Toward a Consilient Study of Literature

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Philosophy and Literature, Volume 31, Number 1, April 2007, pp. 162-178 (Review)

Published by Johns Hopkins University Press
DOI: *https://doi.org/10.1353/phl.2007.0016*

Critical Discussions

TOWARD A CONSILIENT STUDY OF LITERATURE

by Steven Pinker

People tell stories. All over the world, and probably for as long as they have existed, people invent characters and recount their fictitious exploits. This apparent frivolity is no small matter in human affairs. If one were to tally the number of hours and resources spent in enjoying fiction in all its forms—story-telling, pretend play, myths and legends, fairy tales, novels, short stories, epic poems, television, movies, theater, opera, ballads, narrative paintings, jokes, comics, skits, video games, and pornography—it would surely account for a major portion of people's time and a major portion of modern economic activity. Considering the costs in time, foregone opportunities to engage in practical pursuits, and the dangers of confusing fantasy with reality, our longing to lose ourselves in fiction is a big puzzle for anyone seeking to understand human beings. All the more so from a Darwinian perspective, as one might have expected natural selection to have weeded out any inclination to engage in imaginary worlds rather than the real one.

Fiction is important not only in the lives of everyday people but in intellectual life. An acquaintance with major works of fiction has long been considered essential to being an educated person, and it is probably a more common university requirement than patently useful subjects like biology or statistics. Departments of English (and other

The Literary Animal: Evolution and the Nature of Narrative, edited by Jonathan Gottschall and David Sloan Wilson; xxvi & 304 pp. Evanston: Northwestern University Press, 2005, $79.95, $29.95 paper.

Philosophy and Literature, © 2007, 31: 162–178

literatures) are often the most star-studded and prominent divisions of modern colleges and universities, and disproportionate attention has been given to debates over the content of their curricula. And despite having had several centuries to get it right, the study of literature in modern universities strikes many observers (insiders and outsiders alike) as being in, shall we say, critical condition—politicized, sclerotic, and lacking a progressive agenda.[1]

The Literary Animal: Evolution and the Nature of Narrative tackles both conundra and calls for a new body of research to address it—the evolutionary analysis of fiction, or Darwinian Lit-Crit. There are many reasons to believe that connecting literary analysis with evolutionary psychology is an idea whose time has come. One of the biggest contributions of evolutionary psychology, regardless of which of its theories one accepts, is to have created new fields of study for aspects of mental life that preoccupy human beings but that had been almost entirely neglected by academic psychology—topics like beauty, love, status, food, sex, religion, war, exchange, morality, music, art, and, as we shall see, fiction. The fact that many of these preoccupations seem to lack any biological utility only makes them more intriguing as scientific puzzles. And it frames a family of empirical hypotheses, namely whether each of these faculties is an adaptation (a product of Darwinian natural selection), a by-product of adaptations (sometimes called "spandrels"), or the result of genetic drift or other random evolutionary processes. Fiction in particular offers a precious gift to evolutionary psychology: the people and events on display in fictive worlds presumably reflect our species' obsessions, and provide an ecologically valid source of data about what matters to us.

For its part, literary analysis would surely benefit from the latest scientific ideas on human thought, emotion, and social relations. Fiction has long been thought of as a means of exploring human nature, and the current stagnation of literary scholarship can be attributed, in part, to its denial of that truism. The field's commitment to the dogma that the mind is a blank slate and that all human concerns are social constructions has led it to focus on cultural and historical particulars, banishing the deeper resonances of fiction that transcend time and place.[2] And its distrust of science (and more generally, the search for testable hypotheses and cumulative objective knowledge) has left it, according to many accounts, mired in faddism, obscurantism, and parochialism. For all these reasons, evolutionary psychology and literary analysis seem to be natural companions.

The Literary Animal is a manifesto for forging this connection, and a collection of proofs of concept. The essays, all original, are pleasantly well-written for an academic collection; the writing is consistently clear, and often stylish. The essays present new ideas and findings—from biology, literary analysis, history, and quantitative surveys, among other fields—that will enlighten anyone interested in literature or the human animal. And as one would expect from a new and ambitious field, there are some false starts, and much left to be done.

The book opens with encouragement from three distinguished godfathers. From biology, E. O. Wilson heralds Darwinian lit-crit as a fulfillment of his idea of consilience, or the unification of knowledge. Consilience has long been enjoyed by the sciences, has recently extended to the social sciences with the help of evolutionary psychology and cognitive neuroscience, and is now ripe for extension to the humanities and arts. From literary criticism, Frederick Crews applauds the analytic and empirical mindset of the new field, with the reservation (which I share) that evolution is just one of a number of human sciences that will be needed to achieve a consilient literary scholarship. From fiction writing, Ian MacEwan celebrates the universal human nature that allows great literature to be appreciated thousands of miles and thousands of years from its origin. All three essays are delightful.

The godfathers deplore the current state of academic literary analysis, and more bad news may be found in the introduction by the editors (Jonathan Gottschall, an English scholar and evolutionary psychologist, and David Sloan Wilson, an evolutionary biologist), and in a memoir by the psychoanalyst and science writer Dylan Evans. Gottschall recounts the idiotic resistance he encountered when proposing his dissertation work on the evolutionary logic behind characters' motives in the *Iliad*—he was told that this was a form of racism and Nazism, and that he was permitted to invoke Freud and Lacan in his work but not Darwin. (He eventually recruited D. S. Wilson and other extra-departmental faculty as his advisors.) The resistance continued with this book itself, which was rejected by one academic publisher after another before finding a home at Northwestern University Press. Evans narrates his gradual disenchantment with the Lacanian psychoanalysis which he was trained in, and which, together with deconstruction and other flavors of "Theory" (feminist, postcolonialist, queer, etc.) now dominate many literature departments. Three other contributors (the literary critics Joseph Carroll and Brian Boyd, and the philosopher Denis Dutton), have sounded similar alarms elsewhere.[3] Dutton provides this volume with an Afterword

that reinforces the value of a consilient scholarship for the arts and briefly introduces some of his own ideas about the evolutionary basis of visual aesthetics.

Two of the essays try to lay out theories of human nature that can then be put to use in analyzing fiction. Both authors deserve enormous credit for the birth of evolutionary lit-crit; D. S. Wilson for rescuing Gottschall and coediting this volume, Carroll for his monumental 1995 book *Evolution and Literary Theory*, which pretty much invented the field more than a decade ago. But possibly because neither is a psychologist, I found their attempts at psychological theory to be the most disappointing parts of this book.

Wilson aims at a "middle ground" of "evolutionary social constructivism" in which a process of cultural evolution would parallel the familiar biological kind. I found the discussion unilluminating for two reasons. One is that his foil, the extreme evolutionist who denies the existence of culture, is a figment of the imagination: a straw man for polemicists to knock down, or a sacrificial lamb for self-described moderates claiming the middle ground. The other problem is that the superannuated idea of culture evolving by a counterpart to biological evolution has turned out to be sterile at best and probably wrong. Wilson invokes (but does not cite) Richard Dawkins's version of this idea, the theory of memes, in which stories (and other bits of culture) are inherited, mutated, and selected like genes. But the theory (which Dawkins himself is more cautious about) has led to few interesting discoveries in the thirty years since *The Selfish Gene* was published; nor have we learned much from the looser analogies between biological and cultural evolution that have been bruited for decades. As a number of evolutionary psychologists have pointed out, if "cultural evolution" means anything more precise than the co-opting of the word "evolution" to mean "historical change," the analogy is seriously misleading.[4] Ideas, unlike genes, are not copied across generations with high fidelity, and they don't mutate by blind, random processes. Rather, they are crafted by a ten-trillion-synapse human brain, guided by its anticipation of how the stories will affect the similarly complex brains of readers or listeners. The analogy of cultural change as to biological evolution leaves the human mind out of the picture entirely. To use an apposite cliché, this is like *Hamlet* without the Prince of Denmark.

Carroll, in contrast, does offer a theory of how the mind works, in the form of a set of "cognitive behavioral systems" (what others might call modules). But his divisions strike me as arbitrary and unmotivated. For

instance, "survival," "technology" and "cognitive activity" are each put in a separate box, despite being heterogeneous categories with enormous overlap. And they are inexplicably lined up with the emotions "fear," "joy," and "surprise," respectively. The chapter also thunders against the pioneers of evolutionary psychology John Tooby and Leda Cosmides for downplaying the notion of general intelligence, and of individual and racial differences.[5] This, too, struck me as gratuitous. General intelligence is a dimension of variation among individuals (like "strength" or "health"), not a mechanism, so it is unhelpful as an explanation of how people think and feel. Tooby and Cosmides are skeptical about qualitative differences among individuals' minds, but they certainly acknowledge quantitative ones (some people are quicker to anger than others, but no one lacks the emotion of anger altogether), and Carroll offers no reason to believe otherwise. Nor is it clear why he feels that evolutionary literary criticism should avail itself of J. Phillippe Rushton's unusual and blazingly controversial theories about genetic differences in personality and intelligence between Europeans, Africans, and Asians.

Fortunately, Carroll's polemical preliminaries soon give way to the heart of the chapter, an application of his views on evolutionary literary criticism to *Pride and Prejudice*. Carroll's approach defies simple summary, but a key idea is that authors implicitly appeal to a universal human nature—not as a set of laws that determine how characters act, but as a frame of reference within which observers find meaning in their own and others' actions. In any work of fiction, there are three kinds of observers trying to do this: the author, the characters, and the reader. From their distinct vantage points, each may interpret a character's acts in a different way, and a skillful author exploits the tension among these perspectives as the story unfolds and information about character and motives is withheld, revealed, and deliberated. In *Pride and Prejudice,* the operative feature of human nature is the psychology of mate choice, particularly the different weightings that men and women give to youth and beauty on the one hand and to status, wealth, stability, and ambition on the other. Austin, her protagonists, and her readers struggle to reconcile these impulses, which direct our passions toward people's superficial qualities, with more reflective faculties, which assess people's quality of mind and morals.

Carroll dissects the novel with skill and verve, and will make many readers wish that they had had him as their college English prof. Nonetheless, one is left wondering how essential the evolutionary biology is to his insights. The mating criteria that obsess the Bennett women may

reflect universal impulses, but the specifics of the novel depends on the way that these impulses were exaggerated and codified in their time and culture. Today, a depiction of a contemporary middle-class family that worried aloud about finding wealthy husbands for the daughters, and about their being disgraced by a daughter running off with the son of a steward, would elicit guffaws, not a flash of recognition. In *Pride and Prejudice*, to be sure, these worries are set in tension with other concerns, but a skeptic could say that the tension is between individual and cultural demands, not individual and evolutionary ones. Evolutionary impulses may be more acutely delineated, and thus more indispensable to literary analyses, in stories set in a culture whose values work *against* them, rather than in a culture whose values are redundant with them or an exaggeration of them. In other words, Darwin may be more important in explaining the ambivalent appeal of wealthy suitors in *Sex and the City* than in *Pride and Prejudice*. The question of whether evolutionary lit-crit is better suited to low culture or high culture is rarely mentioned in *The Literary Animal* (or in the psychology of the arts in general); I will return to it later.

Three other essays examine genres of fiction that are also built around human motives that may be illuminated by evolution. The anthropologist Robin Fox suggests that epics and romances (like *Gilgamesh, Beowulf,* the *Iliad*, *Le Morte d'Arthur*, and *Chanson de Rolande*) explore the tension between male bonding, which unites men in aggressive coalitions, and emotional ties to their lovers, wives, and families. The common thread that runs across widely separated cultures and millennia is eye-opening, and it counters skepticism that any one of these works is only exploring the contingent values of a particular society.

The literature scholar Marcus Nordlund defends the reality of romantic love as a universal human emotion in the teeth of the dogma among literary intellectuals that it is a late social construction. From there he insightfully examines some of the most appealing characters in fiction: the women in Shakespeare's romantic comedies. Nordlund suggests that they are depicted in the phase of life (at least in Elizabethan and similar cultures) in which women were given freest rein to exercise their faculties of choice and discernment of human character, and in which some of the contradictions of human nature are most flagrantly on display, namely during courtship.

The evolutionary psychologist Catherine Salmon, resisting the pull among academics toward examining high culture, contrasts the visual pornography consumed by men with the romance novels consumed by

women. (The latter includes the bizarre subgenre of "slash fiction," which has nothing to do with chainsaw-wielding maniacs but rather consists of amateur stories about romantic couplings between pop-culture male duos like "Kirk/Spock" and "Starsky/Hutch.") These private pleasures indulge, and hence illuminate, men's and women's differing sexual tastes, with the men indulging in simulations of no-strings sex with nubile bodies and the women indulging in simulations of deep relationships with whole people. As Salmon and her former collaborator Donald Symons have put it, "To encounter erotica designed to appeal to the other sex is to gaze into the psychological abyss that separates the sexes."

The essence of science is not a subject matter or a set of experimental techniques, but the conviction that our claims about the world are not matters of personal taste or conviction but can be evaluated for their degree of truth. A consilient literary analysis should thus pursue some of the methods of science as well as its theories, and two of the contributions argue that hypotheses in literary scholarship can be as testable as those in the sciences.

Gottschall examines the common claim from feminist theory that "European fairy tales reflect and perpetuate the arbitrary gender norms of western patriarchal societies," a corollary of its tenet that gender is a social construction in its entirety. Using a sample of 658 folk tales from diverse societies, and a variety of safeguards against bias, he shows that the incriminating features of European fairy tales—active and heroic male protagonists, young beautiful female protagonists, older female antagonists—are in fact found in the folk tales of every culture. Like the other contributors, Gottschall interprets the resonance of these sex differences in terms of Darwin's theory of sexual selection as elaborated by Robert Trivers.[6] The sex with the greater minimal investment in offspring is selected to be more choosy; the sex with the lesser investment is selected to be more promiscuous and competitive. In the human species, our mammalian physiology makes women the greater-investing sex, though the fact that our males also invest in their offspring blunts the asymmetry, and makes both sexes compete and choose, though using different criteria: fertility for men choosing women, ability and willingness to invest for women choosing men. Gottschall was surprised to find that an emphasis on finding a suitable marriage partner, unlike the other traits, was associated with male and female characters in equal proportions, but I was not surprised. David Buss's surveys on sex differences in mating (which several of the contributors cite) shows that men and women report an equally strong desire to get married.[7] This

isn't, of course, incompatible with the finding that men have a greater desire for casual sex partners before marriage and after, and is partly explained by the way that marriage can assuage male sexual jealousy (itself presumably an adaptation against the evolutionary disaster of cuckoldry). Marriage is a double-edged bargain: you can't sleep around with other partners (or at least you shouldn't get caught), but then your spouse can't sleep around with other partners either.

Trivers's predictions about the optimal mating strategies of each sex have now been subdivided into strategies for long-term and for short-term liaisons, which in the case of women's mate preferences can diverge substantially (see Buss, 1994). When it comes to short-term affairs, women should prefer fit, dominant men, who can provide any offspring with good genes; when it comes to long-term relationships, they should prefer nurturing, well-heeled men, who can provide their offspring with care and resources (the two ideals are sometimes called cads and dads). The psychologists Daniel Kruger and Maryanne Fisher, together with the literature scholar Ian Jobling, propose that the two kinds of men are the archetypes for the two kinds of hero long recognized in British romantic fiction: the "proper hero" (a sensitive, decent mensch) and the "dark hero" (a dominant, dashing outlaw). The women in their study, as predicted, reported that they would prefer to hook up sexually with the dark heroes, but that they liked the proper heroes more, and would prefer them as long-term partners, husbands, and sons-in-law.

The throbbing question about fiction from an evolutionary viewpoint is what, if anything, it is for. I believe that most people misunderstand the question, and in *How the Mind Works* I tried to clarify it. Having been embroiled in scores of discussions on the topic since then, I've found that almost everyone connected with the arts (including music, literature, and painting) believes that it is important to show that art is an adaptation, that there is good evidence that art is an adaptation, and that the function of art is some version of bringing the community together. I think all three beliefs are false, and that ultimately they may damage this nascent field. A glib acceptance of them could embolden the many critics who would love to strangle this discipline in its cradle, using the clichéd criticism of evolutionary theories, namely that they are a bunch of after-the-fact just-so stories. Only in this case, the critics would be right.

I sense that most people involved with the arts want them to be an adaptation because they feel it would somehow validate or ennoble the arts—perhaps even protect them against budget-conscious politicians

seeking to cut them from school curricula. Part of the problem is an ambiguity in the word itself. In the common vernacular, "adaptive" is a good thing; it means "healthy, clever, well-adjusted." In the biologist's technical sense, though, it refers only to a trait that evolved because, compared to alternative versions of the traits, it increased the rate of reproduction of an organism's ancestors. Biological adaptations need not be praiseworthy by human standards. Quite the contrary. As Symons has pointed out, a willingness to commit genocide may very well be an adaptation, whereas the ability to read almost certainly is not. The arts could be evolutionary by-products, and be among the most valuable human activities for all that.

To demonstrate that X is an adaptation, one can't simply show that people like doing X, or that good things happen when people do X. This is circular; a restatement of the fact that people tend to do X. Instead, one has to show—*independently of anything we know about the human behavior in question*—that X, by its intrinsic design, is capable of causing a reproduction-enhancing outcome in an environment like the one in which humans evolved. This analysis can't be a kind of psychology; it must be a kind of engineering—an attempt to lay down the design specs of a system that can accomplish a goal (specifically, a subgoal of reproduction) in a particular world (specifically, the ancestral environment). With these design specs in hand, one can then compare the specs against the facts of the human drive or talent we are trying to explain. The closer the design specs match the empirical facts about human beings, the more confidence we have that the trait in question is an adaptation.

Example: Why do people crave sweets? Bad answers: because sweets give people pleasure; because eating sweets makes them feel satisfied; because eating sweets communally (at birthday parties, dates, and so on) brings people together. Better answer: because sugars contain accessible energy (a fact of chemistry), because the fruits of certain plants are rich in sugar (a fact of botany), because primates evolved in ecosystems with fruit-rich plants (a fact of paleoecology). Ergo, a drive to find and consume sweets would have provided an ancestral organism with energy, which is a prerequisite to reproduction. With other putative adaptations, different fields might provide the relevant engineering analysis: robotics for motor control, reproductive biology for sexual drives, Mendelian genetics for kinship emotions, game theory for cooperation and competition.

What about the arts? We can immediately see that any supposed

function that appeals only to the effects we observe post hoc in people won't cut it. Perhaps singing lullabies soothes babies; perhaps dancing relieves tension; perhaps shared stories bond the community. The question is, why would anyone have predicted, a priori, that people would be constituted in such a way that these things would happen? What exactly is it about a sequence of tones in certain rhythmic and harmonic relations that would lead a baby to ease up on its demands for parental attention (compared to any other signal), and what's in it for the baby? In the case of fiction, why should communally recounted falsehoods about characters and events that never existed make people any more attached to one another than they would otherwise find it in their interests to be? It's not that these questions are necessarily unanswerable, but they do need answers, and the answers cannot simply repeat what we already know about people's tendency to produce and consume works of art.

Appealing to this logic, I proposed that many of the arts may have no adaptive function at all. They may be by-products of two other traits: motivational systems that give us pleasure when we experience signals that correlate with adaptive outcomes (safety, sex, esteem, information-rich environments), and the technological know-how to create purified and concentrated doses of these signals (such as landscape paintings, erotica, or hero stories). Fiction may be, at least in part, a pleasure technology, a co-opting of language and imagery as a virtual reality device which allows a reader to enjoy pleasant hallucinations like exploring interesting territories, conquering enemies, hobnobbing with powerful people, and winning attractive mates. Fiction, moreover, can tickle people's fancies without even having to project them into a thrilling vicarious experience. There are good reasons for people (or any competitive social agent) to crave gossip, which is a kind of due diligence on possible allies and enemies. Fiction, with its omniscient narrator disclosing the foibles of interesting virtual people, can be a form of simulated gossip.

Unlike other art forms, I think that fiction lends itself to at least a prima facie case that it is also an adaptation. I mentioned that a true adaptationist hypothesis needs an engineering analysis to provide it with a source of a priori predictions—in effect, reasons why a designer would want to build the trait into a robot (or other artificial life form) that had to survive and reproduce in a humanlike ecosystem. I was impressed, then, by an essay by the artificial intelligence researcher Jerry Hobbs that began with the question, "Will robots ever have literature?"[8]

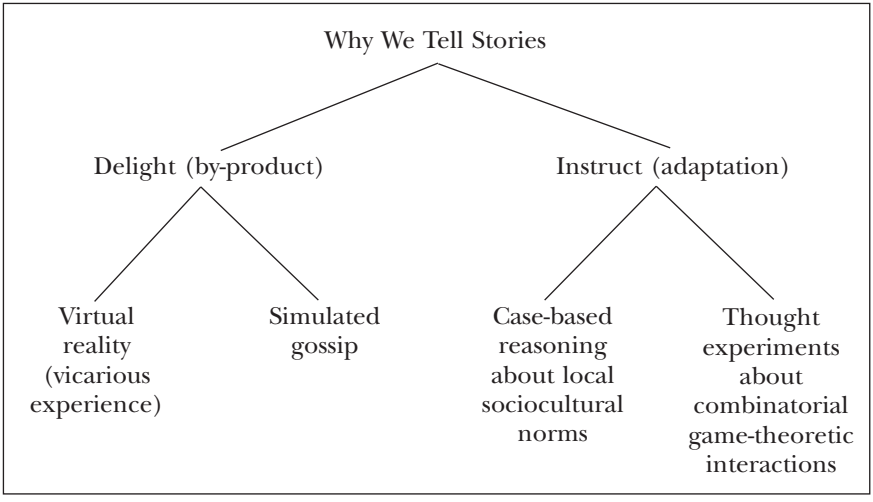
Hobbs argued that they might. Intelligent systems often best reason by experiment, real or simulated: they set up a situation whose outcome they cannot predict beforehand, let it unfold according to fixed causal laws, observe the results, and file away a generalization about how what becomes of such entities in such situations. Fiction, then, would be a kind of thought experiment, in which agents are allowed to play out plausible interactions in a more-or-less lawful virtual world, and an audience can take mental notes of the results. Human social life would be a ripe domain for this experiment-driven learning because the combinatorial possibilities in which their goals may coincide and conflict (cooperating or defecting in prisoner's dilemmas, seeking long-term or short-term mating opportunities, apportioning resources among offspring) are so staggeringly vast as to preclude strategies for success in life being either built-in innately or learnable from one's own limited personal experience. Since they are products of the imagination, fictitious plots are cheap and abundant, and can sample large regions of the space of important human interactions. Whether or not they have ever taken place among real humans is immaterial to their instructive value, as long as they preserve some degree of fidelity to the causal structure of the real world. An analogy would be the way that experts in chess (another domain with a combinatorial explosion of possible interactions) study transcripts of thousands of actual games rather than simply memorizing generic strategies like "get your queen out early."

The point can be broadened. Generic strategies for success are as useless in life as they are in chess (Buy low, sell high; He who hesitates is lost; Look before you leap; and so on). The problem with these maxims is that in applying them to real situations, the devil is in the details. Some artificial intelligence researchers believe that usable information about the world is often best stored and accessed in highly concrete scenarios. An entire configuration of relevant details is spelled out and recorded in memory, and the reasoner, when faced with a new scenario, searches in memory for the stored case whose constellation of details is most similar to the current one.[9] This is called "case-based reasoning," and it motivates the idea that humans might cognitively profit by observing plausible scenarios through fiction. It could be useful even in relatively simple cases that don't involve intricate plots exemplifying higher-order combinatorial interactions. If so, this would give an independent computational motivation for the frequent suggestion that fiction often serves a didactic function, implicitly teaching readers the rules of their social and cultural milieu.

The idea that fiction is both an adaptation and a by-product is not new; it is implicit in the old saying that the purpose of literature is "to delight and instruct." Putting together the various suggestions leads to the picture at the bottom of the page.

This taxonomy, needless to say, leaves many questions unanswered, but I think it organizes the viable hypotheses (not mutually exclusive) about the biological function of fiction. And it helps introduce the three remaining essays, each of which explores the evolutionary function of fiction.

The literary scholar and Nabokov expert Brian Boyd presents an incisive overview and critique of evolutionary theories of art (including mine) and a defense of his own favorite: that art is no by-product, but has the dual function of fostering social cohesion (an idea he credits to the scholar Ellen Dissanayake) and of engaging attention. Boyd rightly criticizes an alternative theory of the function of the arts from the psychologist Geoffrey Miller in which art is a costly signal of the neural fitness of the artist, a kind of cognitive peacock's tale.[10] Boyd points out that this theory falsely predicts that art should be produced and consumed primarily in the context of courtship. I agree with the criticism, though it must be said that Miller's theory at least passes the test of being a logically coherent, noncircular adaptationist hypothesis. The same cannot be said for the social-cohesion theory, because we have been given no a priori reason to predict that the sharing of imaginary events would be an efficacious way for the members of a



social species to stay together (compared to drawing circles in the air, reciting prime numbers, banging elbows, and so on)—other than that we know that our species seems to do it that way. (To say nothing of the issues papered over by the assumption that "social cohesion" is an evolutionary desideratum, a problem I will return to.) A similar problem faces the suggestion that shared attention is the evolutionary function of fiction. It begs the question of what's so adaptive about sharing attention, particularly attention to events that never happened, other than that people like to do it.

The remaining two essays more or less make the case for the "delight" and "instruct" theories, respectively. The psychology lecturer and former playwright and actor Daniel Nettle argues for the simulated-gossip theory (using metaphors like recreational drugs and the ethologist's "supernormal stimulus"), pointing to the intensively social nature of Homo sapiens and the intrigues it embroils us in. This is a backdrop to his concise yet rich analysis of drama (particularly the plays of Shakespeare), which includes a helpful 2 X 2 taxonomy of its major forms: Conflicts of Status versus Mating, crossed with Positive versus Negative Resolutions for the protagonist (a tragedy is a Conflict of Status with a Negative Outcome, a heroic drama involves Status Conflict with a Positive Outcome, a love tragedy involves Mating Conflict with a Negative Outcome, and a Comedy involves Mating Conflict with a Positive Outcome.

The literature scholar Michele Scalise Sugiyama emphasizes the "instruct" function, pointing to the ways in which fiction allows audiences to acquire information, rehearse strategies, and refine skills relevant to resolving human goals in conflict. She is the only contributor who systematically brings research in cognitive science to the table, including story grammars (the rules of narrative structure) and theory of mind (the way people think as intuitive psychologists). And remarkably, she is the only contributor to point out that the medium of literature is language (most of the theories in the book would apply perfectly well to movies or television). For that reason, she notes, an analysis of linguistic processes is also essential to a full understanding of the psychology of fiction.

So what are the prospects for a new, consilient field of literary scholarship? *The Literary Animal*, of course, is meant to inaugurate the field and show its promise; it can't be a showcase of mature work. But as rich and insightful as the essays in *The Literary Animal* are (I've hardly done them justice), they left me feeling that the promissory foundations of the field need some more thinking through. Here is my unsolicited

advice for some of the things that Darwinian lit-crit must do before it is ready to storm the citadel of contemporary literary studies.

(1) The goal of explaining the human taste for fiction (a problem in evolutionary psychology) sits uneasily with the goal of improving the analysis and criticism of specific works of fiction (a problem in departments of English and other literatures). It's conceivable that evolutionary thinking will raise, and eventually solve, the scientific question of why we enjoy fiction without offering anything to the field of literary criticism beyond our folk theories of human nature. (Under this scenario, evolution would explain *why* those folk theories are true, but would not add anything to the power of those theories to illuminate specific works of literature.) I don't think it will come down to this, but advocates of Darwinian lit-crit should be prepared to spell out what they hope evolution will add to literary analysis beyond a rehabilitation of the relevance of a conception of human nature. This in turn may require a more explicit rationale of what literary criticism itself is for, and why we attach so much importance to it—the kind of justification that many humanities scholars find philistine and demeaning, but that scientists are forced to muster every time they write a grant proposal.

(2) Theories of the possible evolutionary functions of fiction need to be sharpened so that they approach the standards of evolutionary biology itself, and dispel the canard that evolutionary theories can never rise above just-so-stories.[11] As I've emphasized, this requires thinkers to look outside fiction, and outside psychology, to the kinds of engineering analysis that could rationalize the possible benefits to an intelligent social agent of exploring fictitious worlds. Darwinian literature scholars who want to show that fiction is a cognitive adaptation thus should look more closely at research in Artificial Intelligence on the design of intelligent systems. It's also possible that some day the information will flow in both directions, and that AI researchers will consult literary scholars for insight into how to make computers smarter by exploring hypothetical worlds the way people do.

(3) In this vein, a consilient literary scholarship should avail itself not only of evolutionary psychology but of the other sciences of human nature: artificial intelligence on the nature of intelligent systems, cognitive science on visual imagery and theory of mind, linguistics on the use of language to narrate plots and control readers' attention, behavioral genetics on the development of personality and its dimensions of variation, social psychology on the biases that govern our behavior in groups

and our limited awareness of them.[12] Even the topics in evolutionary psychology that are brought in to this volume fall into a narrow range centered on mating and sex differences, leaving out such potentially fecund topics for literature as parent-offspring conflict, sibling rivalry, self-deception, reciprocity, taboo, coalitional psychology, and the moral emotions.

(4) The seldom-analyzed difference between high culture on the one hand and low and middlebrow culture on the other is something of an embarrassment for research in the psychology of the arts. For one thing, though Darwinian literary critics aspire to invoke human universals to explain the arts, their professional standards and their personal tastes may lead them to study forms of art that appeal to 1% of the population (people like themselves) and to ignore the forms that appeal to 99%. Also, since highbrow and avant-garde genres often define themselves in defiant opposition to low- and middlebrow culture, and to the high culture of a previous period, they are bound to refute just about any generalization of the nature of art that anyone will ever make. Psychologically-oriented scholars of literature will have to get used to some slumming, or at least give some attention to the variables that differentiate forms of literature with different levels of popularity and prestige, if for no other reason than to eliminate a source of uncontrolled variance in the phenomena they are studying.

(5) Several of the contributors (especially Nettle, Fox, Carroll, and Scalise Sugiyama) rightly focus on the ways that fiction explores a character's struggle to negotiate conflicting goals within themselves and among one another. The traditional idea from literary analysis that plot is driven by conflict is a natural complement to the idea from evolutionary psychology that partial conflicts of interest are inherent to all social relationships—parent and offspring, sibling and sibling, spouse and spouse, man and woman, cooperator and cooperator, ally and ally, rival and rival, even one part of the self and another. The partial conflicts that our biology makes us heir to are far richer with combinatorial possibilities than either pure overlap of interest (as in clonal organisms, or the cells of a body) or pure conflict of interest (as in predator and prey). They have much to do with the fact that plots in fiction are open-ended and eternally fascinating, rather than a fixed repertoire of features of human nature put on display and endlessly recycled. Darwinian lit-crit should zero in on the logic of these conflicts with the help of evolutionary game theory, and use them as building blocks for the analysis of plot and character.

(6) For similar reasons, evolutionary literary analysts should be far more skeptical of the idea that "group cohesion" is a basic human motive and that it can be readily explained by "group selection." Group selection fell out of favor among evolutionary biologists with the sociobiological revolution of the 1960s and 1970s, though D. S. Wilson is trying to resuscitate it. Within biology, it's still unclear whether Wilson's concept of "group selection" adds anything to the ideas that a group is part of the environment in which some organisms are selected, and that a set of cooperating or related organisms can redundantly be dubbed a "group." Both of these unexceptionable suggestions are very different from the precise meaning of "group selection" in which the traits of a group qua group (size, structure, cohesion, division of labor), separate from the properties of the individuals making up that group, are selected across iterated cycles of high-fidelity replication in the way that genes are. More to the point, the gluey metaphors inspired by group selection (bonding, social cohesion, and so on) don't do justice to the ambivalent mixture of selfish, nepotistic, strategic, and self-advertising motives that really animate a person's feelings toward his or her group, and that fiction deliciously plays out for us. People in social groups are not like ants in a colony, cells in a body, or components of a well-oiled machine. I think John Updike got it right when he said, "Fiction, in its groping way, is drawn to those moments of discomfort when society asks more than its individual members can, or wish to, provide. Ordinary people experiencing friction on the page is what warms our hands and hearts as we write."

Despite these reservations, I found *The Literary Animal* to be an exciting book. It isn't often that one can be present at the genesis of a new field of knowledge, especially one with the promise of connecting two realms—the exploration of human nature by science and by art—that clearly have so much to learn from each other.

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1. See, e.g., Carl Woodring, *Literature: An Embattled Profession* (New York: Columbia University Press, 1999); Brian Boyd, "Getting It All Wrong: Bioculture Critiques Cultural Critique," *American Scholar* (Autumn 2006): 18–30; and the articles cited in Steven Pinker, *The Blank Slate: The Modern Denial of Human Nature* (New York: Viking, 2002), p. 400.

2. Steven Pinker, *The Blank Slate*.

3. Joseph Carroll, *Evolution and Literary Theory* (Columbia: University of Missouri Press, 1995); Brian Boyd, "Getting It All Wrong"; Denis Dutton, "Delusions of Postmodernism," *Literature and Aesthetics* 2 (1992): 23–35.

4. Steven Pinker, *How the Mind Works* (New York: Norton, 1997), pp. 208–10; Dan Sperber, "Anthropology and Psychology: Towards an Epidemiology of Representations," *Man* 20 (1985): 73–89; Donald Symons, "On the Use and Misuse of Darwinism in the Study of Human Behavior," in *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, ed. J. H. Barkow, L. Cosmides, and J. Tooby (New York: Oxford University Press, 1992); John Maynard Smith and N. Warren, "Models of Cultural and Genetic Change," in *Games, Sex, and Evolution*, ed. J. M. Smith (New York: Harvester-Wheatsheaf, 1988); Martin Daly, "Some Caveats about Cultural Transmission Models," *Human Ecology* 10 (1982): 401–8; A. Norenzayan and S. Atran, "Cognitive and Emotional Processes in the Cultural Transmission of Natural and Nonnatural Beliefs," in *The Psychological Foundations of Culture*, ed. M. Schaller and C. Crandall (Mahwah, N.J.: Erlbaum, in press).

5. John Tooby and Leda Cosmides, "On the Universality of Human Nature and the Uniqueness of the Individual: The Role of Genetics and Adaptation," *Journal of Personality* 58 (1990): 17–67.

6. Robert Trivers, "Parental Investment and Sexual Selection," in *Sexual Selection and the Descent of Man*, ed. B. Campbell (Chicago: Aldine, 1972).

7. D. M. Buss, *The Evolution of Desire* (New York: Basic Books, 1994).

8. J. R Hobbs, *Literature and Cognition* (Stanford: Center for the Study of Language and Information, 1990).

9. C. Riesbeck and R. C. Schank, *Inside Case-based Reasoning* (Mahwah, N.J.: Erlbaum, 1989).

10. Geoffrey Miller, *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature* (New York: Doubleday, 2000).

11. G. C. Williams, *Adaptation and Natural Selection: A Critique of Some Current Evolutionary Thought* (Princeton: Princeton University Press, 1966); Donald Symons, "On the Use and Misuse of Darwinism in the Study of Human Behavior," in *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, ed. Jerome H. Barkow, Leda Cosmides, and John Tooby (New York: Oxford University Press, 1992); H. K. Reeve and P. W. Sherman, "Adaptation and the Goals of Evolutionary Research," *Quarterly Review of Biology* 68 (1993): 1–32.

12. See the references in *The Blank Slate*, pp. 417–18.