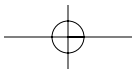
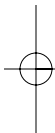
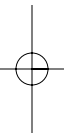


Literary Darwinism



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*Evolution, Human Nature,
and Literature*

by
Joseph Carroll

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Introduction

An Emerging Research Program

In the past decade or so, a small but rapidly growing band of literary scholars, theorists, and critics has been working to integrate literary study with Darwinian social science. These scholars can be identified as the members of a distinct school in the sense that they share a certain broad set of basic ideas. They all take “the adapted mind” as an organizing principle, and their work is thus continuous with that of the “adaptationist program” in the social sciences. Adaptationist thinking is grounded in Darwinian conceptions of human nature. Adaptationists believe that all organisms have evolved through an adaptive process of natural selection and that complex functional structure in organic development gives *prima facie* evidence of adaptive constraint. They argue that the human mind and the human motivational and behavioral systems display complex functional structure, and they make it their concern to identify the constituent elements of an evolved human nature: a universal, species-typical array of behavioral and cognitive characteristics. They presuppose that all such characteristics are genetically constrained and that these constraints are mediated through anatomical features and physiological processes, including the neurological and hormonal systems that directly regulate perception, thought, and feeling.

Adaptationist social scientists identify “the adapted mind” as the foundation of human culture. Adaptationist literary scholars concur, and they seek to bring literature itself within the field of cognitive and behavioral features susceptible to an adaptationist understanding. They identify human nature as a biologically constrained set of cognitive and motivational characteristics, and they contend that human nature is both the source and subject of literature. They are convinced that through adaptationist thinking they can more adequately understand what literature is, what its functions are, and how it works—what it represents, what causes people to produce it and consume it, and why it takes the forms it does.

In this introduction, I shall try to give a sense of where Darwinian literary study now stands and suggest where it might be headed. After sketching out the history of Darwinian social science, I shall distinguish the adaptationist research program from other forms of “evolutionary” thinking in literary study. I shall identify the main contributors to adaptationist literary study and list some of their accomplishments. I shall also take up two large theoretical issues that remain to be resolved: the exact structure of “human nature,” and the

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adaptive function of imaginative constructs. In the final section, I shall describe the essays that are included in this volume.

The *Origin of Species* was published in 1859 and within a decade it had almost completely changed the general view of evolution in the minds of the educated public. While writing the *Origin*, Darwin had been fearful of endangering his general theory of evolution by alarming people in their most tender ideological anxieties. Consequently, he had mentioned human beings only in passing. Close to the end of the *Origin*, surveying the prospects for the theory he has propounded, he declared, "In the distant future, I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history" (2003, p. 397). The future was not so distant as Darwin fancied, at least not in the short run. Darwin was himself much surprised by the magnitude of his success in establishing the basic principle of "descent with modification," and the success gave him the heart to fulfill his own prediction—to throw light on man and his history, and to place psychology on a new foundation. In *The Descent of Man, and Selection in Relation to Sex* (1871), he located human beings in their ancestral lineage as primates. On the basis of evidence from comparative anatomy and embryology, he concluded that "man is descended from a hairy quadruped, furnished with a tail and pointed ears, probably arboreal in its habits" (vol. 2. p. 389). (*The Expression of the Emotions in Man and Animals*, first published in 1872, is a psychological and anatomical sequel to *The Descent of Man*).

Like many (but not all) of their primate cousins, the specifically human descendants of this hairy quadruped were highly social in nature, and much of *The Descent of Man* is given over to analyzing the origin, function, and character of human social behavior. Darwin provides a classic account of human moral psychology. He identifies two central elements in moral feeling: an evolved social sympathy that humans share with other social animals, and a capacity for assessing the significance of particular actions within longer rhythms of life. This latter capacity is one of those peculiarly human cognitive aptitudes. The rudimentary elements for such aptitudes can be found, Darwin argues, in other animals. There is no human characteristic that is not continuous with characteristics of other primate species, but in human beings those characteristics develop and combine in ways that produce capacities unique within the animal kingdom. One such capacity is the moral sense. Another is language, and it is on language, Darwin speculates, that all higher cognitive human development depends. Darwin succeeds in analyzing human psychology and culture in ways that lead back through unbroken causal sequences to the elementary biological drives toward survival and reproduction. He is thus the first sociobiologist and the first evolutionary psychologist, and it is for this

reason that one will often see the epithet “Darwinian” used more or less synonymously with epithets like “sociobiological” or “adaptationist.”

The revolution Darwin began in psychology and the other social sciences has not yet been completed. Through the first decade of the twentieth century, educated people interested in society and literature understood that their own ideas had to be integrated with Darwin’s new conception of man’s place in nature. Among his distinguished successors in this period, we can identify T. H. Huxley, Leslie Stephen, Francis Galton, William James, John Dewey, and Thorstein Veblen. Literary figures heavily influenced by Darwinian naturalism include George Eliot, H. G. Wells, Joseph Conrad, Thomas Hardy, and an array of naturalists such as Émile Zola, Frank Norris, Arnold Bennett, and Jack London. (Literary Darwinism extends down to the present through a lineage that includes Aldous Huxley, William Golding, Kurt Vonnegut, and Ian McEwan.)

In the second decade of the twentieth century, an anti-Darwinian counter-revolution conquered the social sciences and from there spread out to become the dominant public ideology of the century. Social theorists such as Émile Durkheim, Franz Boas, Alfred Kroeber, and Robert Lowie propounded the doctrine that culture is an autonomous agency that produces all significant mental and emotional content in human experience. From this culturalist perspective, innate, evolved characteristics exercise no constraining influence on human motives or thoughts. Evolution produced the human brain, but that brain invented culture, and culture has succeeded in cutting itself loose from all direct biological influence. This concept of cultural autonomy became the cornerstone of standard social science, and until the 1970s Darwinism essentially disappeared from professional social theory. Important work in Darwinian epistemology was accomplished in the mid-century period by both Konrad Lorenz and Karl Popper, but the first major professional challenge to cultural autonomy as the ideology of the social sciences appeared in 1975, with the publication of Edward O. Wilson’s *Sociobiology: The New Synthesis*. Wilson offered a comprehensive analysis of the social behavior of animals within the explanatory framework of natural selection. His final chapter, extending this analysis to the human animal, provoked a series of violent rebuttals, but it also helped inaugurate a line of research that has since grown at ever-accelerating rates. (On the history of Darwinian social science, see Alcock, 2001; Brown, 1991, pp. 1–38; Buss, 1999, part 1; Degler, 1991; Fox, 1989, chapters 3 and 4; Freeman, 1992, 1999, pp. 17–27; Segerstråle, 2000; Tooby and Cosmides, 1992, p. 28; E. O. Wilson, 1994, chapter 17.)

Over the past three decades, Darwinism has had a major impact on psychology, philosophy, political science, linguistics, and aesthetics. Dozens of books and thousands of articles have been published in these areas; many distinguished Darwinian researchers now hold key positions at major research institutions; and there is a steady stream of serious but accessible publications

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aimed at both professional scientists and the educated lay public. Every year, the nonfiction bestseller lists include some work of Darwinian psychology or Darwinian ethical theory. It could not yet be said that Darwinism dominates the social sciences, but it can reasonably be predicted that within two decades this transition will have advanced far enough so that the modifying term “Darwinian” will be quietly dropped from the substantive term “social science.” The epithet will be redundant because all educated people will take it for granted that no reputable psychologist or anthropologist can ignore the findings of biologically oriented study, and even sociologists and political scientists will have to accommodate themselves to the reality of what is empirically known about the biological basis of human behavior. (Representative contributions to sociobiology and evolutionary psychology include Alexander, 1979, 1987; Arnhart, 1998; Betzig, 1986, 1997; Bickerton, 1990; Bowlby, 1982; Brown, 1991, 2000; Buss, 1990, 1994, 1995, 1999, 2000; Chagnon, 1979; Chagnon and Irons, 1979; Chiappe and MacDonald, 2003; Cosmides and Tooby, 1992, 1994; Crawford and Krebs, 1998; Cronk, Chagnon, and Irons, 2000; Daly and Wilson, 1983, 1988; Darwin, 1981, 1998; Dawkins, 1987, 1989; Eibl-Eibesfeldt, 1989; Ekman, 2003; Eysenck, 1967, 1980; Geary, 1998; Hamilton, 1996, 2001; Hrdy, 1999; Irons, 1998; Low, 1998, 2000; MacDonald, 1990, 1995a, 1995b, 1997; McGuire and Troisi, 1998; Maxwell, 1991; Mithen, 1996, 2001; Pinker, 1994, 1997b, 2002; Ridley, 1997, 1999; Rushton, 1995; Segal, 1999; Segal and MacDonald, 1998; Symons, 1979, 1992; Tiger and Fox, 1971; Tooby and Cosmides, 1992, 2001; Trivers, 1972, 1985; Williams, 1966; D. S. Wilson, 1999, 2002, in press; E. O. Wilson, 1975, 1978, 1998; J. Q. Wilson, 1993.)

It seems likely that within two decades the sheer force of progressive empirical knowledge will almost inevitably bring about a fundamental transformation in the social sciences. In all likelihood, the humanities will eventually follow in the train of this movement, but they will probably be slow and late in catching up. The conceptual shift that takes place when moving from the Darwinian social sciences to the humanities can be likened to the technological shift that takes place when traveling from the United States or Europe to a country in the Third World. While traveling in space, one also moves backward in time. In the humanities, scholars happily confident of their own avant-garde creativity continue to repeat the formulas of Freud, Marx, Saussure, and Lévi-Strauss—formulas that have now been obsolete, in their own fields, for decades. It is as if one were to visit a country in which the hosts happily believed themselves on the cutting edge of technological innovation and, in support of this belief, proudly displayed a rotary-dial phone, a manual typewriter, and a mimeograph machine.

There are many literary scholars, and especially younger scholars, who are eager to make productive use of the best available information about the human mind and human behavior. The conceptual time lag in the humanities presents grave institutional problems for these scholars. Among their col-

leagues in the mainstream literary establishment (exemplified by the Modern Language Association), they are almost certain to meet very often either with blank incomprehension or with outright hostility. This problem is particularly acute for young scholars at the beginning of their careers, trying to put together dissertation committees or flinging themselves on a job market that is already sufficiently inhospitable even for those who are willing to conform to established views

Despite these real and serious institutional obstacles, a substantial body of work has now been published in Darwinian literary studies, and it seems likely that this movement will not only continue but also that it will expand at an increasing rate. The more that is published, the more momentum the whole movement has—the more there is to work with, and the more plausible and possible the whole enterprise seems. One element certain to be important, but hard to calculate, is the simple exhaustion of rhetorical variations in the movements that have now been current for some two or three decades—a period of time sufficient for a fresh doctoral graduate to have passed through maturity and to have entered into the declining phase of his or her career. Deconstruction as a method pure and sufficient unto itself lasted scarcely a decade before giving way to the politically saturated discourse theory of Foucault, and radical political ideology has perhaps already exhausted the range of important social groups that can plausibly be represented as oppressed minorities. After the vast groundswell of feminism and the minor tides of postcolonialism and queer theory, no truly new political impulse has animated literary study now for more than a decade, and no essentially intellectual impulse has been felt for something like three decades. The only major new subject area that has appeared in the past decade or so has been ecological literary study, or “ecocriticism,” and in respect to its theoretical orientation this school has teetered uncertainly between postmodernism and a quasi-Darwinian naturalism. (See Fromm, 1996, 1998, 2001; Glotfelty and Fromm, 1996; Love, 1999a, 1999b, 2003; and in this vol., see part 1, chapter 8; part 2, chapter 4.)

How soon will the stale and etiolated rhetoric of postmodernism crumble from within? How quickly will judicious practitioners make use of the robust theory and provocative information flooding in from adaptationist social science? In *Evolution and Literary Theory* (1995), I glumly foretold dim decades of obstruction and stasis in literary studies. Now, just a few years later, I am more hopeful for faster movement. In the middle of the 1980s, how many people foresaw the imminent collapse of the Soviet Union? I have no basis for confident predictions about the pace of change. What I can say, repeating my earlier conclusion, is that for those of us who cannot tolerate the prospect of stagnating in the backwaters of self-trivializing ideologies, there is no need to wait for the established intellectual bureaucracy to shift its own massive bulk and break through its own obstructions. “Whatever happens within the critical institution as a whole, the pursuit of positive knowledge is available to any-

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one who desires it. Within this pursuit, the opportunities for real and substantial development in our scientific understanding of culture and of literature are now greater than they have ever been before" (p. 469). In the few years that have elapsed since that statement was written, the developments in positive knowledge have continued to accumulate, and the programmatic claim that literary scholars can make use of this knowledge has been rapidly confirming itself as a practical reality. Even just a few years ago, the term "adaptationist literary study" could claim to be little more than a speculative and predictive abstraction. Through the work they have already done, a substantial cadre of scholars has now given definition and detail to that abstraction.

Non-Adaptationist Forms of Evolutionary Criticism

Adaptationist literary study can be distinguished from other forms of "evolutionary" literary study by reference to a simple causal sequence. Adaptationists would affirm the following two causal propositions: (1) the mind has evolved through an adaptive process of natural selection; and (2) the adapted mind produces literature. Adherence to this causal sequence can be contrasted with at least three other distinct ways of integrating evolution with literary study: (1) cosmic evolutionism; (2) evolution taken as an analogical model; and (3) evolution taken as a normative value. All three of these alternatives to the adaptationist program seem to me fundamentally misconceived. Here I shall only briefly characterize them and explain why I think they are misconceived.

The theory of cosmic evolution is the belief that the universe itself is evolving, driven by some inner principle of complexification. In most versions, this principle is teleological and spiritualistic; that is, the universe is conceived as evolving *toward* some higher, ultimate state of spiritual and/or social perfection. In the field of metaphysics and cultural theory, this general view of things can be credited to Herder, Hegel, and the German Romantics and proponents of *Naturphilosophie*, but it is a diffusive, pervasive aspect of cultural and literary theory throughout the nineteenth century. In social theory, it animates Marx as much as Hegel, and it shapes the thinking of progressive liberals like Arnold and Mill and even of utilitarians like Comte and Spencer. In biology proper, it is a distinguishing feature in the theory of Lamarck, and it is continued in the biological thought of Spencer (1862) and of Teilhard de Chardin. Among contemporary literary theorists, its adherents include Walter Koch (1993), Frederick Turner (1992), Alex Argyros (1991), and Richard Cureton (1997a, 1997b). When they adopt its most robust forms, proponents of this theory are metaphysical formalists. That is, they identify some autonomous, self-generating and self-regulating formal process, and they depict this formal process as the central causal force that is responsible for "evolution" or "development" on every level of phenomenal process: cosmology (astronomy), geology, biology, psychology, culture, language, and literature. As a set of comprehensive cosmic formulas, such theory can be combined with virtually any

other conceptual apparatus or set of jargon terms. In recent times, it has been combined with, among other things, structuralist anthropology and linguistics, deconstructive epistemology (if that is not itself an impermissibly oxymoronic designation), chaos theory, and ecological theory.

In my own view, such thinking sounds the last echo of medieval theological speculation. It operates chiefly in the range of fanciful metaphysics. Insofar as it makes use of empirical information, it subordinates that information to abstract formulas that are generated *a priori*. Empirical information is used only to ornament and illustrate preconceived ideas, and these ideas are not subject to falsification through new empirical findings. In its style and manner, work done in this vein tends to exemplify a variety of quirks and defects. Some of it (Koch, Cureton) is truly medieval in its pseudo-technical proliferation of formal patterns—a style reminiscent of the symbolic elaborations of alchemical and astrological theory. Some of the writing in this school is verbally opaque, either through an affinity with scholastic theology (Koch) or deconstructive metaphysics (Argyros). In the work of Frederick Turner, cosmic evolution articulates itself in an effusively lyrical manner that seeks affiliation with the poetry of the English Romantics and the American Transcendentalists. (Koch, Turner, and Argyros are reviewed in this vol., part 1, chapter 5.)

The second misconceived way in which to adapt evolutionary theory to literary purposes is to take evolution as an analogical model—to use a metaphor as a conceptual framework. This is a shortcut to causal thinking, and it is another version of formalism. The analogical theorist takes it for granted that the causal processes in one field will provide a neat and reliable pattern for processes in other fields. In evolutionary theory proper, organisms vary in random ways. Variations differ in the degree to which they enable the organism to survive and reproduce. Variations are heritable, and the heritability of more adaptive variations leads in time to speciation, or, in Darwin's terms, "descent with modification by means of natural selection." How can this causal sequence be adapted to the problems of culture and literature? Thomas Kuhn envisioned scientific disciplines as branching into separate, incommensurable "species" (1991, pp. 7–8). Psychologist Donald Campbell (1988) sought to generalize all intellectual creativity as a form of random variation and adaptive selection; and there is now afoot a project at the University of Michigan to provide statistical data supporting the notion that science fiction "evolves" through an adaptive evolutionary process. Describing the underlying logic of the University of Michigan Genre Evolution Project, Rabkin and Simon explain, "Cultural creations evolve in the same way as do biological organisms, that is, as complex adaptive systems that succeed or fail according to their fitness to their environment" (2001, p. 45). This theoretical assertion does not appear to be the result of empirical inquiry or reasoned causal analysis. It is an imaginative inspiration supported only by emphatic affirmation. The likelihood that complex causal processes in any one phenomenal area will exactly parallel

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those in some other area is vanishingly slight. It is for this reason that, as biological historian Michael Ghiselin observes, “the history of thought is strewn with the corpses of strictly analogical argument” (1969, p. 146).

The currently most popular use of evolution as an analogical causal model is the idea of “memes” first conceived by sociobiologist Richard Dawkins (1982, 1989). Memes are supposedly units of cultural symbolism that survive and replicate in a fashion parallel to that of “genes.” Examples of successful memes include Christianity, Mickey Mouse, and the idea of “memes” itself. The supposed parallel between genes and units of cultural symbolism is radically imperfect. Genes are “self-replicating,” but units of cultural symbolism are repeated only if they activate responses in a human mind; they are stimuli, not organic mechanisms organized for self-replication. The causal mechanisms involved in transmitting cultural patterns involve complex interactions of psychological dispositions and environmental circumstances. Theorists who use the “meme” metaphor as a shorthand designation for these complex processes almost invariably get caught up in confusing causal associations that are appropriate to the source of the metaphor (genes as self-replicating units), but not to the subject the metaphor is taken to illustrate (semiotic stimuli the repetition of which depends on complex causal processes external to the stimuli).

The use of evolution as an analogical causal model has a clear kinship with the third literary misuse of evolutionary theory: taking evolution as the basis for normative value judgments. This application is perhaps most familiar in the form associated with the social Darwinists and the Nietzscheans. In this scheme of things, all natural relations are conceived as violent and hostile, and that conception of nature is used to authorize violent domination as a social, political, or literary norm. In a contrasting scheme, utopian conceptions of the natural order as a harmonious ecosystem are used to authorize norms of pacific concord. In contemporary literary theory, violent domination is not often touted as a viable norm, but the idea of evolution as random and chaotic has sometimes been taken to support deconstructive principles of indeterminacy. In all such conceptions, whether aggressive or pacific, evolution is reduced to one aspect, an aspect that correlates with human values, and that reduction is then used to justify the human norm that guided the reduction in the first place. This process is a little like selectively using the Bible to justify whatever social, political, or aesthetic values one wishes to propound. The appeal of such usage is that the source can be taken to justify virtually anything, even values radically opposed to one another. That universal utility is of course also a fatal theoretical weakness. Evolutionary processes involving speciation operate at time scales and on levels of biological organization far broader than those of human social interaction, but the adaptive process has produced humans with species-typical moral and aesthetic dispositions. The adaptationist understanding of ethics and aesthetics operates at the level of those dispositions, not at the level of the large-scale causal processes that produced them.

We can mention one more school that cites some of the same sources as the adaptationists but remains distinct from them. The “cognitive rhetoricians” affiliate themselves with a branch of cognitive psychology that confines itself largely within the range of linguistic philosophy—thus avoiding the questions of basic human motivational structures that interest evolutionary psychologists. The main theoretical source of the cognitive rhetoricians is the work of language philosophers Mark Johnson and George Lakoff, who have developed a system for analyzing abstract concepts as metaphors drawn from basic percepts of physical space and bodily orientation. The most prominent practitioner in this field is Mark Turner, and it is represented also by Mary Thomas Crane, Tony Jackson, Alan Richardson, Ellen Spolsky, Francis Steen, and Lisa Zunshine. The distinction between these two schools is by no means absolute, and some scholars occupy a borderline position between them (see Boyd, 1999; Easterlin, 2002). The cognitive rhetoricians tend to seek common ground with the discourse theory of poststructuralism, and they are uncomfortable with adaptationist claims that human nature consists in a highly structured set of motivational and cognitive dispositions that have evolved through an adaptive process. Such claims are, they feel, “reductive.” The adaptationists would not disown the epithet. They would concur with E. O. Wilson’s assertion that “the heart of the scientific method is the reduction of perceived phenomena to fundamental, testable principles” (1978, p. 48). (For a sympathetic survey of cognitive rhetoric, see Hart, 2001; and in this vol., less sympathetically, see the commentary on M. Turner in part 1, chapter 5, and part 2, chapter 1.)

Contributions to Adaptationist Literary Study

Adaptationist thinking in literary theory can be traced back as far as the work of Darwin’s contemporary Hippolyte Taine, and it enters into the literary theory and criticism of a few major writers in the later nineteenth and early twentieth centuries, notably into that of Émile Zola, Leslie Stephen, and (with heavy qualifications) Carl Jung. Except for the indirect influence of Darwin through Jung’s archetypalism—as in the work of Northrop Frye—adaptationist thinking had little influence on the development of mainstream critical theory through most of the twentieth century. The New Critics who dominated the academic establishment from the 1930s through the 1970s propounded ostensibly formalist doctrines that were, for the most part, grounded in romantic and Christian conceptions of the autonomous power and quasi-spiritual significance of the literary imagination. The main contextualist or “extrinsic” alternatives to the formalist or “intrinsic” criticism of the New Critics were those of old-fashioned Freudian and Marxist theory. The poststructuralist regime ushered in by deconstruction inverted the New Critical orientation toward harmony and resolution but perpetuated and extended New Critical doctrines on the hermetic autonomy of the textual universe. (See Abrams, 1995, 1997; Carroll 1995; and in this

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vol., see part 1, chapter 2.) With a few exceptions, most of the biologists, anthropologists, and psychologists who have made seminal contributions to Darwinian social science have had little expertise in the humanities and have not had much to say about art or literature as a product of the adapted mind. The first stirrings of adaptationist thinking among literary scholars began in the late 1980s and early 1990s.

My own interests were turned in this direction in the early 1990s. I was profoundly dissatisfied with the irrationalism and textualism of the prevailing literary doctrines, and in adaptationist research I found a solid basis for developing alternative views about such matters as personal identity, sexuality, gender, the family, social motives, and the relation between the mind and the world. Unbeknownst to me at the time, similar dissatisfactions, hopes, and ambitions were animating several of my contemporaries. While I was conducting the research that eventuated in *Evolution and Literary Theory*, Robert Storey was working on *Mimesis and the Human Animal: On the Biogenetic Foundations of Literary Representation* (1996; reviewed in this vol., part 1, chapter 5). A preview article from Storey's book appeared in a collection of essays, *After Poststructuralism: Interdisciplinarity and Literary Theory*, coedited by Nancy Easterlin and Barbara Riebling (1993). This collection also contained one of Easterlin's own articles, "Play, Mutation, and Reality Acceptance: Toward a Theory of Literary Experience," and in the subsequent decade Easterlin (1999a, 1999b, 2000, 2001a, 2001b) has remained an active contributor to adaptationist literary studies. In the late 1980s, Brett Cooke had already begun producing a series of articles taking an adaptationist perspective on Russian literature, science fiction, opera, ballet, and cinema, and he has coedited two collections of essays, *Sociobiology and the Arts* (Bedaux and Cooke, 1999) and *Biopoetics: Evolutionary Explorations in the Arts* (Cooke and Turner, 1999). (Both volumes were based on small conferences and contain essays of varied quality.) Cooke's theoretical and interpretive efforts (1995, 1999a, 1999b, 1999c, 1999d) have now culminated in the first scholarly and critical book focusing on a single literary work, *Human Nature in Utopia: Zamyatin's We* (2002). One way to get a sense of the diverse sorts of work being done in this field is to dip into the three special journal issues that have been devoted to adaptationist literary study: *Human Nature: An Interdisciplinary Biosocial Perspective* 6, no. 2 (1995); *Interdisciplinary Literary Studies* 2, no. 2 (2001, edited by Brett Cooke); and *Philosophy and Literature* 24, no. 2 (2001). In addition to essays by the scholars already mentioned (Carroll, Cooke, Easterlin, and Storey), these collections contain essays by Brian Boyd (2001), Robin Fox (1995), Jon Gottschall (2001), Ian Jobling (2001a), Margaret Nesse (1995), and Michelle Sugiyama (2001b). Jobling (2001a, 2002) and Sugiyama (1996, 2001a, 2001c) have published other articles in the field, and Boyd, Gottschall, and Sugiyama have articles in press. Articles in Darwinian literary study have

also been published by Barash and Barash (2002), Evans (1998), Fromm (2003a, 2003b), Nordlund (2002), Thiessen and Umezawa (1998), and Whissel (1996). Gottschall and D. S. Wilson have in press a coedited volume, *Literature and the Human Animal*, that will contain articles by both literary scholars and social scientists—including articles by Carroll, Gottschall, Nettle, and D. S. Wilson. (For more detailed commentary on specific contributions to adaptationist criticism, see Carroll, 2003a, in press.)

In the middle of the 1990s, several of the scholars who took an adaptationist approach felt it necessary to clear the ground by conducting polemical campaigns against the prevailing postmodern views. Easterlin's collection *After Post-structuralism* contained a diverse array of scholars hostile to poststructuralism and anxious to bring literary study within the general purview of a realist and rationalist orientation. In *Evolution and Literary Theory*, I integrated adaptationist theory with concepts from traditional literary theory and used the resulting theoretical system to repudiate poststructuralist precepts—specifically the ideas that language constructs the world and that the world is fundamentally incoherent and unknowable. The book was about evenly divided between positive theoretical construction and polemical assault. Similar aims and proportions characterized Storey's *Mimesis and the Human Animal*. In the wider field of an adaptationist aesthetics concerned with all the arts, Ellen Dissanayake conducted a similar campaign in *Homo Aestheticus: Where Art Comes from and Why* (1995b). In "Jane, Meet Charles: Literature, Evolution, and Human Nature" (1998), Brian Boyd offered an introductory exposition of evolutionary psychology, summarized the opposition between adaptationism and poststructuralist doctrines, and illustrated the interpretive potential of adaptationism by giving a sharply focused sociobiological reading of Austen's *Mansfield Park*.

I would say that we are now finally getting past the need for such polemics. It is not that the mainstream literary establishment has seen the error of its ways and has humbly set about amending them. Far from it. But the case against poststructuralism has been made very thoroughly from a number of angles. Those who care to rehearse these issues have ample sources at their disposal. More recent work has concentrated on the constructive side of the adaptationist project—assessing theoretical problems within the adaptationist framework and engaging in specific tasks of scholarship and interpretive criticism. This capacity to turn away from polemic and to engage in genuinely new and constructive work marks a fundamental difference between adaptationist literary study and the often merely negative, reactive responses against poststructuralism that characterize the critiques of many older, traditional scholars.

Hovering on the Verge of a Paradigm

Evolutionary psychology has already produced an immense body of useful research, and adaptationist literary study has now produced a much smaller but

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still substantial and valuable body of work. It nonetheless remains the case that we do not yet have a full and adequate conception of human nature. What we have are the elements that are necessary for constructing that conception. I shall list here a few questions that need to be answered before we can put these elements together in a way that makes good on our claims for possessing a science of human nature.

At what level do the analytic reductions of biology and psychology become distinct motives, with their attendant emotions? How firmly do we draw the line between the “ultimate” regulative principles of inclusive fitness or reproductive success and the “proximal” mechanisms that operate on the level of immediate triggers to behavior? Is reproduction itself a motive, or do people only want sex? (Sociobiologists emphasize reproductive success; evolutionary psychologists look at people as “adaptation executors.”) Do people desire children? Or is parenting a behavioral repertory activated only by the presence of children? (The answer to this question seems obvious to me; many people, though not all, actively want children, but many evolutionary psychologists would balk at that common observation.) Can human behavior be organized into whole “behavioral systems” like “mating” and “parenting,” or are all motives only localized mechanisms (“cognitive modules” or “domain-specific mechanisms”) triggered by specific stimuli? If behavior is in fact organized into coherent and integrated behavioral systems, what are these systems? How many are there? Is “technology” a separate system? Is “social life” a system or a complex set of systems? How much flexibility is built into any system? That is, how wide a range of possible response to contingent circumstance is possible within a given system? (Too wide, and it is no longer a system; it is drifting toward the infinite flexibility of cultural constructionist views of human behavior. Too narrow, and the systems are not specifically human at all; they are merely the forms of programmed behavior we associate with the less complex neural anatomy of “lower” organisms.)

Is cognition itself a behavioral system? Does cognition consist only of a discrete array of specialized cognitive modules, as Tooby and Cosmides would have it, or does it consist also of a certain range of “general intelligence” that mediates among modules, synthesizing them and bringing them into productive and creative interaction, as Steven Mithen argues? If, as I believe, cognition is itself a distinct behavioral system, on a par with those for “technology,” “mating,” “parenting,” and “social life,” that means that the mind itself has motives, that mental needs and processes are distinct and irreducible, with their own particular satisfactions and frustrations. Like all other motives, mental motives interact with the motives of other behavioral systems. People need to understand the world around them, and they thus construct religions, philosophies, sciences, and the arts. But they also need resources, sex, and status, so they use their cognitive activities, like all their other capacities, as means

for obtaining the “good things” in life (as Trollope calls them). The interaction of distinct motives should not blind us to the distinctness of the motives.

Within the last few years, since about 1999, evolutionary psychology has progressed to the textbook phase—that is, the phase of institutional success in which a burgeoning academic industry stimulates a proliferation of textbooks designed for use in introductory survey classes. These books range in quality from David Buss’s thorough and circumspect survey *Evolution: The New Science of the Mind* to works that could be fairly described as the dual offspring of amateur enthusiasm and commercial ambition. In one respect, the onset of the textbook phase is a good sign. It means that there is a large audience and that the field has won sufficient general respect to warrant official recognition in academic programs. In other respects, the textbook phenomenon is a cause for some concern, and even dismay. Until it has answered questions like those I have listed above, evolutionary psychology can make no valid claim to have achieved intellectual maturity. Textbooks tend to affirm incomplete and uncertain propositions as settled doctrines to be comfortably memorized and replayed on exam questions. One thinks of the old joke about America having passed from barbarism to decadence with no intervening period of civilization.

Despite the threat of premature ossification in textbooks, I am hopeful that serious scientists and scholars will continue to pursue the important questions about human nature that have been the subject of adaptationist study. Perpetual suspension is not the goal. The goal is valid synthesis. One way to measure the validity of any proposed synthesis will be to judge the degree to which that synthesis comprehends the adaptive functions of the human imagination. Literary scholars can do evolutionary psychologists an important service by keeping this criterion of success steadily in view.

The Adaptive Function of Literature and Other Arts

The adaptive function of literature and the other arts is still very much a live question among adaptationists. In “Narrative Theory and Function: Why Evolution Matters” (2001b), Sugiyama argues that narrative is a universal human disposition, that it develops reliably and spontaneously in all known cultures, no matter how isolated they might be, and that it takes the same basic form in all cultures—a form involving characters, goal-oriented action, and resolution. Sugiyama’s arguments for *why* narrative should be considered adaptive seem cogent to me. Her arguments for *how* narrative functions adaptively seem right as far as they go, but in my view they do not go as far as they should. She argues that narrative is primarily a means of conveying adaptively important information, and in this respect her arguments are congruent with those put forth by Steven Pinker in his encyclopedic expositions of evolutionary psychology, *How the Mind Works* (1997) and *The Blank Slate: The Modern Denial of Human Nature* (2002). Pinker argues that plot situations in narrative serve as models for behavior, that they are like game plans and that in this

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respect they are roughly parallel with the model chess games laid out in chess training books. Many authors have no doubt conceived of their work in this way. The epistolary novels of Samuel Richardson had their origin in the book of model letters he published as a guide to writers who were uncertain about the conventions of epistolary propriety. And Anthony Trollope regarded his novels as useful guides to young women involved in the interesting life choices surrounding courtship and marriage. But the didactic side of things clearly does not exhaust the interest and significance in the works of either of these authors, or of any author. I for one have made no use of Richardson's model letters, and as a married, middle-aged male, I am unlikely ever to find myself faced with the interesting life choices Trollope depicts, but I still find both these authors absorbing and stimulating.

In addition to the idea of information transmission or game-plan modeling, there are at least two other theories that have been proposed on the adaptive function of artistic constructs, including literature. (When we speak of literature in a context like this, we must always be understood to include the oral antecedents of written language—"literature" as it is practiced by peoples who are preliterate but who nonetheless have rich traditions of oral narrative.) One theory is that proposed by Geoffrey Miller in *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature* (2000), and the other is that proposed by E. O. Wilson in *Consilience: The Unity of Knowledge* (1998).

On the grounds that other primates get along fine without brains of human magnitude, Miller suggests that the higher cognitive capacities of the mind have no particular adaptive utility, at least so far as "survival" is concerned. As an alternative to the idea that the mind has survival value, Miller proposes that the mind evolved through sexual selection as a form of sexual display. The artifacts of the mind—conversation, art, music, literature, and so on—would be forms of display at one remove. Miller's argument against the survival value of the human brain is patently weak. An identical argument could be made about any adaptation not universally shared by all organisms. Many organisms get along fine without eyes, ears, legs, or wings, but few people would conclude from that observation that eyes, ears, legs, and wings contribute in no discernible way to the survival of any organism. Miller's argument against the survival value of the human brain reduces instantly and irresistibly to absurdity.

Miller makes his case for art as sexual display with a good deal of learning and wit, but his central thesis is almost comically far-fetched. In his single-minded pursuit of this one bright idea, he loses sight of a larger principle that undergirds all adaptationist thinking: the idea that complex functional structure gives evidence of adaptive design. Miller argues that all mental activity is a form of sexual ornamentation, and he suggests that "every sexual ornament in every sexually reproducing species could be viewed as a different style of waste" (p. 128). The complex functional structure of the mind thus becomes simply an efficient means of consuming adaptively expensive calories—a sort

of neurological incinerator. It is as if a group of workmen were to set up a workshop dedicated to fabricating fine musical instruments, and right next door also to set up a large furnace. All the instruments—oboes, cellos, pianos—are lovingly crafted with immense care and skill, and as soon as each is produced, it is carried over to the furnace and tossed in. Admiring but congenitally tone-deaf females observe this display, marvel at the ostentatious expenditure of superfluous effort, and go soft and warm with sexual excitation. The workmen clearly possess resources so abundant that they can devote the larger part of their productive life to an elaborately senseless process designed to generate highly structured forms of pointless activity.

The functional hypothesis put forth by Sugiyama and Pinker is sensible but incomplete, and the hypothesis put forth by Miller is provocative but ultimately frivolous. The two arguments nonetheless display a common weakness. Neither of them identifies any adaptive function that is specific to art or literature proper. In both hypotheses, literature is a means to an end, in the one case a means for conveying practical information, and in the other a means for generating sexually attractive forms of wasted effort. In the degree to which artistic and literary productions are themselves highly organized in ways that seem designed to fulfill a primary and irreducible psychological need, these functional hypotheses fail to account for the subject at hand. People everywhere have a spontaneous and irrepressible disposition for producing and consuming narratives. Neither the theory of information exchange nor the theory of sexual display offers a convincing explanation for why they have any such need.

In his chapter on the arts in *Consilience*, E. O. Wilson offers a convincing adaptive hypothesis for the universal human disposition to create and consume imaginative artifacts. He argues that the large human brain has adaptive (survival) value, but that in solving some adaptive problems the brain produces a new adaptive problem—it causes confusion and uncertainty. The human brain allows for an unparalleled flexibility of response to variable environmental conditions, but to achieve this flexibility it must cut human cognition loose from any rigidly programmed set of instinctual behaviors. In a dangerous and challenging world that demands decisive action oriented to adaptively functional goals, confusion and uncertainty are potentially fatal disabilities. It is in order to cope with this challenge, Wilson argues, that human beings have created religion and the arts:

There was not enough time for human heredity to cope with the vastness of new contingent possibilities revealed by high intelligence. . . . The arts filled the gap. Early humans invented them in an attempt to express and control through magic the abundance of the environment, the power of solidarity, and other forces in their lives that mattered most to survival and reproduction. The arts were the means by which these forces could be ritualized and expressed in a new, simulated reality. They drew consistency from their faithfulness to human nature, to the emotion-guided epigenetic rules—the algorithms—of mental development. (p. 225).

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Within this general hypothesis, we can formulate more specific hypotheses about the way in which literature and the other arts organize experience in subjectively meaningful ways. We can argue that the arts are indispensable for personal development, for the coherent internal organization of ideas and feelings, and for the organization of shared experience that makes collective cultural life possible. As cognitive paleoanthropologist Steven Mithen observes, imaginative artifacts are not “simply products or representations of our inner thoughts. They play an essential role in formulating, manipulating and sharing those thoughts” (2001, p. 50). In art, music, and literature, people make the forms of experience available to their own conscious minds and to those of others.

When we speak of the literary or artistic “imagination,” we mean to signify the complex, integrated set of cognitive, perceptual, and emotional faculties through which we articulate and communicate the felt quality of life. Imaginative constructs are both organized in conceptually intelligible patterns and also weighted with qualitative, subjective affects. The arts make a psychologically indispensable link between conceptual models of experience and the biologically constrained and emotionally mediated dispositions that in common usage we call “human nature.” Evolutionary psychologists follow that common usage, and for understandable reasons they are preoccupied with affirming the continuity between human nature and the nature we share with other primates and, in decreasing degrees, with all other animals and all living things. This preoccupation has a sound theoretical basis, and it has proved immensely fruitful for the purpose of analyzing the biological basis of human behavior; but acknowledging the continuity of animal and human nature does not require us to overlook the fact that the arts are themselves one of the most salient and functionally important parts of our specifically *human* nature.

Art provides an emotionally and subjectively intelligible model of reality, and it is within such models that human beings organize their complex behaviors in flexible response to contingent circumstances. The imaginative models that we construct about our experience in the world do not merely convey practical information. They direct our behavior by entering into our motivational system at its very roots—our feelings, our ideas, and our values. We use imaginative models to make sense of the world, not just to “understand” it abstractly but to feel and perceive our own place in it—to see it from the inside out. Making sense of the world in this way, through narrative and through the other arts, is both a primary psychological need and a necessary precondition for organizing our behavior in ways that satisfy all our other adaptive needs. (For arguments to this effect, see Dissanayake, 1995a, 1995b, 2000, 2001, in press; Storey 1996; and in this vol., see part 1, chapters 6 and 7; part 2, chapters 1 and 6.)

The Essays in this Volume

All but three of the essays collected here have appeared previously. Some were published as articles and some as reviews, but the line between the two genres

is broad and fuzzy. All of the articles include commentary on current contributions to adaptationist study, and all of the reviews include overt theoretical formulations.

The essays are grouped in three general categories: (1) discussions about the relations among different schools or theoretical perspectives; (2) essays in Darwinian literary theory and practical criticism; and (3) scholarship on Darwin. In each section, the essays are arranged roughly in the order of their composition. The distinction between the first two categories, like that between articles and reviews, is fuzzy. All the essays that are mainly reviews have been placed in the first section, but two of the essays in the first section also contain practical criticism on Victorian novels ("Pinker, Dickens, and the Functions of Criticism," and "Ecocriticism, Cognitive Ethology, and the Environments of Victorian Fiction"). I have placed them in the first section because my primary purpose in these two essays is to assess other theorists or schools of theory. In an essay in the second section, "Organism, Environment, and Literature," I also discuss ecocriticism, but my main purpose there is to trace the development of my own thinking about literary theory over a period of two decades. Similarly, in "The Deep Structure of Literary Representations," I take issue with the cognitive rhetoricians, but I use them only as a foil, and my main purpose is to integrate evolutionary psychology with literary analysis. So that essay too has been placed in the second section.

The essays in the first section, "Mapping the Disciplinary Landscape," delineate historical trends and large party groupings among literary critics and theorists. "The Use of Arnold in a Darwinian World" reflects on the adjustments we have to make when we pass from Arnold's enlightened but prescientific humanism to the Darwinian worldview. "Biology and Poststructuralism" was abstracted from *Evolution and Literary Theory* (1995) and incorporates three main components of that book: the attack on poststructuralism, the formulation of general biological principles that could serve as a new foundation for literary study, and the exposition of a theory of literary figuration. "'Theory,' Anti-Theory, and Empirical Criticism" provides an overview of three main areas in the current disciplinary landscape: (a) the postmodern establishment, (b) the traditional humanist reaction against that establishment, and (c) the newly emerging adaptationist perspective. The review of John Ellis's *Literature Lost* offers a close look at a prime example of the traditional humanist reaction. In the middle of the 1990s, adaptationist study was still a fairly rudimentary enterprise. The lay of the land at that time can be discerned in "Literary Study and Evolutionary Theory: A Review of Books by Alexander Argyros, Walter Koch, Karl Kroeber, Robert Storey, Frederick Turner, and Mark Turner." All six books discussed there claim some affiliation with evolutionary theory, but only one, Robert Storey's *Mimesis and the Human Animal*, could be characterized as adaptationist. The others are instances either of "cosmic evolutionism" or of "cognitive rhetoric." The essays on Steven Pinker and

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E. O. Wilson focus on their efforts to provide Darwinian explanations for the functions of literature. Several essays in the second section also discuss the adaptive functions of literature.

In the second section, the first and last essays (chapters 1 and 6) contain comprehensive, synthetic accounts of Darwinian literary theory. The first was written in 1998, the second in 2003. The four middle essays constitute two paired sets. "Universals in Literary Study" can be regarded as a theoretical prelude for the study of human universals in the five novels discussed in "Human Universals and Literary Meaning: A Sociobiological Critique of *Pride and Prejudice*, *Villette*, *O Pioneers!*, *Anna of the Five Towns*, and *Tess of the d'Urbervilles*. "Organism, Environment, and Literature" can be regarded as a theoretical prelude for the appeal to ecological integrity as a criterion of literary value in the subsequent discussion of three novels about Paleolithic life. The last essay in this section sets out a model for human nature, identifies the main elements of literary meaning, and offers a commentary on *Pride and Prejudice* to illustrate the way these ideas enter into practical criticism.

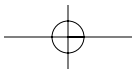
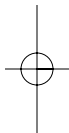
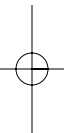
The third section, "Darwin and Darwinism," contains a short review of three biographies of Darwin and a longer commentary on Stephen Jay Gould. Only one of the three biographies (Bowlby's) is itself thoroughly Darwinian in character, and comparing the three Darwin biographies provides an occasion for reflecting on the problems of point of view and interpretive framework in biographical and historical study. The critique of Gould takes up the story of modern evolutionary theory from where I left off in my introduction to an edition of Darwin's *On the Origin of Species* (2003). There, I had carried the story up to the consolidation of Darwin's theory in the "Modern Synthesis"—the integration of genetics with the theory of natural selection—in the 1930s and 1940s. The Modern Synthesis remains the standard framework for the modern, scientific understanding of evolution. In essays published over the past three decades, Gould established himself as the chief opponent of the Modern Synthesis and sought to disconnect Darwinism from the idea of adaptation. Taking account of Gould's work gives me an opportunity to assess the enduring cogency of adaptationist theory. Gould's methods of sophisticated argumentation bear a close resemblance to the methods employed by the postmodernists who were the chief targets of polemical animus in *Evolution and Literary Theory*. The critique of Gould thus brings the study of Darwinism into close connection with the commentaries on contemporary critical theory.

The three essays that are here published for the first time are "Adaptationist Criteria of Literary Value: Assessing Kurtén's *Dance of the Tiger*, Auel's *The Clan of the Cave Bear*, and Golding's *The Inheritors*," "Human Nature and Literary Meaning: A Theoretical Model Illustrated with a Critique of *Pride and Prejudice*," and "Modern Darwinism and the Pseudo-Revolutions of Stephen Jay Gould." All the other essays have been published over the past decade. Most of the previously published essays have been retouched but not sub-

stantially altered. Some of the titles have been modified for the sake of clarity and specificity. (The original titles and places of publication are identified in the acknowledgements.) In the previously published version of “Ecocriticism, Cognitive Ethology, and the Environments of Victorian Fiction,” two paragraphs, one on Austen and one on Hardy, were deleted for reasons of length. Those two paragraphs have here been restored. In the article giving a sociobiological reading of five novels (part 2, chapter 3), the section on Bennett’s *Anna of the Five Towns* has been substantially reworked. “Universals in Literary Study” was originally published in a German translation and is here presented in the original English.

Many of the references have been abbreviated, expanded, or brought up to date. All original endnotes or footnotes have been incorporated into the text either as part of the text itself or as parenthetical citations. The style of reference is that of the social sciences, with publications identified parenthetically by author and year of publication. Multiple publications by the same author are listed chronologically in the references, and multiple publications by the same author within a single year are distinguished by lowercase letters following the year. For example: See Cooke, 1995, 1999a, 1999b, 1999c; Easterlin, 2001a, 2001b.

Many friends and colleagues have contributed through discussion or direct criticism to the essays collected here. Particular mention should be made of John Alcock, Larry Arnhart, Brian Boyd, Donald Brown, Napoleon Chagnon, Richard Cook, Brett Cooke, Ellen Dissanayake, Denis Dutton, Nancy Easterlin, David Evans, Harold Fromm, Glen Love, Jonathan Gottschall, Ian Jobling, Kevin MacDonald, Clinton MacHann, Robert Storey, Michelle Sugiyama, and David Sloan Wilson. Harold Fromm first suggested the idea of a collection and has offered shrewd advice and generous help all along the way.



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- The introduction was adapted from "Adaptationist Literary Study: An Emerging Research Program," *Style* 36 (2003): 596–617.
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