Dewey says that growth has no end beyond itself, he means that intellectual growth that is set in servitude to other ends will eventually lose its ability to adapt itself to new problems. In order to enhance the quality of growth, and to protect it from the attack of other things valued, some attention must be given to the social context in which growth will occur. As Dewey says, "Consistent as well as humane thought will be aware of the hateful irony of a philosophy which is indifferent to the conditions that determine the occurrence of reason while it asserts the ultimacy and universality of reason" (L1:99). Just as we have used our reflective consciousness to take the reins from natural selection, we can also identify ways of living together that go beyond trial and error development. "The ulterior problem of thought is to make thought prevail in experience, not just the results of thought by imposing them upon others, but the active process of thinking" (*ibid.*).

In the previous chapter, the conclusion was emphasized that when the legitimacy of Dewey's thesis about the absoluteness of the value of growth in terms of the priorities of ends is seen to flow from natural selection, we have the basis of a naturalized morality. While the purpose here is not to advance the complete account of Dewey's naturalized morality, we can take our understanding of that morality one further step. "The ultimate contradiction in the classic and genteel tradition is that while it made thought universal and necessary and the culminating good of nature, it was content to leave the distribution among men a thing of accident, dependent upon birth, economic, and civil status" (*ibid.*; *emphasis added*). It is not simply a matter of not preventing people from developing their powers of thought that is demanded by morality, but the positive and vigorous efforts to put nature's culminating good in the possession of all people. As we have seen in chapter 4, the kind of brain one has is to a high degree determined by the social and physical context into which one is born. But within those limits, every effort should be made to make every child as minded as possible, and in that way "those limits" are broadened from generation to generation. In morality, intellectual selection must replace natural selection but be just as demanding.

The future is emergent, which means that there will always be encounters that do not fit preexisting problem-solving formats. Consider the stock markets. Considerable effort has been invested in developing analytic software that can indicate what and when to buy and sell. Yet no computer program has been able to capture all that is involved, because the future is never just like the past. Dewey would be saying in this computer age that no decision-making program will ever be developed such that no further decision-making programming will be required, because there will always be something more to consider, not because it was there all along and was missed, but because as our decision processes move forward in time, there will always be new elements to identify and understand. This means that a society committed to growth will have to be structured in such a way that it can undergo changes that keep it viable in the face of ever-occurring new challenges. This also means that intellectual growth cannot be seen only as an instrument in the service of other higher ranking ends—ends that history shows us often become fixed and rigid.

Consider the inadequacies of fixed thought processes that we refer to as “ideologies.” Any approach to establishing a set of rules for decision making that is held to be fixed and complete in itself—that is, requires no changes or updates—is inadequate, not because it cannot be used in a variety of decision contexts, but because it must distort the descriptions of those contexts to make them congruent with the ideology’s problem-characterizing methods. In other words, the end being served is the rigid embracing of the decision process itself, which means that new ends emerging because of creative thinking must be modified or interpreted in such a way as to make the preordained decision process applicable to them. Facts are facts when they are consistent with the ideology, not when they are accompanied by independent evidence, for there is no such thing as (ideologically) independent evidence. This is what occurs when one turns to sacred or secular ideologies such as literal interpretations of the Bible, or Marxism, respectively. But the greatest disservice to those subjected to these ideological approaches is the intentional restriction of their ability to open the way for the projection of new and, at times, competing possibilities for the future, thereby denying people the excitement, the hopes, and the dreams that accompany such projections of betterment. When an ideological structure comes to characterize a society, it takes on a moral force that renders any alternative thinking about means or ends as false, dangerous, and immoral. One will argue that such a morality is an inadequate one and not what we mean by “morality.” At least, it is clear that ideologically structured societies are hostile places for those who hold Dewey’s conception of growth as having no end beyond itself. One can now see Dewey’s task. What is the social structure of a society that will enhance and protect intellectual growth?

Our heritage from the hominid’s struggle for survival to the evolution of our reflective consciousness leads us to place the highest value on our

mindedness, as it is the cause and sustenance of our existence. While other values, moral and prudential, have been created, mindedness itself is the center of Dewey's morality. The reason that growth creates a morality is that mindedness is possessed by individual persons whose social interactions have the ability, provided that they are of a given type, to enhance the mindedness of all participants. Thus, a significant aspect of how well we think is determined by how we associate with one another. Within any group, certain implicit social rules evolve that are passed around as memes.

All social relationships, implicit or explicit, potentially can support or detract from the growth and use of intelligence, and to the degree to which they are supportive of the further development of intellectual growth, they are moral relationships. If we are taught that alternative ways of thinking about ends or means are both false and dangerous (as ideologies must be taught if they are to survive), then thought that is fraught with the excitement of considerations of new social possibilities is frowned upon or punished. This leads to a lack of regard for one's fellow citizens because it is expected that everyone will conform to the demanded code of conduct. When one observes this conformity, it is deemed insignificant, but nonconformity is seen as a threat to society that cannot be tolerated. Thus, one's fellow citizens are either wrong and dangerous or invisible. Profound intellectual exchanges between citizens, or between citizens and their government, go extinct because they are always viewed as threatening to the social order. In such pre-Darwinian societies, because of self-protection against misunderstanding, social intercourse becomes persiflage.

As was argued in the preceding chapter, Dewey saw in Darwin's thesis the basis for developing a naturalized ethics. Human cooperation and preference for living together in societies may have begun because of natural selection, but with the emergence of mind, the possibility of a more complete set of social values could be enucleated. Societies based on conformity had no reason to pursue growth in the area of ethics because such inquiries served no purpose. The regard, or lack of it, that one has for others is an important ingredient in the determination of the character of any society. Germany under the Nazis suffered great social deterioration because of the state-created distrust among its own people, promoted by the idea that citizens should be wary of each other. When neighbors are seen as a potential threat to society, as opposed to being a potential asset for improving everyone's life, society requires no invading foreign army to destroy it. When a majority of citizens fail to realize that conditions are always changing, they lack a moral code that requires both the recognition of these changes and active participation in the management of these changes, and subsequently, the quality of their lives is diminished. While these people may not go extinct in the biological sense, their minds are not so fortunate.

It is with this recognition before him that Dewey is so concerned to provide analyses of societies and social relationships that support intellectual

growth and the requisite moral code that gives it value. Dewey's argument is that it is only a democratic society that can maximize the growth of its citizens, by creating a morality for guiding social interaction. In drawing this conclusion, Dewey is not simply appropriating the term *democracy* for his own ends. To the contrary, Dewey is considering the notions of democracy that one finds in the ancient philosophers of Greece, and more recently, for example, in the writings of our own penetrating and comprehensive thinker, Thomas Jefferson. The analysis of "democracy," as Dewey sees it, is not just the creation of a kind of Robert's Rules of Order for running governments, though, as noted, many see democracy in those terms. It is an inquiry into the nature of a moral code of conduct that can regulate social interaction in ways that not only leave open creative solutions to the inevitable change with which we must deal, but places a high value on such efforts. Perhaps our biological survival does not depend upon such creativity, but certainly the enhancement of our lives does. It is only the short-sighted (or nonsighted) secular and sacred fanatics who always reject such cognitive and moral vista-opening brainstorm, because they fear the loss of the familiar, no matter how restricted their lives are under such regimes. They gladly wear their handcuffs, all the while happy that their hands are restrained in front of them and not behind their backs.

We are only beginning to appreciate that Dewey is weaving together the implications of evolution for the further development of minds and morality with the human experience and thought about democracy, both ancient and early American, while at the same time identifying the elements of academic philosophy that stand in the way of this process. This is why so many of Dewey's readers see him as first and foremost engaging in the philosophic analysis of democracy. While they seem to recognize that he accepts Darwin's thesis, they miss the essential point that it is the evolutionary account of growth that Dewey is using to guide his analysis of democracy and many other social problems. Without this understanding of his goal, a full appreciation of Dewey's analyses is impossible.

DEWEY'S CRITERIA FOR DEMOCRACY

I know no safe depository of the ultimate powers of the society but the people themselves, and if we think them not enlightened enough to exercise that control with a wholesome discretion, the remedy is not to take control from them, but to inform their discretion.

—Thomas Jefferson (Letter to
William Charles Jarvis, September 28, 1820)

Dewey gives attention to the characteristics of societies whose sociopolitical organizations are such that they actively promote intellectual growth for all of

their members and create the social conditions that support the greater use of intelligence in the formation and solution of problems encountered. The proper sociopolitical organization of society is the means by which cultural capacity for intellectual growth is given unrestricted exercise. In *Democracy and Education*, Dewey sets out what he takes to be the criteria for the properly organized society. He states what he refers to as “the standard” for judging how democratic a society really is by asking two questions: (1) How numerous and varied are the interests which are consciously shared? (2) How full and free is the interplay with other forms of association? (M9:89). In the first standard, he asks us to consider what values or interests the people within a given group are aware that they hold in common. Dewey sees consciousness as the cognitive process of engaging in means-ends inquiry. If an interest is consciously shared by a sizable number of people, then as they put their minds to various problems, they are aware that their solutions and reconstructions have meaning that goes well beyond their personal well-being or even that of their extended family. Conscious sharing means thinking in terms that give consideration to the welfare of the peers of one’s village, state, nation, and planet. Dewey is asking about the extent to which the citizens of a community are pursuing their own narrow, selfish interests as opposed to being social minded.

Observe what this standard indicates for the role of media within a society. Through factual reporting, aesthetic entertainment, and editorializing, that which should be common within the consciousness of all citizens should be promulgated, not in the fashion of propagandizing, where what is consciously shared is established by the ideologues in control of the media, but by presenting alternative visions of common valuings and their consequences. It was with this point in mind that the First Amendment to the Constitution came to be.

In his formulation of the second standard, Dewey uses the expression “forms of association” as a general category to encompass all of the kinds of interactions in which people engage. These forms are not just that which can be captured in a sociogram. They may be such, but they are also aesthetic forms, just as much as Gothic or Colonial are aesthetic architectural forms. No society is completely homogeneous as to the forms of association in which its members engage, or the kind of value they place upon less familiar forms. People will tend to group themselves by similar interest, that is, by ends pursued in common, and the more diverse are the interests that create a group, the more stable and enduring the group will be. This second standard asks, to put it negatively, about the extent to which these various associating subgroups are cut off from other such groups. As the ties within a given group grow stronger there is a danger that this group will find that it has fewer and fewer interests that are consciously shared with other groups. What are the nature and limits of these forms of associations that make up the social intercourse of a given society? In a democratic society, members will recognize that while some interests such as occupational specialties will tend to separate members, other

interests such as clean drinking water and adequate health care are interests that when consciously shared by all tend to draw members into a more cohesive society. When these interests shared by all, these truly *common* interests, are made scarce so that there is competition within a society for the achievement or satisfaction of these interests, a society is fragmented to the degree of the ferocity of this competition.

People from markedly different cultures often find that they have much in common. People within a group will vary in the sense that some may find that they have more in common with another group than their own group, while others will find that their social group of origin is the only one in which they feel comfortable. This point could be stated in the language of statistics: for most people it is most likely that the between (among)-group differences will be greater than the within-group differences; but for some, the between (among)-group differences will be less than the within-group differences. Thinking in evolutionary terms, one would believe that groups that have many interests consciously shared will better deal with survival pressures than groups that share fewer interests.

Dewey's second question of how full and free are the interactions among the various forms of association can be asked in terms of the "viscosity factor," which refers to the ease of movement through the social medium in which individuals interact. In any society, a given person will more easily associate with some subsets of the society than others. For that person, the viscosity of the social relationships they encounter is lower in some areas than in others. Consciously shared interests can be seen as explaining the viscosity differences, in that the more consciously shared interests that all members of a society possess, the lower the social viscosity and the greater the potential of forming divergent types of social interactions. A low-viscosity group is a group with some shared interests, but as the number of interests held in common increases, so does the area of low viscosity within a society. As we will see, the Baldwin effect is maximized when social viscosity is low.

THE BALDWIN EFFECT

Human consciousness was made for sharing ideas.

—Daniel Dennett (2003a:259)

Of all affairs, communication is the most wonderful.

—John Dewey (L1:132)

There is another very important piece of evolutionary theory relevant to the discussion of democracy that we should consider—the Baldwin effect. Depew (2003:3) reports that it was George Gaylord Simpson who minted the name

Baldwin effect in recognition of the work of James Mark Baldwin, “an American child psychologist who claimed to have introduced the idea in articles appearing in a paper given in late 1895, and in publications in the *American Naturalist* and *Science* in 1896.” However, according to Depew, it could have been called the “Lloyd Morgan effect” for “the British animal ethologist Conway Lloyd Morgan, who addressed academic audiences in the United States during the winter of 1895–1896” because he “proposed the same idea in a paper delivered to a February 1896 session of the New York Academy of Science at which Baldwin also spoke” (2003:3–4).

Peter Godfrey-Smith (2003:54) reports that “Simpson’s paper was intended to deflate interest in the ‘effect.’ But his deflation included giving the effect a catchy name, which has stuck.” (Ridley’s chapter 16, in his book *Genome* [2002] presents a good introduction to the Baldwin effect. Weber and Depew have edited a collection of fifteen papers, *Evolution and Learning: The Baldwin Effect Reconsidered* [2003], that taken together provide a penetrating and comprehensive discussion of the Baldwin effect, including arguments by Baldwin skeptics and Baldwin boosters.)

The Baldwin effect occurs when a member of a group or species discovers or invents a new way of doing something that other members judge to be an improvement in how something is accomplished. In other words, this improvement is seen by some as a way of helping them in their struggle for existence. For example, one person or a family may construct a roof over the well, with the consequence being that the drinking and cooking water stays clean. As others observe the roof and the consequently cleaner water, they may take up the practice of covering their wells. Dennett used the term *good trick* to refer to all such innovations.

Emulation or imitation of a good trick might not be possible for all members of a group because the new good trick behavior might require a certain amount of phenotypic plasticity that all members cannot muster. Hypothetically, consider a group that prefers to eat a certain species of fish only found in areas where the water is turbulent. One member of the group invents a way of spear fishing that, while being particularly effective, requires exceptional eye-hand agility as well as strength. Those who possess this phenotypic plasticity are able to perform the good (fishing) trick, which leads them to have greater numbers of progeny than will those who cannot, because they are able to obtain better nutrition than those who could not master the good trick. In such a case, the Baldwin effect on the group is limited to only some members of the group.

A real-life example is provided by Diamond (1992:196). If a gazelle notices that a lion is stalking it, “It would be in the gazelle’s interest to give a signal that the lion would interpret to mean, ‘I am a superior fast gazelle! You’ll never succeed in catching me, so don’t waste your time and energy on trying.’” It turns out that the signal, known as “stotting,” is a certain way of

jumping in the air. The lioness sees this behavior and must make a judgment as to its authenticity. Natural selection will take out the fakers, that is, those that attempt to copy the behavior of others (instantiate the Baldwin effect), but because of a lack of phenotypic plasticity cannot perform the good trick. After a few generations a greater number of gazelles can send a signal they can back up, if challenged. Over time, a good trick such as stotting will narrow the variation, in this regard, in the genotype. In this case, we see that while the consequences of the Baldwin effect were limited in one generation, because of natural selection, it may be more prominent in future generations.

Some think that a further consequence of the good trick will be that the learned behavior of the good trick could come to be built into the genotype through mutation. In other words, we have a subset of a species or a culture, all of whom can perform the good trick; through the process of mutation and natural selection, those members will, over time, possess the good trick, perhaps as an instinct. Dennett says that if the new good trick fits well in the environment and there are no other good tricks appearing, then it is likely that instincts will be improved. If it is a "more volatile environment" where there are other payoffs for developing the requirements of learning, then a general improvement of intelligence is more likely. But then he says,

This tidy picture is no doubt complicated in reality by dozens of other effects that might swamp this underlying consideration: perhaps a particular anatomical detail in some brains makes certain sorts of learning (or instinct) particularly expensive; perhaps there's an interaction with metabolism or growth rate or who knows what else. . . . [W]e see a host of instances in which what is fixed and instrumental in one species is variable but learnable in another. (Dennett in Weber and Depew, 2003:75)

The Baldwin effect says, to generalize, that thinkers or minds in a group will approach the functioning of the best mind or minds in the group, where the group itself determines "the best mind in the group." In this way the Baldwin effect constitutes another type of selection. In the struggle for existence, anyone who is known to have a better way of dealing with this struggle will be imitated by other strugglers. Note that the Baldwin effect will occur only when there is selection pressure on the group. The emulators of the effect do so because they see it as a way to assist them in their struggle for existence. This type of selection may occur at a rocket's pace when compared to the natural selection described by Darwin. Progeny cannot inherit the use of improved memes because it is not a genetic matter, but the better anyone can think or be minded, the more successful they will be in the struggle for existence. So the Baldwin effect is a focusing of the better minds or better cognitive functioning within logical or physical improvements. If the good trick is conceptually (or physically) complicated, then those who cannot stay close to

the level of mindedness (or physical performance) in the group may find the struggle for existence more difficult and thus produce fewer progeny. This plasticity of biological brains is, of course, a matter of the genome, which means that plasticity does undergo natural selection. The memes are not passed on by inheritance but are passed by learning. What can be inherited that helps one in the struggle for existence is brain plasticity—the capacity to put to use better and better virtual machines that are being demanded by the emerging cultural norm.

Some good tricks do not require physical plasticity but cognitive open-mindedness. For example, as I. F. Stone points out in his book, *The Trial of Socrates* (1989), the whole process of establishing a representative government was impossible until the discovery of what the Greeks called “*isologia*,” which refers to the principle that a senator could not be sued for what was said in the senate. Were this principle not in place, any senator could be tied up in law suits to the point where the representative body is rendered useless, or worse yet, placed in the service of the wealthy because their affluence could be used to silence the less well-off senators who might challenge the rules that favor the prosperous. We find this principle today in the legal rule that one cannot be sued for anything stated in the *Pleadings* of a legal complaint. According to Stone, *isologia* is one of the best good tricks ever. (Dennett’s [1995] vote goes to Darwin, but within philosophy, I would give it to Dewey.)

Finally, if the members of the group see themselves in competition with each other, they may try to prevent the Baldwin effect from taking place. If one person has discovered a good trick that gives the person’s family or subgroup the ability to obtain food at less cost, in calories or dollars, the discoverer may attempt to hide this good trick from others, to retain a definite survival or better life advantage. Today, where good tricks can be patented, they are kept under wraps in the process that leads up to the actual legalizing of it as a possession. Secrecy is frequently associated with the discovery of good tricks.

DEMOCRACY AND THE BALDWIN EFFECT

He is born into a system of social relationships just as he is born into a certain quality of air. As he grows in body by breathing the one, so he grows in mind by absorbing the other.

—James M. Baldwin (1906:69–70)

The Baldwin effect is the imitation by many members of a society of what is taken by them as a good idea or good trick, which explains the dissemination of some ideas within a culture. When people seek to imitate a better way of doing something, they advance the skill levels within a society. The more plas-

tic their cognitive phenotypes, the greater the ease with which they will be able to engage in the activities required of the new good idea. Of equal importance is attitude. Consider carefully the following statement of Dewey's.

A society based on custom will utilize individual variations only up to a limit of conformity with usage; uniformity is the chief ideal within each class. A progressive society *counts individual variations as precious* since it finds in them the means of its own growth. Hence a democratic society must, in consistency with its ideal [which is sustained growth], allow for intellectual freedom and the play of diverse gifts and interests in its educational measures. (M9:315; emphasis added)

Dewey makes it clear that healthy, vibrant societies are not socially homogeneous societies. Democracies thrive not on sameness but on diversity, because it is within that diversity that good tricks will emerge—either by direct discovery or by the placement of a familiar idea within a different context. The social good trick discovered by the ancients, enhanced by the founders, and raised to a comprehensive philosophy by Dewey, is the recognition that growth and discovery are maximized where there is great intellectual diversity willing to engage in social interaction with all members of society. As was mentioned above, intellectual growth is maximized when this social interaction observes certain moral principles that Dewey points out are derivative from Darwin's thesis. So, while the Baldwin effect is a kind of evolutionary selector that permits and rejects variations in human practices, if we import Dewey's argument about growth as a social value, we see that the Baldwin effect is clothed in a naturalistic morality. (Note that Dewey cites Baldwin several times in his writings, but never in terms of evolution—only as a social psychologist.)

The Baldwin effect in democracy does not mean that we appreciate and emulate a good trick when one appears. The Baldwin effect means that we should be about trying to discover and then establish the social conditions that make the emergence of good tricks occur with greater frequency. The expression *establish the social conditions* means developing an individual-social ethic, a morality, a way to live, or a way to manage life.

If such an individual-social ethic were at hand or had been formulated, how would it be expressed? One excellent characterization (from the view of Dewey's analysis) of these principles is stated by Philip G. Smith (1965:243).

- Respect for individuality and the conditions that promote the growth of human personality
- Confidence in human intelligence that is formed and informed though the process of free, autonomous inquiry
- The right and responsibility for appropriate participation in investigation and resolution of problems of shared concern.

These principles are not prescriptions for specific conduct, but it is obvious that they can give direction to our actions and provide norms by which we can evaluate how well we are interacting with others. Further, these principles describe the social attitudes and beliefs that will maximize the emergence of good tricks, and equally important, these attitudes and beliefs will maximize the dissemination and utilization of the good tricks when discovered.

Beyond the Baldwin effect, if everyone, or even a majority, would play by these rules, everyone would be more sustained and directed. Static cultures do allow for a few good tricks as long as they do not transcend the rigid rules of conformity. But Dewey counts individual differences *precious*, because they are the means to further growth or development. Diversity, in general terms, is valuable because, while some individual variations may come to a bad end, just as some mutations fail in the struggle for existence, other variations will open new pathways to be traveled by a significant portion of the culture. A culture that allows individuals sufficient freedom to explore the consequences of divergent thinking opens the way for new discoveries that might just further the benefits of all members of the culture. On Dewey's analysis, a democratic society is one that has more than a high tolerance for unconventional, non-conforming practices within the society, for he is advocating the establishment of a society that is actively engaged in the evaluation of these practices. To tolerate certain practices, while making no judgment about their worth beyond the principle that other people can do what they want is a minimal evaluation.

So, in Dewey's terms, to maximize the potential of the Baldwin effect, a society should "allow for intellectual freedom and the play of diverse gifts and interests." This relates well to Dewey's two standards for democracy, which if realized serve to lower the social viscosity within a group, culture, or society. Lower viscosity supports the Baldwin effect. Let us examine it in more detail. The more interests that are consciously shared by members of the society, (1) the better judges they will be of the value of new ideas (good tricks) that appear from time to time, and (2) the wider will be the participatory base of those making the judgment. The fuller and freer the interplay among forms of association will increase the number of members who know about the new idea, which, in turn, further broadens the basis of judgment. But equally important is the fact that because of the open interactions among subgroups, the more likely all members will be to see the value of more specialized ideas, even though they do not directly benefit from them. They will know from experience that what goes around will come around. The Baldwin effect merges both senses of "normative." In the statistical sense, a new idea is widely disseminated within a group when it is pursued by a majority, and it is normative in the sense of being a standard for conduct when it is judged to be the best or most appropriate way of doing something.

The greater the speed at which numerous ideas can move throughout a group, the better the selection judgments that underlie the Baldwin effect can

serve social improvement. In any society some things are in everyone's interest. In a democratic society, the citizens' consciousness of these universal interests is, at the very least, high. Subjecting these universal interests to the selection of the Baldwin effect is a source of general cultural improvement that enjoys broad social legitimacy but does not always involve referenda or elections. Dennett has pointed out that we learn many things from stories and proverbs. The joke about painting oneself into a corner keeps us from doing it, and serves as a metaphor for situations other than painting. We read these stories to children not just to relax them but also to arm them with memes that will serve them in their own decision making.

Now consider the following: Hedrick Smith, in his book, *The New Russians* (1990), identified the Russian proverb, "The tallest blade is the first cut by the scythe." Anyone who has heard the proverb and taken it seriously will make sure that they are not seen as the tallest blade in the collective or culture. Think of a child in school who has grasped the meaning contained therein. This proverb, combined with Marx's principle that "from those according to ability and to those according to need," would suggest that one should work up to their ability, but the idea of excelling is going to be rejected. The judgment of what one's ability is will be dampened by the proverb, to put it mildly. Recall Dewey's comment about counting "individual variations as precious" since we find in them the means of a society's growth. However, one who believes the proverb will be very careful about their individual variations (read "deviations"). One not only hides one's better idea but must also hide the effects of that idea, were it ever put into action, even (especially) for personal benefit. There is no allowance, let alone encouragement, for "intellectual freedom and the play of diverse gifts and interests."

Think what that proverb means for the Baldwin effect. Since the Baldwin effect is a kind of social selector, any group that subscribes to the belief behind the Russian proverb is denying itself the benefit of better ways of doing things. You can see how this is the direct contradiction of what Dewey is saying about diversity. Established methods will hardly ever be challenged, and the familiar will be the desirable. Intellectual growth has no place in such a social scheme because it becomes a threat to the conventional order. So carefully examine the social institutions in which you find yourself, or which you seek out, as to how they respond to alternative methods or procedures and what becomes of those who raise objections or raise criticisms of the established ways of doing things. In America, we believe (or we used to believe) in the truth of Lord Acton's (1834–1902) comment, "Power corrupts, and absolute power corrupts absolutely." Those who wield absolute power usually do not appreciate those who criticize their practices. If those with the power believe that their practices are the best that intelligence can produce, within the confines of the social reality in which these practices were devised, then they will welcome suggestions and criticism, for they

believe that such will improve the practices in question, thus actually enhancing their power position.

There seems to be an instinct for a degree of cooperation within people, which one would think derives from the natural selection of cooperating groups. But cooperation is not always expressed in ways that benefit all or even some members of a group. The Russians who said to Hedrick Smith that they pretend to work and the government pretends to pay them are cooperating, but with a destructive social order. It is destructive, because if there are situations where a good trick can get one killed, the number of good tricks will quickly close to zero—which, of course, is what the leadership desires. This is workable for a while, but we know that situations change, often rapidly. Holding tenaciously to the familiar is to sink into history, as the familiar becomes more and more irrelevant to the emerging conditions in which the society finds itself. When any government seeks to suppress alternatives and criticism, it is admitting to itself (and the world) that it is an illegitimate government.

MEMEOPATHY AS AN OBSTACLE TO GROWTH

If the phenotypic effect of a meme is a tune, the catchier it is the more likely it is to be copied. . . . If it is a political or religious idea, it *may* assist its own survival if one of its phenotypic effects is to make its bodies violently intolerant of new and unfamiliar ideas.

—Richard Dawkins, *The Extended Phenotype*
(1982:110; emphasis added)

The Baldwin effect is demonstrated when members of a group imitate a meme they regard as a good trick. But let us look at the phenomenon of meme rejection. Dennett cites memes, such as faith, that have the ability to drive out or inhibit other memes from taking hold in the same person. In Dennett's terms, there are "phenotypic expressions that tend to make their own replication more likely by disabling or pre-empting the environmental forces that would tend to extinguish them" (1995:349). To create a surviving ideology, one should not only develop a consistent set of beliefs but also make sure that these beliefs have the capacity to inoculate people against certain good tricks, thus curtailing the Baldwin effect.

I propose using the term *memeopathy*, which roughly parallels the term *allelopathy* from biology. The most widely known cases of allelopathy are black walnut trees that produce a chemical (5 hydroxy-1,4 naphthoquinone) that is so toxic that many plants cannot grow in the areas around them. 'Allelopathy' is derived from *pathos* (to suffer) and *allelon* (of each other). Sunflowers are another typical producer of such pathogens. Virtually nothing will grow at the

base of a sunflower seed bird feeder. Also, sunflowers in the house give off pollen that is toxic to many other house plants.

The memes that we have selected, or those that have invaded our brains without explicit selection, determine our self (Dennett, 2003). If many of these self-making memes are self-protecting memeopathic memes, which shut us off from other possibly helpful memes, we should evaluate them and actively seek out those that can serve as the antidote for those memeopathic memes. Of course, over the years, various checks and remedies have been discussed for memeopathic closed mindedness. For example, the first meme of criticism demands that before one criticizes a philosophical (or other theoretical) position, one must be able to characterize that position in such a way that those responsible spokespersons for that position can accept that characterization of their position. Dewey uses this meme very well in his critical arguments. Good philosophic work often helps those whose position is being criticized better understand their own position. Contrast that meme with the memeopathic meme that seeks ways to characterize the position to be criticized in ways that will make it seem simplistic, absurd, or obviously vulnerable to attack. Recall the old point made in Philosophy 101: if my ideas are true, then testing them will serve to help me better understand them, and if they are false, then testing them will help free me of them. Some memeopathic memes may take up residence within us without our awareness of their presence. But since we know that once a meme is detected and explicitly analyzed, it is possible to jettison it, or at least quarantine it in some situations, a person should be mindful of the presence of any association-preventing memes.

DEVELOPING AUTONOMOUS AGENTS

The compulsions of the law seem to have been provided for those only who require compulsions.

—Thomas Jefferson (Statement to
Albemarle County Commissioners, 1780)

We may grant that Darwin is right in saying that several species of animals have sympathy for their disadvantaged fellows, and we can say that some of these animals engage in behavior that we can correctly call “altruism.” We may also grant that we humans have built on these feelings to the extent that we developed an explicitly stated, and more or less comprehensive, moral code or morality. There may be wide adherence to the moral code by people who see themselves as responsible for their actions, whether complying or deviating from the code. They are willing to take responsibility for their transgressions. But having such a code and having compliance with it by most individuals does not require autonomous or self-directed individuals. Without autonomous

thinkers, the moral code becomes either a set of rules to be mindlessly followed or rules to be furtively avoided. In both cases the moral code is not embraced as a means to growth. Any moral code or morality cannot be considered justified if it is not viewed by those for which it was constructed as at once directed and informed by experience, which, in turn, requires citizens who are reflective, self-directed thinkers.

Dewey once commented, "Regarding freedom, the important thing to bear in mind is that it designates a mental attitude rather than external unconstraint of movements" (M9:314–15). We tend to think of freedom as the absence of restraint. When our distant ancestors suffered from hunger, disease, or fear of deadly attacks, they were clearly not free *from*. However, focusing only on what we are free *from* misses the most significant dimensions of the nature of freedom. Dewey's emphasis on freedom as attitude is given further support by Dennett's profound conception of freedom presented below.

Dennett entertains the question about a future in which the practice of medicine, and the achievements of the sciences that support it, is vastly more developed than it is today. Erwin Schrodinger's famous book, *What Is Life?* (1944), has stimulated many to inquire into life processes. Some think that pursuing this question spells nothing but more trouble for humanity and are afraid that as the medical sciences develop further, all transgressions will be readily explained by science, and all responsibility will be dismissed. They fear hearing the following: "Al Capone was a homicidal psychopath because he had major deficiencies in many of his neurotransmitters. He would have been a normal human being if he just didn't lack a few molecules in his synaptic gaps." They believe that this kind of thinking is one click away from, "So it was not really his fault."

Is medical research actually the search for the exculpation of sin? As neuroscience, psychology, and medicine become more developed, will we discover explanations for any and every transgression? Will we get to the point that bad behavior is not the agent's fault? Do poor parents or teachers count as reasons why it was not really our fault? In response to this escape-responsibility defense, Dennett replies with a flat "no."

People want to be held accountable. The benefits that accrue to one who is a citizen in good standing in a free society are so widely and deeply appreciated that there is always a potent presumption in favor of inclusion. Blame is the price we pay for credit, and we pay it gladly under most circumstances. We pay dearly, accepting punishment and public humiliation for a chance to get back in the game after we have been caught out in some transgression. (2003:292)

This statement further supports the idea that freedom is, in great degree, a matter of attitude.

In a time when responsibility is explained away with arguments that one's conduct is not really one's responsibility, there is a danger of diminishing both the value and the reality of freedom. As Dennett likes to say, if you make yourself really small, everything is outside of you. His solution to the problem of responsibility ducking (making yourself a victim) is to focus on the benefits of living in a free society, while at the same time facing the music for our errors. Instead of making ourselves really small, we should be making ourselves stand really tall. While it is sometimes difficult to draw the line between those who should and should not be held accountable for their mistakes, borderline cases should not become a generalized excuse appealed to by all citizens.

Consider Dewey's remarks on responsibility.

A human being is held accountable in order that he may learn; in order that he may learn not theoretically and academically but in such a way as to modify and—to some extent—remake his prior self. The question is whether he is capable of acting differently *next* time; the practical importance of effecting changes in human character is what makes responsibility important. . . . The point at which theories about responsibility go wrong is the attempt to base it upon a state of things which *precedes* holding a person liable, instead of upon what ensues in consequence of it. One is held responsible in order that he may *become* responsible, that is, responsive to the needs and claims of others, to the obligations implicit in his position. (L7:394; emphasis in original)

As Dewey pointed out above, freedom is more of an attitude than the absence of external restraint. The goal is to reconstruct or reorganize one's experience so that there is an increase in the meaning of one's experience along with one becoming more autonomous as a result of this experience. Dewey sees being held responsible as a corrective means to reorient the person toward personal growth. Dennett's claim that we want to be held accountable further clarifies how we should look at this attitude.

Why would anyone want to be held accountable? If we are held accountable, then we have to admit that errors and omissions are our fault. But this is the point. If we are to see ourselves as free, then we have to see ourselves as being solely responsible for what our actions produce. What about people who refuse to take responsibility for their actions? Most likely they feel as though they do not have self-control. They believe that they are highly likely to get right back into the frying pan and must protect themselves as much as possible from punishment, which suggests that they cannot develop the attitude of freedom, that is, beyond the idea of freedom from external constraint.

Dennett turns to the issue of whether the taking of responsibility is on the decline. That is, he sees a creeping exculpation based on the claim that science

is showing us that when we are bad it was not our fault. The devil did not make us do it, but certain social and medical deficiencies did! The matter of morality or moral agents is not explicitly developed.

And so the best strategy for holding the line against creeping exculpation is clear: Protect and enhance the value of the games one gets to play if one is a citizen in good standing. It is the erosion of these benefits, not the onward march of the human and biological sciences, that would threaten the social equilibrium. (2003:292)

Have we always been clear that as we try to duck responsibility for our errors we are contributing to the erosion of our freedom? I think not. In place of avoiding taking responsibility for our actions, we should be demanding all the freedom our society can provide. Avoiding responsibility is a matter of attempting to conceal an inadequacy or to avoid punishment. No one is perfect. The old classroom rule is, mistakes are bad only when they are repeated. However, as Dennett (1995) points out, scientists have to make their mistakes in the glare of public attention. While this places a degree of pressure on researchers to do good work, it helps others not make the same mistake; what is more important, it gets other researchers to help solve the problem discovered or correct mistakes. Everyone makes mistakes, some of which are quite tragic; nevertheless, the goal is not to make the same mistake twice and willingly face the music if we do. This strategy will not make you perfect, but it will keep your head up as you get back in the game.

How do we protect the games we get to play if we stay within the rules? Is Dennett saying that when it comes to freedom, we should use it so as not to lose it? Could it be that in taking freedom for granted—the United States is a democracy, therefore we must be free, right?—we are not at all clear on just what freedom is or how it is protected? One of the games we get to play is to be able to say what we want, within the limits of libel, slander, and *falsely* yelling “Fire!” in a crowded theater. Verbal and written expression is one of the most important games we get to play. Some of the time—much of the time—this will involve criticizing those in authority. When a person is being trampled by the government or private powerful interests, that person is allowed to scream about injustice. The old saying that if the freedom of one of us is diminished, everyone’s freedom is diminished sounds good, but it is far from true in practice. What the screaming of one individual about injustice does (or should do) is to get us all to think about—be conscious of—what interests are shared by us all.

PHILOSOPHY FOR A SMALL PLANET

[T]he world’s environmental problems *will* get resolved, in one way or another, in the lifetimes of the children and young adults

alive today. The only question is whether they will become resolved in pleasant ways of our own choice, or in unpleasant ways not of our choice, such as warfare, genocide, starvation, disease epidemics, and collapses of societies.

—Jared Diamond, *Collapse* (2005:498)

Dewey began his philosophic career with attention to what evolutionary theory meant for the development of better methods of philosophic analysis. Darwin's thesis provided for new and forward going criticisms of the arguments of great pre-Darwinian thinkers that came before him, such as David Hume (1711–1776) and Benedict de Spinoza (1632–1677) (E1:3–18). His quest originated upon the firm basis of scientific work, which meant that his methods would be based on an adequate conception of what humans are and why they came to be. But if one moves from these original papers to his writings in his *Later Works*, one sees movement from the legitimization of natural ethics and epistemology to the search for a *unified philosophic view of life on earth*.

Natural selection has no foresight for any given species let alone all species. But with the emergence of mind or intellectual selection, our species began to develop some ability to anticipate the consequences of individual actions and, later, of general policies. When we look at the consequences of energy use, possible food and potable water shortages, rewriting DNA codes to change food crops, or new life forms, the creation of terrorists with dirty bombs, and so forth (see Diamond 2005 for the complete list), the problem of the normative is writ large, as they say. It is clear that policy making can no longer be piecemeal within a nation let alone among the nations of the world. It is not an overstatement to say we may be on a course that can render the earth unfit for just about all of the life forms we have come to know.

Of course, saving the planet requires understanding of the conclusions of planetary science, but we also have to devise methods for determining what is best for the planet—as Dewey said, nature can never “give birth to an ideal” (E1:213). While philosophy may appear impotent to some in the face of the problem of the normative on this scale, Dewey's project was to identify a way of coming at these problems so that the possibility of growth remained viable. We know from evolution that there is an innate urge to survive, and we expect that the 21st century will provide us with the scientific knowledge of how to do so—and, darkly, with the technology for failing to do so. Ethics, not science, gives birth to ideals. In other words, we do not lack the will to survive, or the scientific knowledge to survive, but we do lack the ethics to survive. We lack the social ideals embedded in the conception of democracy elaborated above. Ideals are implemented by politics, but they are never implemented by the politics of greed, suppression, and the lack of concern for other *Homo sapiens*, let alone the other species whose fate rests in our morals.

Dewey's writings, in their entirety, establish a way of solving or resolving problems so that with each success, we become better and better at dealing with the obstacles to existence. There is no question that all nations face basic issues as to how to provide food and potable water for their citizens. Energy is required for life, but how do we find and use it without making it the enemy of life? Philosophy alone may not be able to save the planet, but it is clear, especially after reading Dewey's attempts to get people to see that if they can come to share (emotionally embrace) the right things, a great vista is opened for the expression and pursuit of their individual differences. It is not a matter of setting our individual differences against those of other people, or setting individual differences against that which is embraced by all; democracy is a matter of establishing an ethical "commons" that encourages diversity of expression and divergence of thought. Simply saying that "what we share is more important than our differences" is *dead wrong*. Placing a greater value on what is shared than on the expressions of individuality is ideology, and ideology is the enemy of growth. What we share, if we are democratic in Dewey's sense of the term, makes individual differences more important than what we now share, because it is these differences that will pave the way for the reconstruction of what we can more productively embrace together. The commons can grow only through the creative use of intelligence of individuals. Politicians who view the essence of democracy as a form of government, or even more simply—voting, depreciate and narrow, if not destroy, the valuational basis of individual differences. We require more attention to our moral commons, for without a sense of moral direction, and just ways of conflict resolution, the planet's ability to support our life form decreases markedly.

America was born in 1776, the year in which the "Great Seal" committee suggested the motto, *E pluribus unum*, out of many, one. It was a way to suggest that it was time for cultural variation, divergence, and distrust to be surrendered in favor of a national coming together in order to form a union more perfect than the world had ever before seen. Dewey's evolutionary basis for his ethical naturalism that grounded his articulation of a post-Darwinian conception of democracy provides a possible explanation of the social principles at work that made the melting pot effective.

The natural-ethical commons that support Dewey's conception of democracy-as-a-moral-form-of-living supports and encourages individual differences, because growth, both minded and nonminded is sustained by variation. Dewey's analysis of democracy as the moral core of all social intercourse makes plain the conditions under which diversity can flourish without destroying the potential for yet further diversity. Stated differently, Dewey has presented earth with the diagram for how all social interactions can create the international appreciation of each specific aesthetic form of cultural and ethnic association, while at the same time enhancing the quality of life for all such cultures and ethnicities

THE DISCUSSION THUS FAR

Dewey's two criteriological questions specify the two dimensions of the concept of democracy, which characterize the social environment that he sees as the most supportive of intellectual growth. This two-dimensional analysis is further enhanced and supported by the evolutionary principle that has come to be known as the Baldwin effect. Dewey's view of growth as the reconstruction of experience that leads to greater meaning and autonomy can be seen as consistent with, and enriched by, Dennett's analysis of individual responsibility. Dennett's thesis is that the avenue to personal improvement, provided that one is willing to accept responsibility, without excuse or evasion, is to endure the punishment for one's transgressions. The problems that face all peoples on earth require the acceptance of responsibility, but on a planetary scale.

CONSIDER READING

1. For an account of the evolution of freedom and responsibility see Daniel Dennett's *Freedom Evolves* (2003).
2. A good background for the Baldwin effect can be found in B. H. Weber and D. J. Depew eds., *Evolution and Learning: The Baldwin Effect Reconsidered* (2003).
3. Dewey's *Ethics* (written with Tufts) is found in the middle of L7. Read what Dewey says, while keeping in mind that he is studying how we should manage ourselves once we have become autonomous thinkers. This is a good example of the naturalistic approach to ethical inquiry.
4. In *Experience and Nature* (L1), chapter 3, "Nature, Ends, and Histories," Dewey presents a good discussion of how he views ends.
5. Jared Diamond's *Collapse* (2005) presents a planetary analysis of the issues that confront civilization.
6. Readers who want to anticipate the ethical problems that will appear when the genome is understood well enough to show us which proteins are associated with specific enhancements that people may desire should examine Mehlman's *Wondergenes: Genetic Enhancement and the Future of Society* (2003).

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SEVEN

Evolution and Liberalism

A culture which permits science to destroy traditional values but which distrusts its power to create new ones is a culture which is destroying itself.

—John Dewey (L13:172)



Dewey's construction of a post-Darwinian method of philosophic analysis led him to investigate the nature of democracy as the sociopolitical context that best supports intellectual growth. He argues that democracy should be seen as much more than simply a form of government; for him, it is a way of coming at life—a morality. Within this notion of democracy, Dewey addressed the more narrow political perspective, in an attempt to reconstruct how we think about liberalism. His efforts are of value to us today.

INTRODUCTION

This country will not be a permanently good place for any of us to live in unless we make it a reasonably good place for all of us to live in.

—Theodore Roosevelt (Chicago, June 17, 1913)

TO APPRECIATE HOW the theory of evolution leads Dewey to reconstruct the idea of liberalism requires that we review the nature of liberalism as it was

envisioned in the pre-Darwinian period, which is now referred to as “classical liberalism.” As we will see, this pre-Darwinian liberalism grounded itself in natural rights and natural law. If we ask for the philosophic justification for claims about the existence of natural rights, we find that while they have morally superior consequences to those of the rights of monarchs, they are pre-Darwinian, both in time and in the fixed character of their categories. They are, furthermore, inferior to Dewey’s post-Darwinian approach to democracy as a moral perspective on life and, in a narrower sense, government. Classical liberalism was an attempt, both philosophic and political, to free people from the domination of monarchy, but its pre-Darwinian thinking limited its justification to little more than mere assertion. Dewey’s new liberalism sought to give an evolutionary backing to the basic notion of liberalism.

Thomas West, in *Vindicating the Founders* (1997), criticizes Dewey’s reconstructed account of liberalism because he thinks that it undermines the classical liberalism of the Founders, whom he seeks to “vindicate.” He claims that Dewey’s distinction between new and old liberalism is at the heart of the problem. While labels often do as much harm as good, in this case it is clear what is at issue. But before we examine Dewey’s critique, as well as West’s objections to it, we should take the time to briefly review the ideas that form the structure of several different views of the proper relationship between individuals and their society. It turns out that the best known Founder, the most quoted president except for Lincoln, ironically, sides with Dewey over West. This chapter then considers Diggins’ (in *The Promise of Pragmatism*) criticism of Dewey that his evolution-based philosophy has not led the nation to a more harmonious adaptive state. Diggins is answered by means of the distinction between natural selection and intellectual selection. The latter has become the focus of meme-generating think tanks that seek to manipulate intellectual selection.

THREE VIEWS OF THE INDIVIDUAL-SOCIETY RELATIONSHIP

If a free society cannot help the many who are poor, then it cannot save the few who are rich.

—J. F. K. (Inaugural Address)

To a great extent, the way one views the individual-society relationship gives rise to different conceptions of democracy. There are three basic philosophic views of that relationship.

Society as a Threat to Individualism. The individual, including all natural rights, logically speaking, exists more or less complete, prior to society. The role of

society is to provide a medium of interaction or transaction for individuals to carry on their desired activities. The desirable society is one that places the fewest restrictions on both an individual's natural rights and the forms of association or interaction. By giving full play to the individual's natural talents and personal motivations, a type of natural selection produces both individual achievement and the leaders of society. Freedom is a matter of being free from social imposition. This view is known as "classical liberalism."

The Individual as Defined by Society. This view of the individual-society relationship holds that while there are individual differences attributable to genetic differences and environmental factors, it is society that determines the individual. It is society that selects its leaders, and once selected, they bear less credit for their position than does the superorganic nature of the society in which they hold this rank. Social change has an inherent direction, and individuals are advised not to swim upstream, as it were. Individualism achieves its most developed state when it grows in concordance with the direction of the society in which it exists. An individual will encounter fewer personal and developmental restrictions when he or she moves in concert with the society, instead of opposing it. In this way, society provides individual freedom. This view is usually classified as "super organic" and is exemplified in the writings of Marx and some German social theorists.

When viewed from the perspective of Darwinism, this superorganic conception of society is actually a form of secular creationism. That is, the ultimate explanation of how and why society does what it does vaults beyond human experience and appeals to entities or existences that can have no substantiation in evolutionary theory. There are no scientific principles to which it may appeal, save the generalizations constructed from an ideology. In other words, if we take the *explanandum* to be human intelligence, then the *explanans* must be scientifically defensible. The Darwinian explanations ride upon a convergence of the conclusions of numerous diverse sciences. The superorganic view is actually a supernatural view—"above" in the sense of beyond or outside of nature.

Dennett will say that the superorganic approach is actually an appeal to a "sky hook," which is a miraculous device that allows heavy loads to be held up with no support.

Society as Individual Maker. The third view of the individual-society relationship does not place society above or superior to the individual as does the superorganic view. Nor does it see the individual as complete in some natural sense prior to society, as does the classical liberal view. The role of society is to produce individualism. The presocial individual requires social interaction to develop into an individual. Individuality is an achievement, not an initial state. The desirable society is the one that promotes individualism. This will not be

achieved by a *laissez faire* society, because if the individual is given only the free play of their natural tendencies, and society provides no nurturing support or direction for growth, there will be no growth in personal and social competence. Freedom is not something that society allows, as both of the other two cases hold; rather, freedom is the product of having lived in a desirable society. This view is sometimes referred to as “progressive liberalism.”

One can now see Dewey’s predicament. The classical liberals see his theory as a form of the superorganic view because it denies that an individual has natural rights and that there is anything meaningful in the expression *natural law*. They hold that a person can and should develop apart from society or within a *laissez faire* society. The meme “welfare state” is summoned forth to suggest that Dewey sees society as taking care of its citizens the way parents care for their children. The claim is that slackers are treated the same as hard-working people, which is unfair. The superorganic view sees Dewey as a disguised classical liberal because he will not admit that there is a preordained direction for social development that exists independently of the individuals within the society. To use an expression of Dewey, progressivism “falls between the stools” in the minds of most people who talk about these matters. Somehow the notion of society producing individualism escapes them. However, the society or culture in which we find ourselves is, to a great extent, what other people are doing. Recall that we are born with various unlearned actions that take on meaning as these innate tendencies come forth from infants and children (and, at times, adults) within a social context. The values, desires, or preferences that others publicly reveal, lead us to become, through our own imitation, identification, and rejection of what we experience, a type of self. If growth is the highest value, then a good society is one in which what people are doing has positive consequences for intellectual growth.

CLASSICAL LIBERALISM

Corporations have been enthroned and an era of corruption in high places will follow, and the money power of the country will endeavor to prolong its reign by working upon the prejudices of the people until all wealth is aggregated in a few hands and the Republic is destroyed.

—Abraham Lincoln (Letter to Col.
William F. Elkins, November 21, 1864)

The story of classical liberalism commonly begins with a discussion of the Hobbesian idea of the social compact. According to Dennett, Hobbes realized that some account was required to show “how the state came to be created, and how it brought with it something altogether new on the face of the Earth:

morality" (1995:454). Note that the notion of a social compact is an idealization, in that there was no point in time when a group of people got together and said to each other, "Let's form a social compact!" but the story gives *legitimacy* to the idea of living within a state, including its prescribed and proscribed conduct, as opposed to each family or small group fending for itself. As Dennett emphasizes, a story was needed that both codified the various social structures that constitute a state and gave some idea of the genesis of government. Hobbes' argument is that primitive peoples, peoples who are not members of any well-defined society, possess individual sovereignty—a sovereignty given by God or nature, depending on your point of view. On Hobbes' account, these people came to see that it was in their interests to give up or surrender this sovereignty to a monarch as a ticket to entering society. A social compact is thus formed by transferring sovereignty from the individual to the monarch.

According to Hobbes, this is a rational decision, because there are greater benefits to individuals to be realized in life within society than there are in retaining their individual sovereignty. His selling point is the fact that societies can provide for the "protection and defense" of its members. By giving up their individual sovereignty, they have greater security as members of a larger group, which can develop a highly skilled army to provide an effective defense. As Darwin is always pointing out, within every species there is a certain amount of variation of significant individual characteristics; this could explain the specialization of work. If someone becomes a cooper or a blacksmith, higher quality tools and products are made available to all people; we might say that people were freed to do what they were good at because they were both allowed and encouraged (rewarded) to pursue their interests, which enhanced the quality of life within that society. Food, clothing, and shelter would be better provided than if they lived alone or in small groups. Because they could realize these *desiderata* through society's organization and rules of interaction, individual sovereignty was a cheap price to pay for these benefits.

John Locke, of course, rejects this abandonment of individual sovereignty and argues that while living in society does restrict one's freedom to some degree, some rights may not be taken from the individual, because some rights are "inalienable." If each individual retained some degree of sovereignty, then the proper role of social authority or government is to grant the existence of these rights and incorporate them within its laws and safeguards. Human history is, for Locke, a record of how governments have abused these individual rights. Since it is Dewey's criticism of this view that will come under fire, we should let Dewey characterize Locke; and since, as we will see in a later section, West draws his criticism from Dewey's book, *Liberalism and Social Action* (L11), I will limit Dewey's remarks to this book only, although *Individualism Old and New* (L5) is also relevant.

Locke sees liberalism as the view that "governments are instituted to protect the rights that belong to individuals prior to political organization of social

relations. . . . Since governments are instituted to protect the natural rights of individuals, they lose claim to obedience when they invade and destroy these rights" (L11:7). On Locke's view, the individual is defined "in terms of liberties of thought and action already possessed by him in some mysterious ready-made fashion, and which it was the sole business of the state to safeguard" (L11:7).

On the classical liberal view of freedom, what receives the emphasis is "freedom from," which means that classical liberalism does aim at protecting the games we get to play but has less to say about enhancing them. Even that may be a stretch because it may not be possible to protect something that has not been identified. Classical liberalism, in its focus on freedom *from*, denies itself any direction in freedom *to*. Individuals may actively pursue growth, but the laissez-faire society in which they exist provides only minimal support for enhancing intelligence, since it sees the individual as more or less complete, because the processes of growth do not involve society.

When we are free *from*, what are we free to do? The classical liberal answer is: whatever you want. (The neoconservative position is: do whatever you want within the bounds "we" set.) The old liberalism holds that it is no one's business to tell you what to do. Do what you want, even if it is mindless behavior. Such behavior has its place in life. Skipping stones across the water and building sand castles at the beach are valued activities. Their very departure from our cognitive struggles makes them so. But while these kinds of activities are part of the games we get to play, they are not the kinds of activities that *enhance* the range of games we get to play.

It was the old line of classical-liberal reasoning that Thoreau echoed in *Civil Disobedience*: "that government is best that governs least." Government should leave well enough alone, that is, be laissez-faire, because when governments govern, inalienable rights are threatened. Some refer to this view as "let do" individualism. President Herbert Hoover says in his book, *American Individualism* (1922), that every individual should have an equal opportunity to "stand up to the emery wheel of competition" (9–10). In this way both society and the individual benefit because the individual can take the "position in the community to which his intelligence, character, ability, and ambition entitle him" (9). This suggests that the environment has a role in providing for an individual's discovery of his or her natural talents, but the environment is far from a nurturing one, beyond that realization. One can see how the social Darwinist principle of survival of the fittest could easily be embraced by classical liberals: the emery wheel will grind down the unfit.

At the middle of the twentieth century, World War II had ended and American business moved from the captains-of-industry notion of leadership exemplified by J. P. Morgan and John Rockefeller, inter alio, to the corporate mentality described by Whyte in his famous book, *The Organization Man* (1956). Within the law, corporations are considered to be persons, and by this legal personification, corporations could retain continuity with the earlier cap-

tains-of-industry idea. The organization man believed that through total allegiance to his corporation he would receive occupational and financial security.

It might seem paradoxical that persons committed to an extremely individualistic philosophy could almost mindlessly place their lives in the hands of a large corporation. Is this not an anticlassical liberal mentality, in that welfare guarantees what is required for basic survival and minimal comfort? The welfare provided by the organization was, of course, conditional on maintaining minimally acceptable performance. As long as employees served well enough, they could expect to receive benefits. If they performed better than their peers, then they could expect to move up in the organization. Rugged individualism still existed but had been tamed somewhat to fit into the tall glass office buildings of the postwar period. However, the basic idea of individuality as existing apart from, and in many ways, in defiance of society still existed and was reinforced in movies and television. For example, in the late 1950s it was possible to watch five continuous hours of Western television shows on Saturday nights. The cowboy was the embodiment of the rugged individualist.

This view of individualism became even further refined in the next generation. The organization-man families were sufficiently affluent to afford college and other "self-discovery" activities. The affluence of their parents' generation made possible an "extended adolescence" in which their children "felt no need to choose irrevocably a vocation and embark upon it" (Leinberger and Tucker, 1991:131). After all, "an early commitment to a career could lead to what psychologists call premature foreclosure of identity" (131). Organized religion was also psychologized. "The injunction to have faith came to refer not so much to God as it did to one's own psychological attitude. In short, the ground of value, even in religion, became the self" (147).

Leinberger and Tucker further conclude that rock music played its role in the completion of the classical individual. While rock was born among blacks and poor Southern whites, perfected by Elvis Presley and Chuck Berry, and reintroduced by white British youths ten years later, it "retained its emphasis on pleasure and self gratification" and continued "to play its part, along with the family, the suburbs, and the church, in the formation of an entire generation for whom the expressive self would be the ultimate ground of value" (152).

Classical liberalism in America seems to have had three phases. It began with the rugged individualism of the American frontier, which was a nonparticipating individualism that looked down upon society as a threat to individuality. The captains of industry became the industrial form of the rugged individual. The presocial self was transformed into the organization man when corporate life required a loyalty to an enterprise larger than the individual. In its last stage, the classical liberal, presocial self focused on becoming an authentic self. Through the teachings of humanist psychologists such as Carl Rogers and Abraham Maslow, the sons and daughters of the organization men discovered themselves.

Dewey's response to these events is obvious. As science and technology have freed people from physical toil and at the same time given them more "free time," they have neither individually availed themselves of what the new methods of investigation offer them nor built these methods into their social relationships.

DEWEY'S NEW LIBERALISM

A conservative is a man with two perfectly good legs who, however, has never learned to walk forward.

—Franklin D. Roosevelt (Radio Speech, October 26, 1939)

Does Dewey think *laissez faire* liberalism has produced anything close to economic parity?

When it became evident that disparity, not equality, was the actual consequence of *laissez faire* liberalism, defenders of the latter developed a double system of justifying apologetics. Upon one front, they fell back upon the natural inequalities of individuals in psychological and moral make-up, asserting that inequality of fortune and economic status is the "natural" and justifiable consequence of the free play of these inherent differences. Herbert Spencer even erected this idea into a principle of cosmic justice, based upon the idea of the proportionate relation existing between cause and effect: "I fancy that today there are but few who are hardy enough to assert that the disparities of property and income bear any commensurate ratio to inequalities in the native constitution of individuals." (L11:29)

Dewey recognizes that it is the classical liberals who presented us with an "enduring value of the liberal creed:—intelligence" (L11:31). He continues:

Grateful recognition is due early liberals for their valiant battle in behalf of freedom of thought, conscience, expression, and communication. The civil liberties we possess, however precarious today, are in large measure the fruit of their efforts and those of the French liberals who engaged in the same battle. But their basic theory as to the nature of intelligence is such as to offer no sure foundation for the permanent victory of the cause they espoused. They resolved the mind into a complex of external associations among atomic elements, just as they resolved society itself into a similar compound of external associations among individuals, each of whom has his own independently fixed nature. (L11:31)

Locke's assertion of inalienable rights made room for the development of intelligence and for its role in configuring societies. But, as Dewey is saying,

its approach to liberty is deeply flawed. As the chapters comprising part 1 reveal, the classical liberal view of the mind and of the development of intelligence is not consistent with what we know about the conditions of brain growth, yet some will not release their tenacious grip.

The laissez faire argument is that the basic character, nature, motivations, abilities, moral code, and so on of an individual is established prior to, and independently of, their engagement in the employment activity. It thus follows that these prior individual differences will lead to differential consequences, as individuals engage in their activities of livelihood.

In the first years of the new millennium, we have witnessed enormous disparities develop between corporate executives and nonexecutive employees. Moreover, we have seen that these executives did not possess any natural intellectual advantage over those nonexecutives of their corporations. In fact, we have seen repeatedly that it is the executives who turn out to be the moral inferiors. There are those who, even in light of all this embarrassing executive chicanery, hold to the classical liberal view, a view that is markedly different from the one Dewey is advocating.

The problem of democracy becomes the problem of that form of social organization, *extending to all the areas and ways of living*, in which the powers of individuals shall not be merely released from mechanical external constraint but shall be fed, sustained and directed. (L11:25; emphasis added)

Note that this view of democracy differs from many characterizations of democracy as a form of government. To take a recent example, Somit and Peterson (1997:32–33) hold that democracy has the following two “basic characteristics: majority rule with universal suffrage, and the rule of law.” This seems to identify the minimal features necessary for any form of government to be called a democracy.

But such a characterization of democracy is much narrower than Dewey’s. Dewey is saying that democracy is a way of coming at life—“a way of living.” If democracy is simply majority rule, there is no way within the concept of democracy of judging the morality of the majority. In the history of the world, there have been majorities that have treated minorities quite poorly, to put it mildly. Political minorities often speak of the “tyranny of the majority” in an attempt to make a political gain, but there have been majorities that were tyrannical, in every way the term suggests, with regard to a minority’s well-being.

The difficulty with these legalistic mechanical characterizations of democracy is that they contain no normative principles, which as we have seen is a dimension to which Dewey gives considerable attention. Dewey’s concept of democracy is, at the very least, a set of norms that give direction to our social interactions and establish the means by which we can evaluate our own and others’ conduct in areas beyond voting and acting according to law.

Unlike the classical liberal, Dewey does not see individuals as complete autonomous agents prior to their interaction with society. One cannot say what qualities are present prior to social interaction, because it is through democratic social interaction that one discovers their individuality. Dewey is arguing that our individuality, the part that really counts, is a result of social interaction, not something given prior to that interaction. What we all can gain from social interaction depends on the quality of that social interaction. We know that persons can engage in social interactions solely for their personal benefit. Dewey wants everyone to pursue their own goals, but this does not mean that they cannot, through their conduct, become the means to others' development as autonomous agents. (We saw a specific example of Dewey's social organization "extending to all the areas and ways of living" in Philip G. Smith's three democratic principles stated in the preceding chapter.)

To test Dewey's view of democracy, consider the following case. I once watched a television program about one of America's aircraft carriers. The program ended with the narrator saying, "An aircraft carrier is not a democracy, but it is a tool of democracy." Of course one would not expect universal suffrage and majority rule on an aircraft carrier. Dewey's concept of democracy is far from the matter of voting and majority rule. One might say that there should be little, if any, democracy aboard an aircraft carrier. But consider the following questions: Could there be too much respect for individuality and for the conditions that promote the growth of human personality? Could there be too much confidence in human intelligence that is both formed and informed through the process of free, autonomous inquiry? Could there be too many rights and responsibilities for appropriate participation in investigation and resolution of problems of shared concern? One might even go so far as to say that these are conditions possessed by the best armies. I realize that we could debate the appropriateness of certain key words in the above questions, but I think they do help make it clear that Dewey's concept of democracy as a socio-cultural ethic goes well beyond narrow political interpretations.

WHY NONDEMOCRATIC SCHOOLS ARE MISEDUCATIVE

In approaching the problem of learning, our clue must come from the idea that the mind is such a process of "progressively shaping up the environment."

—Boyd H. Bode, *How We learn* (1940:233)

The reason that Dewey spent so much of his writing time in the analysis of schools and teaching often escapes many philosophers. They recognize that while his arguments are divergent from the philosophic tradition of English-speaking countries, these arguments are quite profound. So why does he spend

so much time thinking about schools? Surely he had written enough to legitimate philosophic arguments about education for history to see him as the originator of an area of academic study worthy of the title *philosophy of education*. So why does he continue to write about education? Some philosophers in the mainstream academic area view this dimension of Dewey's writings as weak or applicational.

Perhaps you have already anticipated the basis of their mistake. The value that we dare not lose sight of is intellectual growth, and the sociopolitical context in which growth is maximized is a democratic one, in Dewey's sense of the term. If children are sent to schools that either set out explicitly to indoctrinate certain beliefs or to create a wholly permissive environment, they are miseducative in that they are either in the business of memeopathic transmission or the furtherance of intellectual drift. The schools at the time of the rugged individuals were never laissez-faire operations, and thus the methods of teaching were at odds with the values behind the type of society being advocated. We know that it is only the social institutions of government and education (progressive liberals prefer the term *schooling*) *whose central purposes are nonremediation*; so the classical liberals' ideas of good government and good education presented by their talk and actions constitute two sets of mutually inconsistent moral codes.

The existence of a progressive liberal democracy will mean little for children, if they are not introduced to it as a moral code. You might be thinking that we are now into indoctrination. This identifies the importance of having teachers who know the difference between a moral code and indoctrination. Children are taught specific academic (curriculum) content, but always under the demands of: (1) respect for individuality and for the conditions that promote the growth of their personalities; (2) confidence in human intelligence that is formed and informed by means of autonomous inquiry; (3) the right and responsibility for appropriate participation in problems of shared concern (Smith, 1965:243). I submit to you that indoctrination is impossible when these principles are passionately embraced by teachers. It is often said that democracy requires good education, but, in truth, good education requires democracy.

Now we see why Dewey gives so much attention to the methods of schooling. He sees educational institutions as social structures aimed at the development of intelligence, which is always possessed by individuals. To use a botanical analogy, schools are the public institutions whose task is to manage the *cambium* of growth, that is, the area where growth is occurring with greatest rapidity. As we have seen, for every person, there are always tendencies already present. As Dewey emphasized, the role of any teacher or parent is to give direction to these tendencies while adhering to the principles of the ethical way of coming at life.

It is important to recognize that the two nonremedial social institutions actively and conspicuously demonstrate the democratic way of coming at life.

Of course, we are now disappointed in these institutions, but such disappointment reveals our commitment to the values expressed in Philip G. Smith's three principles listed above. One sees that it is not only schools and government but all social institutions that should reflect an adherence to these principles. The progressive liberal's conception of a democratic society is any society whose institutions take the form they do as a result of a conscious desire to provide the conditions of growth for all of its citizens. Providing these conditions is obviously not a simple process. Many values come into play when virtually any social policy is being created. There are, of course, existent societies that are governed by those who seek to limit the growth of the members of that society; but even if all concerned are in agreement that cognitive growth is a desirable goal, these societies are often required to make difficult choices among desirables.

THOMAS WEST'S ATTACK ON DEWEY'S PROGRESSIVE LIBERALISM

Labor is prior to, and independent of capital. Capital is only the fruit of labor, and could never have existed if labor had not first existed. Labor is superior to capital, and deserves much the higher consideration.

—President Abraham Lincoln (First Annual
Message to Congress, December 3, 1861)

Thomas West (1997) sees Dewey as one of the principle offenders in leading America away from the values of the Founders. His criticism of Dewey does, however, grow out of an adequate understanding of Dewey's argument.

According to Dewey, who was probably the most influential theorist of the New Liberalism, the Founders' conception of human rights is grossly inadequate. They were wrong in thinking that human rights are absolute, based on an unchanging human nature: "Natural rights and natural liberties exist only in the kingdom of mythological social-zoology." For Dewey, there are no absolutes. There is only progress or reaction. [West is quoting from Dewey's *Liberalism and Social Action* (L11)] (West, 1997:59)

As we have seen, Dewey takes Darwin seriously, which led him to reject the old conception of knowledge and goodness, once established through reason, as being a fixed and eternal dimension of human existence. If the intelligence of *Homo sapiens* emerged as Darwin describes in *Descent*, and which Dennett argues, then the very notion of givens, such as natural laws and fixed

or static forms of intelligence, is refuted by science. Of course it is comforting to believe that everything one has been taught is good for all time, but this comfort provides a false cognitive security. West continues,

Dewey also thought the Old Liberals were wrong in their belief that “there are two different ‘spheres’ of action and of rightful claims; that of political society and that of the individual,” and that of government should stay out of the private sphere as much as possible. Instead, Dewey said that government must overcome the Old Liberal public-private distinction. In particular, Dewey wanted government to take control of private property, because “private control of the new forces of production . . . would operate in the same way as private unchecked control of political power.” That is, it would be tyranny. (59)

In *Liberalism and Social Action*, Dewey does sound more like a Marxist than anywhere else. As Brameld (1965:135) points out,

True, the student will find that Dewey, in one or two books (most notably, in *Liberalism and Social Action*), is much more critical of the exploitative nature of the capitalist class structure than are many of his disciples—so much so that he sounds at moments quite Marxist in tone. But this emphasis is counterbalanced in other writings by so much regard for experimental processes (he is consistently operational), for pluralism, for individual growth.

It is fair to say that Dewey is sounding some Marxist themes. This small book was published in 1935, a time when “the greatest generation” was experiencing its darkest hours. The nation was in a deep economic depression. People in soup lines were a common sight in the large cities. The general feeling was that the promise of America had slipped away from them.

Dewey calls for changes in the way workers are being treated and argues that they should have some control of the means of production (not own the means of production, a Marxist thesis). I can recall my father’s account of how he saw auto workers, who dropped from heat exhaustion, taken off the line and laid on the grass in the front yard of the plant, with their time cards punched out. If they could recover, they could punch themselves back in. I once heard Walter Ruether (the famous labor organizer) speak of men dying on the grass in front of those auto plants. Dewey, the advocate of respect and the method of intelligence, was angry. How could any reflective person not be? But Dewey is no revolutionary Marxist. As McDermott writes in his introduction to Dewey’s *Later Works*, volume 11, “It is now obvious that for Dewey the battle is between ‘coercive and violent force,’ whether left or right in political persuasion and ‘action directed by intelligence’” (L11:xxi).

West continues, “At the heart of Dewey’s liberalism was his belief in ‘historic relativity,’ his conviction that there is no permanent human nature.” To answer West, we must address the meaning of “permanent human nature.” Recall the distinction between preparedness and plasticity. The innate part of human nature is coded in the genome as preparedness, what Dewey calls “unlearned activities.” (See chapter 3 for Dewey’s analysis of “unlearned activities.”) From now (the time you are reading this) back two or three hundred years, the human nature in our genomes likely has not changed too much—more so in other countries where natural selection is still heavy handed. So, it is simply wrong to say that Dewey has a “conviction that there is no permanent human nature.”

Perhaps the disagreement is over how much preparedness exists in human nature. Assuming that West has read *Human Nature and Conduct* (M14), he knows that Dewey’s argument is that our unlearned activities become habits of conduct by means of our interaction with adults who have already formed such habits. Moreover, since different cultures have different ways of giving meaning to these unlearned activities, cultural factors participate in what we call “human nature.” If West rejects this kind of explanation, then he must be saying that some human *conduct* is coded in the genome. In Dewey’s terms, the claim would be that there are in fact some unlearned activities that have meaning prior to the formation of habits formed through interaction with others. That is, there must be some behavior coded in the genome that has meaning prior to any interaction with culture. West seems to be saying that it is this innate conduct that forms the permanent part of human nature. Such a thesis is definitely at odds with Dewey’s analysis. But it can serve as a criticism of Dewey only if it is true or at least can be supported. As we have seen in earlier chapters, the revolution in biology allows no room for such a thesis, because the evolution of *Homo sapiens* bet the future on increasing plasticity (learning) and not preparedness. Given the last thirty years of research in biology and West’s claims, one wonders if ideology and not science is informing the tenets of contemporary classical liberalism.

According to West, there are two conclusions from Dewey’s view:

First, man does hardly anything on his own; self-reliance and individuality are largely illusory. Qualities like “initiative, inventiveness, varied resourcefulness . . . are not gifts, but achievements.” Even intelligence is not “a ready-made possession of individuals.” That is because the social order, not nature, produces these qualities.” . . . That means there must be something like a cradle-to-the-grave welfare state, financed by government supervision of production and distribution of wealth. (60)

One can see that West is well versed in contemporary classical-liberal doctrine but completely ignorant of any ideas about what Darwin’s theory, coupled

with the last thirty years of research in microbiology and molecular chemistry, means for how we view human development. Because he does not consider the tools we have been discussing in these chapters, West trots out the old meme, “the welfare state.” This meme states that the reason many people are helpless is because the government has assumed the role of taking care of them. George Will (*Statecraft as Soulcraft*, 1983:120–21) a well-known conservative doyen, concludes that governments must provide for human welfare, that is, in part, become a welfare state, a view that received much criticism from some conservatives. If we are to have boundless competition, then what is the responsibility of the state for the losers? In the early part of the 20th century, economic competition and the governmental policies that were thought to support it were producing many losers and few winners. When the losers finally had nothing, the winners found that they were also losers. Should a government claim that it has no responsibility for its policies? Do we not judge policies by their consequences?

Let us go to West’s second point. “[T]here are no natural or divine standards defining the right way of life for man. Ideals and religions are fictions. There are no permanent, objective standards of right and wrong.” West thinks that this makes an individual “essentially a victim or essentially disabled” and that this kind of thinking explains “the New Liberal preoccupation with victimized groups.” Dewey does consider religions to be fictions, but to say that there are no natural standards or that there are no objective standards for judging right or wrong in Dewey’s analyses reveals that either West never read any of Dewey’s writings beyond *Liberalism and Social Action*, or, if he did read more of Dewey, he does not understand the form of naturalistic philosophic arguments. If so, he would not be alone.

West finds more serious mistakes in the progressive liberal thesis. He says, “If we have no inherent inner resources, we must have been socially constructed to dominate or submit. . . . Without the help of government, some people will be exploited, wither, and die. Others, through no merits of their own, will end up on top” (1997:60). If society has any influence over the development of the individual’s character, then, according to West, we will be divided into the dominants and the submissives. Note that he is advancing two either-or categories, that is, either we have “inherent inner resources” or we do not. This overly simplified disjunction is undermined by the preparedness versus plasticity distinction just as is the old nature versus nurture distinction. So his concern that Dewey’s new liberalism would lead to bifurcating society into the dominant and the dominated (his reasons for this are not clear) makes no sense when we think of the point that while there is brain preparedness and plasticity, it is the environment that eventually calls the tune. Ignoring the kind of environment, including the political environment, that we devise for ourselves and our children is a serious mistake, as both the scientific studies in brain science and the ethical analyses of democracy have shown.

West says that in Dewey's view government should go beyond "protecting people against obvious attacks by others" and supporting "strong families."

For Dewey, it is precisely when people are left alone that they are the most vulnerable. Dewey and the early liberals like Franklin Roosevelt worried most about the power of big business over the working man. Today liberals are focused on women, racial minorities, and the disabled. The analysis in both cases is the same. (60)

West seems to have an accurate view of Dewey's conclusions and sees nothing to be gained by giving up the traditional view of the relationship between the individual and society. West is unmoved by Dewey's Darwinian arguments about the importance of the analysis of genesis in the study of natural history. Although it seems obvious that West does not understand (willfully or not) that Dewey is arguing from the perspective of natural history after Darwin, one assumes that these post-Darwinian arguments would not make a difference to West. One might say that the classical-liberal memes have taken over his meme machine, and the great efforts of a memetic engineer such as Dewey are unable to dissuade West's views—to create the conditions that will activate intellectual selection. Unfortunately the classical liberals are much better schooled on their memes than are Dewey's "new" liberals, whom we should now refer to as the "post-Darwinian" liberals. In the years after West's book was published, we find an increase in "the power of big business over the working man" to be a real concern. Those from his side of the argument are creating the corporate state, and it is the "working man" and woman who are being more and more deprived of the conditions of growth—to say nothing of health care and a job to make ends meet.

Finally, the current war on the theory of evolution one finds in America can be seen as the pursuit of a worldview that supports classical liberalism but that constitutes an unconscious (in most cases) attack on the requisite understandings for envisioning, let alone building, a democratic ethic that can draw upon and activate the intellectual resources of *all* the members of our species.

THOMAS WEST VERSUS THOMAS JEFFERSON

The worth of a State, in the long run, is the worth of the individuals composing it.

—John Stuart Mill, *On Liberty* (1859)

It is an interesting fact that as Dewey appeals to Thomas Jefferson in his arguments about the importance of continued intellectual growth at the level of social policy, he is actually giving a rebuttal to West before West was born.

While West considers Thomas Jefferson to be one of the Founders whose thought is undermined by Dewey, Dewey argues that Jefferson's statements show that he was more than a classical liberal. He says that it was Thomas Jefferson who "was the first modern to state in human terms the principles of democracy" (L13:173). Dewey says he is not being provincial because he prefers Jefferson's expression of democracy over the British versions, because "only one who was attached to the struggles of the country to attain its independence, could possibly have stated it as thoroughly and intimately." No wonder that Dewey found a kindred spirit in Jefferson. Notice the quote of Jefferson that Dewey reproduces in *Freedom and Culture* (L13).

I know that laws and institutions must go hand in hand with progress of the human mind. . . . As new discoveries are made, new truths disclosed, and manners and opinions change with the change of circumstances, institutions must change also and keep pace with the times. We might as well require a man to wear the coat which fitted him when a boy, as civilized society to remain ever under the regime of their barbarous ancestors.

Moreover,

The idea that institutions established for use of a nation cannot be touched or modified, even to make them answer their end . . . may perhaps be a salutary provision against the abuses of a monarch, but it is most absurd against the nation itself. (Jefferson quoted by Dewey [L13:174-75])

Consider Dewey's observations about Jefferson:

I have referred with some particularity to Jefferson's ideas on several points because of the proof that it affords that the source of the American democratic tradition is moral—not technical, abstract, narrowly political nor materially utilitarian. It is moral because it is based on faith in the ability of human nature to achieve freedom for individuals, accompanied with respect and regard for other persons and with social stability built on cohesion instead of coercion. Since the tradition is a moral one, attacks upon it, however they are made, wherever they come from, from within or from without, involve moral issues and can be settled only upon moral grounds. (L13:178)

Dewey would say that the thought of Thomas Jefferson is the high-water mark in America's pursuit of a description of the ethical society—perhaps even in human history. I think it is credible to say that Jefferson would say the same of Dewey. Of course, Dewey's arguments are not going to convert West into a progressive liberal, but they do make the point that not allowing the discourse to move from its political beginnings into a thoroughly moral

discussion serves the interests of power and not a “respect and regard for other persons” as moral peers.

Dewey may sound to some quite radical when he says, “The most flagrantly obvious violation of Jefferson’s democratic point of view is found in the idolatry of the Constitution as it stands that has been sedulously cultivated” (L13:175). Thus, Dewey’s review of Jefferson’s thinking becomes an answer to West. “It would be absurd to hold that his [Jefferson’s] ideas were ‘radical’ beyond fear of concentrated wealth and a positive desire for general distribution of wealth without extremes in either direction” (L:13177). Classical liberals (if this term applies to the neoconservatives, who seem to adopt policies that depart far from those we think of as classical liberalism) are quick to label liberal policies as “attempts to redistribute wealth” (another meme) when in fact it is their own policies that redistribute the most wealth to the fewest people, as we have recently seen.

Finally, the above discussion reveals how the Darwinian view can allow one to see that even the most fixed elements of culture must be open to reconstruction as conditions change. Dewey made these points many times with only Darwin’s original statement to underpin his thinking; but today we know that Dewey was right and that science and technology do require frequent updating of social policy. West’s view of Dewey as the threat to democracy, when held up to Jefferson’s mirror, reveals that it is West and his fellow neo-conservatives who worship social rigidity at the expense of the majority, who are on the wrong side of both science and morality. How can we explain the political tenacity of the classical liberals? Is it because of their memeopathy?

IS DEWEY’S THEORY OF MIND TOO OPTIMISTIC?

The government of the absolute majority instead of the government of the people is but the government of the strongest interests; and when not efficiently checked, it is the most tyrannical and oppressive that can be devised.

—John Caldwell Calhoun (Speech, U.S. Senate, 1833)

Diggins (1994) presents a useful review of many of the positions pragmatists have taken over the years. He raises several questions in particular about Dewey’s view of mind. Of interest here is the following: If the mind is formed as a result of biological processes of selection and adaptation, then why do we find the minds of contemporary humanity so willing to engage in activities or projects that are against their best interests? He says that various writers

see the tragic “human condition” as springing from the disquieting awareness that man is part of nature, yet aspires to be more than nature. After such

awareness, nature and spirit part company, and man is left with the task of changing the natural world and not necessarily the duty of comprehending it. Pragmatic man identifies knowledge with control rather than understanding, with mastery rather than meaning. That he continues to act upon nature to control its processes may enlarge man's intellectual faculties, as Dewey insisted; whether such practical activity can provide anything more than mere expedient knowledge with which to exploit the natural world remains unclear. (1994:224)

The notion that Dewey would say that we are part of nature but that we aspire to be more than nature is absurd, as I hope this book establishes. Dewey does make clear that what he refers to as a spirit or an ideal cannot come from science, but the suggestion that Dewey allows these to "part company" with nature is another absurdity.

Why Diggins thinks this leads us to tear into nature with no understanding of its processes is not clear. Diggins is interpreting Dewey's pragmatism as vulgar pragmatism, that is, the view that all that really matters is whether we get what we want. Vulgar pragmatism falls apart as soon as we ask, what are the *possible* things that one could want? Any proffer of a possible want has credibility only if it emerges from a theory of possibility. Such a theory will set forth, whether well or poorly, explanatory principles derived from the study of nature. If the post-Darwinians are up to anything, it is understanding nature. I simply do not understand how Diggins can see Dewey as shirking this "duty." He is always asking for more scientific research. If you look at the post-Darwinians (Daniel Dennett, Richard Dawkins, Francis Crick, James Watson, and Steven Pinker (2002), *inter alios*), you find page after page of argument that we had better understand nature, as a moral imperative, before we go about prescribing how things ought to be.

Diggins' remarks suggest that pragmatism is only interested in how to control nature, that is, practical questions and not theoretical ones. Within the context of a specific problem, one can classify the problem as practical or theoretical by means of the following distinction. Solving a practical problem (adequately answering a practical question) means that no more, at least significantly fewer, problems are generated. If every time an office manager solved a problem, many new problems were generated, we would think that we were dealing with an incompetent manager. However, if a theoretical problem (question) is solved or answered, we expect to have many new problems. Solving a theoretical problem is often referred to as "a breakthrough," which generates new problems. When it was discovered by Sir Walter Reed that it is the female *anopheles* mosquito that carries the malaria bacterium, many new questions suddenly arose. Why is it the female, and only the *anopheles*? Does life cycle or reproductive cycle have anything to do with its carrying the disease?

While the practical-theoretical distinction works in limited contexts, more often than not the two kinds of problems readily flow together. What is the best way to sharpen an axe? There was a time when questions did not get any more practical than that. From that question, geology and metallurgy were just around the corner. Or consider the things that NASA tries to do. We have an obvious example of where “expedient knowledge with which to exploit the world” (or the Moon, or Mars) immediately pushes the issue beyond technological questions. Recall that in Dewey’s writings we are always being told about continuities. He would grant the practical versus theoretical classification of questions posed above, but, in the next breath, he would point to an underlying continuity between the two.

Diggins continues in the next paragraph.

Dewey was, of course, perfectly aware of this human predicament. He happily accepted a definition of existence that depicted active man laboring to organize and control an unfinished and ever-evolving environment. Indeed man’s continual need to “readjust” to nature sparked the life of the mind that dramatized the height of human ingenuity. Yet Dewey’s biological approach to human development prevented him from seeing also how the insecurities of existence result in the drive toward power as much as in the use of intelligence. (1994:224)

The quest for power does come from the insecurities of existence, as the Adlerian psychologists have long held. While seeking power as a way to overcome feelings of self-doubt is a self-defeating move, we see the pursuit of controlling others as quite common. Without reference to the brain abnormalities, genetic defects, or plain old character flaws that produce psychopaths or sociopaths, those who seek attention, power, revenge, or to conceal their fears of inadequacy have been miseducated by family or social institutions. Anyone who has read *Human Nature and Conduct* (M14) comes away with the belief that Dewey is able to analyze human feelings and emotional processes as well as the cognitive aspects of life.

In the next paragraph, Diggins says,

The difficulty stems from the pragmatist’s refutation of Cartesian rationalism, especially the notion that thought is a fixed possession and mind a pure faculty to which self-evident truths are revealed. Dewey’s own explanation of the origin and nature of mind derived from Darwinism. Steeped in the language of “process,” “struggle,” and “adaptation,” Dewey believed that mind and intelligence evolved in response to an unstable environment. Does it follow, then, that the meaning of mind and intelligence can be identified with the response as such? (224)

When Diggins says that pragmatism refuted Cartesian rationalism, he seems to be saying that while we burned the boat, and it had to be burned (he said

“refutation”), what do we do now with no boat? He sounds as if he is in agreement with Russell as to how we think about the mind.

In the next paragraph, Diggins says,

The contemporary ecological crisis would also suggest that man is *dangerously maladaptive* and often acts against his best interests. The pragmatic view of mind as responding to its biophysical environment can hardly explain why the American mind decided to impose an industrial system on a natural landscape. (225; emphasis added)

How can this statement be seen as anything more than pure confusion? Natural selection *forces adaptation* (under pain of death) on those genomes subject to its selection pressure. If Dewey bases his philosophic analyses on evolutionary principles (a naturalized approach to meaning), does this suggest to anyone that Dewey thinks there is some sort of selection pressure on our reflective intelligence that will force us to adapt? Those life forms that natural selection eliminated made no conscious choices. They are not responsible for their genomic shortcomings. However, life forms with minds *do* have responsibilities for their choices. To hold that there is some sort of selection pressure on reflective-intelligent choices that forces these choices to become nonself-defeating requires an appeal to some sort of *supernatural* selection. The explanation of this confusion must emanate from Diggins’ wanting to draw a categorical conclusion from Dewey. But Dewey presents us with a hypothetical conclusion; that is, if we want sustainable growth, then there are certain ethical principles that must be respected. Dewey was optimistic about the legitimacy of this hypothetical, though one gets the feeling that he was less so about his readers’ ability to understand it.

What is the promise of pragmatism? If we are to use this language, then it is true that Dewey promised that if we take seriously the ability of evolutionary theory to provide the basis for a naturalistic theory of meaning, then we can develop general principles that provide the conditions for peace and prosperity. This promise was kept.

So why is it that so many people choose social practices and policies that are not in their interests? This is a psychological question much like, why are religious beliefs on the rise in America? Why people embrace classical liberalism or Christianity may be a topic for evolutionary psychology, and while it is not a matter for natural selection, it is probably a matter of meme engineering. As Lakoff (1996; 2002) points out, the neoconservatives have spent millions on think tanks developing what we would call “political memes”—what we have been calling “memeopathy.”

Think back to Dewey and his view of democracy as a way of coming at life’s questions—as a way of insuring the greatest participation in problems of shared concern. Think of Dewey’s analysis of democracy as a metameme (a meme for judging memes) that should also be inserted into minds, along with

either liberal or conservative memes. What would be the effect of inserting Dewey's democracy memes in American brains? Are some memes more appealing, independent of the salesmanship involved? It is impossible to say, for as Dennett observes, we do not as yet have studies to explain the evolution and survival of music.

On the positive side, we can say that West's and Diggin's criticisms of Dewey do seem to have traction in the absence of an understanding of evolution, but when we see how Dewey uses Darwin's explanation to reconstruct philosophic analysis, their objections seem sophomoric. The great understandings of knowledge and morality that Dewey's writings offer us are accessible only if we come to a basic understanding of contemporary science. Could it be that while we have read John Dewey, we have never really understood him?

CONCLUSION

This chapter focused on the conflict generated between the classical liberals' view of liberalism and Dewey's view of a progressive liberalism. While classical liberalism did free us from the domination of monarchy or civil authoritarianism, it is preevolutionary and should be reformed in light of the insights produced in the last thirty years of research in biology. It is remarkable how Dewey's use of evolution in his arguments has been vindicated by the current thinking in evolutionary theory and by Dennett's philosophic arguments. Dewey pointed out how the deficiencies within classical liberalism render it an obstacle to the continuing development of liberalism and, thus, intelligence. It was shown that when classical liberals appeal to the Founders for support, they encounter a rejection of their ideas by at least one of the most prominent Founders, Thomas Jefferson. The claim that Dewey's thinking is wrong because its reliance on evolutionary principles has not led to widespread social adaptation, and, thus, social harmony, was considered and found to be ill-conceived. Natural selection and preminded adaptations are no longer relevant to explanations of what form cultures take, because we are now in the period where cultural changes are a matter of intellectual selection. It was suggested that Dewey's analysis of democracy can be seen as generating a set of mememes that are significant for the direction and evaluation of uses of intellectual selection to generate social policy.

CONSIDER READING

1. Dewey's "Philosophies of Freedom" (L3:92–114) is an analysis of various views of freedom. It also provides a further critique of classical liberalism.
2. Dewey's two books *Liberalism and Social Action* (M5) and *Individualism: Old and New* (L5) provide additional discussions of the ideas in this chapter.

Afterword

The bacterium, *Thermus aquaticus*, said to Richard Dawkins (2004:558):

Look at life from our perspective, and you eukaryotes will soon cease giving yourselves such airs. . . . Why, the very cells that build you are themselves colonies of bacteria, replaying the same old tricks we bacteria discovered a billion years ago. We were here before you arrived, and we shall be here after you are gone.

Is *Thermus aquaticus* correct? Will we, by means of our minds, be here a million years from now and be able to say to *Thermus aquaticus*, “We’re still here”? Or, will we become part of the fossil record because it turned out that we devised our own destruction? All life forms face uncertainty, but our minds can help us deal with the future, not because we have found an algorithmic solution to the problem of induction but because our minds give us an edge in the biological arms race. The more we understand about how we came to be, the better we can construct physical, biological, and social structures that contribute to our continued existence. Such existence, however, can never be fully satisfying without our deliberate and sustained pursuit and protection of the conditions that promote intellectual growth.

If it turns out that *Thermus aquaticus* was right after all, it will not have been because a philosopher from Vermont did not spend a lifetime trying to show us how to prevent it.

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