
CHAPTER 48

Evolutionary Literary Study

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INTRODUCTION

Evolutionary literary study has emerged only in the past 20 years or so, and its practitioners still constitute a relatively small community on the margins of the academic literary establishment. That establishment is oriented to poststructuralist ideas and thus repudiates the ideas both of human nature and of objective scientific knowledge (Carroll, 1995; Carroll, Gottschall, Johnson, & Kruger, 2012, pp. 1–6; Culler, 2011). Evolutionary literary critics embrace the notion of “consilience,” affirm the cogency of evolutionary theory, and assimilate the findings of the evolutionary social sciences. They would agree with E. O. Wilson that the world is a unified causal order and that knowledge forms an integrated field encompassing the physical sciences, the social sciences, and the humanities (Carroll, McAdams, & Wilson, in press; Slingerland & Collard, 2012; E. O. Wilson, 1998). They affirm that human mental and cultural activity is constrained by the principles that regulate all biological activity, that life has evolved through an adaptive process by means of natural selection, and that complex functional structure in living things has been produced by adaptation. They argue that the adapted mind produces literature and that literature reflects the structure and character of the adapted mind.

In the 1990s and early 2000s, much of the work done in evolutionary literary study was polemical and programmatic. Scholars attacked the cultural constructivist ideas prevailing in the academic literary establishment, rehearsed the basic logic of the adaptationist program, and made exploratory efforts to formulate principles of interpretation that could be linked to specifically evolutionary ideas (B. Boyd, 1998; Carroll, 1995, 2004; Cooke, 2002; Cooke & Turner, 1999; Easterlin, 2000, 2001, 2004; Gottschall, 2001, 2003a, 2003b; Gottschall, Martin, Quish, & Rea, 2004; Headlam Wells, 2005; Jobling, 2001; Love, 1999a, 1999b, 2003; Scalise Sugiyama, 1996, 2001a, 2001b, 2001c; Storey, 1996; Thiessen & Umezawa, 1998). Over the past decade, polemics and programmatic rehearsals have diminished while literary theory and interpretive literary criticism have matured (Anderson & Anderson, 2005; B. Boyd, 2008, 2009; B. Boyd, Carroll, & Gottschall, 2010b; Carroll, 2011b, 2012b, 2012c, 2013a, 2013c, 2013e, 2013f; Clasen, 2010, 2012a, 2012b, 2012c, in press; Duncan, 2010; Dutton,

2009; Easterlin, 2012; Gansel & Vanderbeke, 2012; Gottschall, 2008b, 2012; Gottschall & Wilson, 2005; Headlam Wells, 2011; Jonsson, 2012, 2013; Keener, 2010; Martindale, Locher, & Petrov, 2007; Nordlund, 2007; Saunders, 2007, 2009, 2012a, 2012b; Swirski, 2006, 2010, 2011; Vermeule, 2010).

Most evolutionary literary study still uses the discursive, speculative methods characteristic of the humanities. A few evolutionary literary scholars have assimilated empirical methods from the social sciences and a few evolutionary social scientists have taken literature as their subject matter (Carroll, Gottschall, et al., 2012; Carroll, Johnson, Gottschall, & Kruger, 2012; Gottschall, 2008a; Johnson, Carroll, Gottschall, & Kruger, 2008, 2011; Kruger, Fisher, & Jobling, 2003; Mar, 2004; Mar & Oatley, 2008; Mar, Oatley, Djikic, & Mullin, 2011; Mar, Peskin, & Fong, 2011; Miall & Dissanayake, 2003; Oatley, Mar, & Djikic, 2012; Whissel, 1996).

HUMAN NATURE, CULTURAL NORMS, AND THE ARTS

Over the past several decades, the evolutionary human sciences have gradually developed a good working model of human nature. The early sociobiological emphasis on reproductive success was modified by the evolutionary psychologists' insistence on "proximate" or mid-level motives (Laland & Brown, 2002). Evolutionary psychologists, emphasizing "modules" or hard-wired bits of cognitive machinery, sometimes left out "general intelligence," but a broader conception of human cognitive architecture has corrected that mistake (Chiappe & MacDonald, 2005; Geary, 2005; Geary & Huffman, 2002; MacDonald, 1991; MacDonald & Hershberger, 2005; Mithen, 1996). Early sociobiologists tended to limit human social interaction to kinship and the exchange of favors, but evolutionary biologists and social scientists have been developing more complete and adequate accounts of specifically human capacities for cooperative group endeavor (Boehm, 1999, 2012, in press; Buckholtz & Marois, 2012; Carroll, 2015; Chudek & Henrich, 2011; Fukuyama, 2011, pp. 339–440; Gintis, 2003, 2011; Gintis & Van Schaik, 2012; Haidt, 2012; Henrich et al., 2010; Hill, 2007; Nowak, 2006; Nowak & Highfield, 2011; Nowak, Tarnita, & Antal, 2010; Simpson, 2011). Evolutionists in the humanities have been making increasingly effective arguments that forms of imaginative culture—the arts, religions, ideologies—are integral parts of the human adaptive repertory (B. Boyd, 2005; Carroll, 2008a, 2012a; Dissanayake, 2000). Those arguments converge with the now rapidly developing concept of "gene-culture co-evolution"—the idea that humans are genetically disposed to produce culture, and that over evolutionary time culture alters the human genome (Carroll, 2011a; Chudek & Henrich, 2011; Chudek, Zhao, & Henrich, in press; Cochran & Harpending, 2009; Gintis, 2003; Irons, 2009; Lumsden & Wilson, 1983, 2005; Richerson & Boyd, 2005). Early evolutionary psychology grouped its mid-level or "proximate" motives into open-ended lists (Carroll, 1999). Those lists are now being replaced with "human life history theory": the idea of a systemic organization of all the components of human nature (Burkart, Hrdy, & Van Schaik, 2009; Burkart & van Schaik, 2010; Carroll, 2011a; Foley & Gamble, 2009; Gintis & Van Schaik, 2012; Hill, Barton, & Hurtado, 2009; Hrdy, 2005, 2009; H. Kaplan, Gurven, & Winking, 2009; H. S. Kaplan, Gurven, & Lancaster, 2007; H. S. Kaplan, Hooper, & Gurven, 2009; Klein, 2009; Lancaster & Kaplan, 2007; Muehlenbein & Flinn, 2011; Wade, 2006; Wrangham, 2009; Wrangham & Peterson, 1996). Beneath all variation in the details of organization, the life history of every species forms a reproductive cycle. In the case of human

beings, successful parental care produces children capable, when grown, of forming adult pair bonds, becoming functional members of a community, and caring for children of their own. Human life history theory thus integrates the sociobiologists' "ultimate" level of casual explanation—reproductive success—with the evolutionary psychologists' mid-level explanations focusing on immediate motives such as mating, parenting, and striving for social status.

In literature and in casual conversation, when people use the phrase "human nature," they usually have in mind basic human motives: survival, mating, parenting, favoring kin, and acting as members of a social group (Carroll, 2012e). Human nature is important in fiction because most stories are built out of basic human motives and emotions. Stories are about struggling to survive, seeking romantic love, maintaining family relationships, satisfying ambitions, making friends, forming coalitions, and striving against enemies.

Human nature manifests itself in basic human motives that are channeled into specific cultural norms (Buckholtz & Marois, 2012; Carroll, 2015; Chudek & Henrich, 2011; Haidt, 2012; Sripada & Stich, 2005; Tomasello, 2009). Those norms are articulated in imaginative form through myths, legends, rituals, images, songs, and stories. Humans universally regulate their behavior in accordance with beliefs and values that are made vividly present to them in the depictions of art, including fictional narratives, dramatic representations, films, and poetic verses.

Literature is the written version of an oral behavior—the verbal representation of imagined actions—that is universal in preliterate cultures. Whenever the word "literature" appears in this chapter, it may be taken tacitly to signify the larger concept, "literature or its oral antecedents."

IMAGINATIVE VIRTUAL WORLDS AND THE ADAPTIVE FUNCTION OF THE ARTS

All of us, at all times, inhabit imagined worlds. An imagined world is an emotionally and aesthetically modulated vision of oneself and the world one inhabits (Carroll, 2012e; McAdams, 2006, 2008, 2009, 2011, in press; McAdams & Olson, 2010). Emotional modulation involves basic emotions such as disgust, joy, and sorrow (Ekman, 1999). Aesthetic modulation involves sensory feeling tones such as coarse, fine, ugly, or beautiful (Carroll, 2013b; Davies, 2012; Dutton, 2009). An imagined world contains the present within a temporal continuum that includes the past and the future. The past is not only the personal past but the historical or mythic past. The future is not only one's own personal future but the future of the world; it can contain an eternity of punishment or bliss, or a perpetual shadowy semi-existence in a ghostly limbo. An imagined world contains communities—all the people with whom one shares beliefs, values, and experiences.

The imagined worlds we inhabit overlap with the imaginative virtual worlds created by artists or by collective cultural efforts extending over generations or centuries. Imaginative virtual worlds feed into our imagined worlds, profoundly influencing the way we imagine our own actual lives. For instance, the Biblical myth of the creation of the world is, for many people, part of the imagined actual world that they inhabit. So also with Islam, Hinduism, the communist world vision that occupied half the world just a couple of decades ago, and with every set of cult beliefs that leads people to radically alter their life trajectories, prompting them sometimes even to mass

suicide. On a more local level, people who read novels, watch films, listen to popular music, or attend operas assimilate images of personal and social identity that they incorporate into their own sense of who they are (Carroll, Gottschall, et al., 2012; Dissanayake, 2000; Gottschall, 2012; McAdams, 2011; Tooby & Cosmides, 2001).

In many forms of art, multiple arts are combined to fashion imaginative virtual worlds. Operas and musicals integrate dramatic depiction, music, costume, and setting. Films integrate dramatic depiction, music, and the visual characteristics of camera work, lighting, and editing. Songs integrate instrumental music with lyric and narrative poetry; music videos integrate those art forms with the arts of film. A church is an institution designed to give official housing to a shared imaginative virtual world that contains supernatural agents, immortal souls, a mythic beginning of the world, a final day of judgment, and an eternity of blisses and torments. Churches use architecture, statuary, painted images, colored glass, instrumental music, choral song, ritualized movements and vocal utterances, costumes, and even perfumed smoke to create a sensory surround giving concrete aesthetic form to the beliefs invested in doctrine and myth. In many societies, rituals also include dance and chanting (Dissanayake, 1992, 2000).

We are not always reading a novel, attending the opera, watching a movie, sitting in church, looking at pictures in a museum, or listening to music. But we are always conscious of emotionally and aesthetically modulated images of ourselves and of the world we inhabit (McAdams, 2011). We designate such consciousness by terms such as moods, feelings, beliefs, values, memories, associations, projections, goals, self-images, and world views. When we sing, draw, play an instrument, or dance, we are giving expression to the subjective sensations that inform our everyday lives. The imagined worlds we inhabit are imbued with our experience of music, painting, architecture, dance, drama, narrative literature, poetry, and film.

THE DEGREE OF CONSENSUS ABOUT THE ADAPTIVE FUNCTION OF THE ARTS

Steven Pinker argues that the arts are pleasure technologies like recreational drugs or pornography; the arts, he says, are used to exploit brain mechanisms that evolved for adaptive functions unrelated to the arts (Carroll, 2012a; Carroll, Johnson, et al., 2012, Ch. 5; Pinker, 1997, 2007). Geoffrey Miller argues that the arts are forms of sexual display—costly signals that have no primary adaptive functions (2000). Hypotheses by other theorists have converged toward a common point: the idea that literature and the other arts affect cognitive and emotional organization, influence motives, and help regulate behavior (B. Boyd, 2009; Carroll, 2008a, 2008b, 2012a; Carroll, Gottschall, Johnson, & Kruger, 2010; Carroll, Gottschall, et al., 2012; Deacon, 1997; Dissanayake, 1992, 2011; Dutton, 2009; Easterlin, 2012, 2013; Gottschall, 2012; Mar & Oatley, 2008; Panksepp & Panksepp, 2000; Salmon & Symons, 2004; Tooby & Cosmides, 2001; E. O. Wilson, 1998, Ch. 10). Many biocultural theorists would agree that basic human motives are channeled into specific cultural norms and that specific cultural norms are articulated in imaginative form through myths, legends, rituals, images, songs, and stories. They would agree also that humans universally regulate their behavior in accordance with beliefs and values that are made vividly present to them in the arts. Those points of agreement are signified by the term “imaginative virtual worlds.” The theory of imaginative virtual worlds subsumes more particular ideas that the arts can

provide practically useful information (Scalise Sugiyama, 1996, 2001a, 2001b, 2004, 2006), offer game-plan scenarios to rehearse potential adaptive challenges (Pinker, 1997), provide means for sexual display (Dutton, 2009; Miller, 2000), enhance pattern recognition and stimulate creativity (B. Boyd, 2009), and provide a medium for shared social identity (B. Boyd, 2009; Carroll, Gottschall, et al., 2012; Dissanayake, 2000).

The human disposition to inhabit imaginative virtual worlds evolved through gene-culture coevolution. The theory of gene-culture coevolution was first proposed by Lumsden and Wilson more than three decades ago, but it has begun to emerge as a robust and integrative theory only within the past few years (R. Boyd, Richerson, & Henrich, 2011; Carroll, 2011a, 2012a; Carroll et al., 2010; Chudek & Henrich, 2011; Chudek et al., in press; Cochran & Harpending, 2009; Lumsden & Wilson, 1981, 1983; Richerson & Christiansen, 2013; E. O. Wilson, 1998, Ch. 10). As evolutionists in the social sciences continue to develop the theory of gene-culture coevolution, it seems likely that they will increasingly recognize that the arts are integral parts of the uniquely human adaptive repertoire. Evolutionists in the humanities can draw on findings from research into gene-culture coevolution and can also contribute directly to that research.

THE GOALS OF BIOCULTURAL RESEARCH

Even 20 years ago, we understood far less than we now do about the human evolutionary trajectory, and especially less about the uniquely human, biocultural character of that trajectory. Many researchers in both the evolutionary human sciences and the evolutionary humanities have not yet caught up with the most advanced thinking about gene-culture coevolution, and that thinking is itself still in its beginning phases. One important area for future research is the study of specific periods in history: research that integrates ecological, reproductive, social, religious, ideological, economic, political, literary, and artistic aspects of biocultural thinking. A few scholars have already begun contributing key elements to that kind of integrative research (Carroll, Gottschall, et al., 2012; Fukuyama, 2011; Gat, 2008; Gottschall, 2008b, 2012; Oakley, 2007; Pinker, 2011; Turchin, 2006; D. S. Wilson, 2002). The cultural imagination interacts causally with material conditions and forms of social organization. Consequently, findings about social and cultural dynamics in specific historical periods should constrain and stimulate evolutionary social theory. Working cooperatively toward common goals, evolutionary social theorists, historians, and scholars of literature and the other arts can produce results more satisfactory than could be produced by researchers remaining within the boundaries of their own disciplines.

A major goal for integrative biocultural research would be to create, collectively, a total explanatory grid for every specific culture—every society located in a particular ecology, organized by a specific socioeconomic and political structure, and informed by specific religious, ideological, and aesthetic traditions. That grid would extend in two directions. For ultimate causal explanation, it would extend toward basic, universal principles of biology and evolutionary psychology. In the other direction, the grid would extend toward finely nuanced detail in understanding the evocation of subjective particularities of experience for individuals within any given culture. The analysis of specific historical cultures would thus form the pivotal link between universal causal explanation, the aim of the sciences, and the analysis of particularistic subjective evocation, a chief activity in the humanities. The explanatory continuum

would be unbroken. Knowledge and imaginative experience would form a seamless web of knowledge.

ANALYZING MEANING IN LITERARY REPRESENTATIONS

Both actual human experience and depicted human actions have three main components: individual persons (characters), a surrounding world (setting), and sequences of events connected by emotionally meaningful concerns (plots). Literary authors can seek to give exact and faithful accounts of what actual experience is like in a concretely detailed physical and social world occupied by ordinary people engaged in activities that are constrained by commonplace conditions. We call that kind of literature “realism.” Authors can also depict imagined situations in which characters exemplify elemental emotions and abstract ideas; in which settings exemplify emotional or imaginative aspects of experience; and in which plots fulfill the inner logic of some emotional or imaginative process relatively unconstrained by ordinary physical conditions. We call that kind of literature “symbolism.” Myths and fairy tales offer examples. Realism and symbolism represent not mutually exclusive alternatives but polar points on a continuum, and all literature has some measure both of realism and of symbolism (Carroll, 1995, Ch. 3). Dickens, for example, both depicts the actual conditions of Victorian urban life and also creates characters and plots that often seem more like those of myth or fairy tale than those of simple realist fiction.

Every author has a culturally modulated identity, an idiosyncratic temperament, and a unique set of personal experiences (Bauer & McAdams, 2004; Carroll, in press; Habermas & Bluck, 2000; McAdams, 2001, 2006, 2009, 2011, in press; McAdams & Bowman, 2001; McAdams, Josselson, & Lieblich, 2001, 2006; McAdams & Olson, 2010). The author can only envision depicted events from within the author’s own world view. Readers responds to depicted events and also to the personality and manner of the author. This interaction between authors and readers is a fundamental part of the total literary experience and is an indispensable part of what a literary interpretation takes into account (Carroll, Gottschall, et al., 2012; Gibbs, 2013; Gottschall, 2012; Mar & Oatley, 2008; Oatley, 1999).

Interpretive criticism characterizes the author’s conception of his or her subject (themes), the orchestrated sequence of emotions expressed and evoked by the work (tone), and the organization of verbal components in the work (form and style). These three categories of interpretive criticism can be lodged within an evolutionary conception of human nature. The subject matter of literature are human motives and behavior. Human life history theory and evolutionary social psychology identify the main phases and concerns of human life and thus also of literature (Carroll, 2012; Figueredo & Wolf, 2009; H. Kaplan et al., 2009; Lancaster & Kaplan, 2007; Muehlenbein & Flinn, 2011). Orchestrated sequences of emotions can best be understood by appeal to universal emotions and affective neuroscience (Carroll, Gottschall, et al., 2012; Carroll, Johnson, et al., 2012; Ekman, 2007; Panksepp, 2011; Panksepp & Biven, 2012; Plutchik, 2003). Formal structures derive from and reflect the properties of our evolved cognitive architecture. The “cognitive rhetoricians” have suggested some avenues of approach into formal organization but have stopped short of connecting formal analysis with a larger model of human nature (Hogan, 2003; Turner, 1991, 1996; Zunshine, 2006, 2008, 2010). Brian Boyd has made evolutionary formal analysis a salient aspect of his work (B. Boyd, 2009, in press).

Thematic, tonal, and formal criticism cover the whole spectrum of internal structure in a literary work. A full understanding of a literary work situates analysis of internal structure within larger contexts: the interactions among authors and readers and the cultural complex within which that interaction takes place. At the highest level of criticism, structural and contextual criticism is lodged explicitly within explanatory terms from some specific theory about literature (Bordwell, 2008, p. 46; Carroll, Gottschall, et al., 2012, pp. 59–69; Hirsch, 1967). Such theories necessarily include ideas about human psychology, language, representation, and the basic causal forces that shape the world in which represented actions and communicative social relations take place.

Ideally, an evolutionary critique of any given literary work or set of works would analyze thematic, tonal, and formal organization; locate the work or works in a cultural context; explain that cultural context as a particular organization of the elements of human nature within a specific set of environmental conditions (including cultural traditions); register the responses of readers; describe the sociocultural, political, and psychological functions the work fulfills; locate those functions in relation to the evolved needs of human nature; and link the work comparatively with other artistic works, using a taxonomy of themes, formal elements, affective elements, and functions derived from a comprehensive model of human nature.

WORLD VIEWS OF AUTHORS AND CRITICS

Literary theorists and critics ultimately reduce depicted events to thematic structures that reflect their own beliefs about psychological and social processes. In that respect, evolutionary critics are like critics of any other school—Marxists, Freudians, deconstructionists, feminists, and Foucauldian cultural critics. What distinguishes an evolutionary approach is that evolutionary critics use evolutionary social science as the common frame within which they assess the conceptual order of any depicted action (Carroll, 2013a, 2013c; Gottschall, 2008b; Saunders, 2009, 2010, 2012a).

Most authors have a strong intuitive understanding of human nature. That understanding is one of the prerequisites for being an author. Evolutionary critics analyze the way the intuitive understanding of any given author is made to fit within the author's world view. Authors sometimes give depictions of human behavior in which some personal bias or some religious, ideological, or theoretical preconception interacts with his or her intuitive understanding. Such interactions are also materials for an evolutionary interpretive analysis (Carroll, 2013a).

Evolutionists need not make the naïve mistake of assuming that authors share an evolutionary viewpoint. Historically, for authors writing before the publication of *The Origin of Species*, that is not even possible. What evolutionary critics assume is that all world views can ultimately be explained within an evolutionary framework. Christians, Hindus, Muslims, Buddhists, Marxists, Scientologists, and practitioners of Voodoo all have world views, and those world views can all be explained by causal forces operating within the adapted mind.

THE FUTURE

Literary Darwinists have emerged and survived on the margins of the literary establishment, like small early mammals creeping about nocturnally among the

feet of sleeping dinosaurs. The dinosaurs in this case consist of two populations. One population is composed of the last lingering elements—most of them gray, stiff, and fragile—of old-fashioned, humanist critics—*belle-lettristic*, archivalist, and a little lost and disoriented in the modern world of progressive empirical knowledge (Abrams, 1989, 1997; Carroll, 2004, pp. 29–39; Carroll, Boyd, & Deresiewicz, 2009; Carroll, Gottschall, et al., 2012, pp. 171–173; Crews, 1986, 2006, 2008; Deresiewicz, 2009; Goodheart, 2007, 2009; Patai, 2005; Pigliucci, in press). The other population is composed of the postmodern establishment, no longer revolutionary but fully ensconced in all the precincts of academic power (B. Boyd, 2006; B. Boyd, Carroll, & Gottschall, 2010a; Crews, 2001; Culler, 2011; Headlam Wells, 2005; Menand, 2005). This population can be compared to an invading army that has conquered a vast district, ravaged it, left it destitute, and has thus deprived itself of the resources necessary to maintain itself on the ground it has conquered. The purely theoretical impulses animating postmodernism inspired the first wave of invaders, the deconstructionists, but that wave had already subsided by the late 1980s and had been superseded by the much more heavily political criticism of the Foucauldians, supplemented by their auxiliaries of gender, postcolonial, and ethnic critics. That secondary political wave has now also exhausted its momentum, and the literary establishment finds itself in a period of stasis and fatigue, isolated both from the progressive empirical sciences and from the interests and tastes of educated public opinion (Bérubé & Nelson, 1995; Carroll, Gottschall, et al., 2012, pp. 1–9; Feal, 2005). The intellectual works that appear on nonfiction bestseller lists are not the works of Althusserian Marxists, Lacanian psychoanalysts, or Kristevan feminists. They are the works of primatologists such as Frans de Waal and Richard Wrangham, biologists such as Edward O. Wilson and Richard Dawkins, and evolutionary psychologists such as David Buss, Steven Pinker, Jonathan Haidt, and Daniel Goleman.

In the future, academic literary study could take any of three possible paths. Along one path, evolutionary literary study would remain on the margins of the academic establishment, ignored or rejected (Carroll, 2012d; Carroll et al., 2009; Carroll & Gottschall, 2008; Crews, 2008; Dawson, 2006; Deresiewicz, 2009; Goodheart, 2007, 2009; Kramnick, 2011; Menand, 2005; Peterson, 2008; Spolsky, 2008). In a second path, evolutionary criticism could be incorporated as just another of many different “schools” of literary theory (B. Boyd, 2013; Gottschall, 2013), with no one school claiming any particular priority over other schools. If academic literary study took this path, casebooks of essays would include a Darwinist essay along with essays by Marxists, Freudians, feminists, and Foucauldians. In the third path, the evolutionary human sciences would fundamentally transform and subsume all literary study (Carroll, 2011b, pp. 71–87; 2013d).

Which path is most likely? If one were to base predictions on the current status of evolutionary study in the humanities, the first or second path might seem the most likely. If one bases prediction on the inherent appeal of developing knowledge, the third will seem most likely. No other currently active theory lodges itself in a biological view of the human mind. No other theory thus makes it possible to integrate literary study with the rapidly developing body of knowledge from evolutionary biology and the evolutionary social sciences. If consistency with empirically grounded forms of knowledge is the criterion by which we assess the validity of literary theories, the currently active alternatives to evolutionary literary study willingly disqualify themselves. Only the evolutionary understanding of literature offers the prospect for a cumulative development of literary research consistent with a broad range of scientific knowledge.

Knowledge about human behavior is set inexorably on a course toward integration from within evolutionary theory (Carroll, in press; E. O. Wilson, 1998). As research in human behavior molds itself to the inherent structure of reality, the disciplinary organization of higher education will need to adjust itself to the actual shape of knowledge. The current organization of segregated disciplines will have to become more fluid and flexible. Already, researchers in the vanguard of the evolutionary human sciences regularly cross disciplinary boundaries in order to integrate information from primatology, evolutionary anthropology, evolutionary psychology, behavioral ecology, comparative ethology, cognitive and affective neuroscience, behavioral genetics, personality psychology, social psychology, and other such disciplines. Evolutionary humanists draw on all this information and insistently point toward the evolutionary significance of their own subject matter—the products of imaginative culture.

For evolutionary social scientists, institutional adjustments within the social sciences will require no great alteration in outlook—in the scope of subject matter, in methods, or in standards of validity. The greatest impediment to a full integration of knowledge about human behavior remains the gap between the social sciences and the humanities. Many humanists are intimidated by science or regard it as inherently antipathetic to the subject matter of the humanities; many scientists tacitly dismiss the subject matter of the humanities as trivial or regard it as beyond the reach of scientific method. All of that will have to change.

To bring about a large-scale transformation in the institutional structures that separate the humanities and the social sciences, it would be helpful to create programs designed specifically for that purpose. A prototype already exists in the evolutionary studies programs initiated at SUNY Binghamton by D. S. Wilson and copied at many other colleges and universities (EvoS: <http://evostudies.org/>). Along similar lines, a recently created program at Aarhus University in Denmark, the Center for Biocultural History, focuses specifically on the biocultural history of Denmark, from prehistoric times to the present (<http://bioculture.au.dk/>). The EvoS programs offer certificates at the undergraduate and graduate level, but they work within the current structure of academic departments, requiring students to select a distribution of courses from within those departments. For the most part, the work of synthesis is left up to the student himself or herself. A more radical approach would be to establish programs designed specifically for integrative biocultural research.

In one possible model for an institute of biocultural research, students would be required to take a distribution of courses designed to parallel main areas of emphasis from within an evolutionary view of human life. Topics for such courses might include basic evolutionary theory, the course of human evolutionary history, human life history theory, hunter-gatherer ecology, evolutionary behavioral psychology, cognitive and affective neuroscience, the evolution of human sociality, biocultural aesthetic and literary theory, and biocultural courses in specific historical periods. In this hypothetical model, students would be trained in ways that cancel or at least diminish the basic differences in research methods in the social sciences and the humanities. Students could be required to take or to test out of an introductory year-long course in statistics and empirical methods. Students coming into the institute from biology or the social sciences would already have that background and would have the option of taking more advanced statistical courses when they needed them.

The pedagogical outcomes envisioned for this program would extend across a range occupied by polar extremes: at one extreme, pure empirical social science oriented to the study of literature—the kind of thing being done now by researchers like Raymond Mar and Keith Oatley; and at the other extreme, purely discursive, essayistic commentary on literature, like that produced now by the majority of literary Darwinists. Students engaging in predominantly empirical, quantitative research would also have taken intensive courses in cultural history and literature. Students engaging in predominantly discursive forms of commentary would have taken courses that involve hands-on empirical research. They would thus at the least have expertise sufficient to evaluate the results of empirical research and to engage in collaborative work with empirical researchers. Much of the work done in any such biocultural institute would perhaps fall somewhere in between the polar extremes.

David Sloan Wilson conducted a survey in which he asked contributors to the journal *Behavioral and Brain Sciences* whether evolutionary ideas had been a significant part of their graduate training (2007, pp. 6–7). The majority of the respondents said no. They had been credentialed within some established discipline and then later, as established scholars, had incorporated evolutionary thinking in their research. Now, of course, robust programs in evolutionary psychology and evolutionary anthropology are in place at major universities in many countries. Graduate students in psychology and anthropology have been trained in specifically evolutionary ways of thinking, have gained tenured positions, and now have graduate students of their own.

The first generation of evolutionary social scientists faced stiff resistance from within their own fields (Kenrick, 2011; Segerstråle, 2000). Evolutionary scholars in the humanities face opposition even more stubbornly entrenched. By filtering admissions into graduate study, two or three generations of poststructuralists have perpetuated themselves. Institutional inertia is a political reality. At present, students of literature who overtly profess sympathy for evolutionary psychology find most graduate programs closed to them (Carroll, 2013e; Gottschall & Wilson, 2005, pp. xvii–xxvi; Kean, 2011). Consequently, in the short term, one can reasonably anticipate only very limited movement from within departments of literature. A graduate institute designed specifically to train doctoral candidates in biocultural research could serve as the thin end of a wedge ultimately transforming the character of research in the humanities.

The Darwinian revolution that has taken place in the social sciences will in all likelihood ease the way for evolutionary humanists. So long as the social sciences followed the standard social science model (Tooby & Cosmides, 1992), humanists could comfortably presuppose that culture, independently of biology, creates all content of human minds and has sole causal power over human behavior. The larger intellectual context within which the humanities operate has now fundamentally changed. The humanities are increasingly isolated from other fields in the university and from generally educated people. Institutional inertia within the humanities is in tension with the pressure exerted by the mass and creative energy of serious intellectual life outside the humanities. Continued stasis, isolation, degeneration? Or a gradual breaking up of stubbornly retrograde intellectual commitments? The answer to this question matters a great deal to young people who have talents and interests leading them toward research about imaginative culture. It matters a great deal also for the whole community of scholars who wish to achieve a full, complete understanding of human nature.

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