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The Functions of Literature and the Evolution of Extended Mind

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Given the current climate of higher education, the question of the usefulness of literature is pressing. As the United States moves inexorably toward a practical notion of the university's mission, all of the humanities, and perhaps most particularly arts-centered disciplines in state-funded systems, have to fight for their survival. Without doubt, this is, at present, a losing battle. However, the urgency of this matter may obscure the fact that conceptions of literature's use have varied considerably, not only over several thousand years of aesthetic theory, but within the much shorter span—about a hundred and fifty years—of the institutionalization of literary studies. According to Gerald Graff, "The typical American college [in the early nineteenth-century] was a quasimonastic institution where 'the preparation of individuals for Christian leadership and the ministry' . . . was considered a more important goal than the advancement of knowledge."[1] If university education in the first half of the nineteenth century functioned primarily to cultivate a male social elite, and if language and literary study thus came to serve a central role in reproducing a patriarchal, classist hierarchy, those values have, most assuredly, lost luster over time.

Understandably, literary scholars are dismayed by the narrow instrumentalism now organizing the agenda of higher education. At the same time, glancing back over the formation of English studies, one observes that values often utterly divorced from intellectual objectives have driven the formation of the field. As values shifted considerably in the twentieth century, they formed a catalyst—or are perceived to form a catalyst—for the main theoretical movements influencing American literary scholarship. Although New Critical methodology was quasi-scientific, introducing a focus on the literary object through the method of close reading, its theoretical expressions encouraged severing the text from life and history, in the process reifying nineteenth-century spiritual values through insistence on the irreducibility of the organically unified work. In reaction to New Criticism's isolationism, approaches in the seventies were influenced by sociopolitical movements, including

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Marxism, feminism, postcolonialism, and, slightly later, ecology. Concurrently, those approaches inspired by structuralism and poststructuralism particularly stressed the power of language and discourse. Yet in spite of this renewed connection between literature and the social sphere and the emphasis on its linguistic medium, in recent decades literary studies has continued to drift toward the margin of the academy.

The dominance of values as a motivating factor for theoretical and critical developments also harks back to institutional origins, because it derives from nineteenth-century ambivalence about the place of science in the humanities. This ambivalence, and its fundamental expression in the culture wars, has not been kind to literary studies.[2] Cast as the competitor to poetry by the Romantic era, science focuses on different objects from literary studies, and thus might likely require different methods and goals, but this is no reason to assume that verified scientific findings have no epistemic legitimacy in the humanities. In fact, some of these findings have direct bearing on the question of literature's use or function.

Because literature and the other arts are highly complex cultural products, their potential for various legitimate uses is great. For present purposes, I will narrow my discussion down initially to a consideration of the evolved function of art, because attention to the origins of a phenomenon typically illuminates the question of its use. Furthermore, because evolutionary social science is specifically concerned with the function of traits, it compels us to ask: why do we have literature at all? The theory of evolution by natural selection is corroborated by fossil findings and the study of living organisms. Not all evolutionary hypotheses can be proven, or proven easily, such as those that apply to mind, complex behaviors, and cultural artifacts, for which there cannot be hard evidence. But the framing hypothesis for these more speculative investigations is quite robust. Concerned with survival, evolutionary theory focuses on the functional value of species traits, since organisms that have the physical, psychical, and behavioral traits "designed" to help them operate efficiently in their environments will endure. Traits that require significant investments of time and physiological effort, such as bipedal locomotion, are "expensive" in evolutionary terms, and the puzzle of their selective advantage is particularly intriguing. Art behaviors, such as the production, distribution, and consumption of literary artifacts, are enormously expensive. Most evolutionary scholars take the view that, given their costliness, the arts must contribute to human survival, although a few propose that art is a by-product of other mechanisms and behaviors.[3]

If the arts have contributed to human survival over the course of evolution, it is likely that they still do so, and if they have had such a

fundamental role in the shaping and continuity of our species, then the marginalization of literature and other arts today seems grotesquely ill-advised. My argument for the central importance of the arts in human cultural evolution has several stages. Although critics in the past two centuries have argued over the usefulness of literature, the longer critical tradition evinces a persistent concern with the pragmatic function of literary art. Attention to the prehistory of aesthetic practices reveals that such consideration of function is well placed. The arts, in all their diversity of forms, are not mere ornaments braided into the evolution of human culture. Rather, they are a central feature of the psychological forces propelling its development. Notwithstanding shifts in what constitutes "art" and its role in social life since the advent of modernization, both the core features and the experience of the aesthetic remain surprisingly consistent throughout human prehistory and history and manifest themselves as a distinct, special form of the impulse shaping culture: the need to control experience as opposed to being acted upon by external circumstances. Written literature, compared to the other arts, is an extremely recent phenomenon, and it attests to the generalized need to shape and control that marks all art. But it is also much more than this. As text or film (in book, electronic form, or visual media) stored and available for retrieval outside the brain, it is a special contribution to external memory and extended mind, one that functions to engage us with imaginative interpretations of an ever more complex reality.

I

Apprehensions about bringing a scientific perspective to bear on the arts have several dimensions. There is, for example, the fear that a history of applying scientific knowledge to industrial production, which emerged about two hundred years ago with utilitarianism as both an organized philosophy and emergent cultural attitude, necessarily entails superimposing a mechanistic notion of "utility" on all forms of human endeavor. A rationalistic concept of "use" inevitably leads to a crude rather than clarifying reductionism, so anxieties that an evolutionary perspective will diminish the arts are hardly trivial.[4] However, by broadening our view of terms like "function" and "use" beyond a limited, rationalistic framework inherited from the Enlightenment, I hope to show that a cognitive-evolutionary perspective illuminates the significance of art behaviors. Whereas utilitarian philosophy and much Enlightenment science are inimical to such behaviors, which can only

seem superfluous from a rationalistic perspective, the Enlightenment also led paradoxically in an opposite direction, away from reductionism and toward a recognition of the operations of chance, complexity, and the interrelatedness of phenomena embodied in the theory of evolution by natural selection.

The function or use of literature has, in fact, always been a matter of primary concern within the critical tradition. In *The Mirror and the Lamp*, his seminal 1953 study of the critical tradition, M. H. Abrams identifies four dominant coordinates of art criticism—the universe, the audience, the artist, and the work—each corresponding to a particular theoretical emphasis.[5] As Abrams demonstrates, although individual theories may be placed clearly within one of the four basic categories corresponding to these coordinates—mimetic, pragmatic, expressive, or objective—no theory or critical approach resides purely within one of the four groupings. Each basic tendency is historically related to the other three and conditioned by the emphases of preceding theories. Moreover, the internal dynamics of any given theory typically account for all four coordinates to a certain degree. For instance, although Abrams categorizes Samuel Johnson's theory as predominantly mimetic and William Wordsworth's as expressive, he points out that the Romantic poet "was quite in agreement with Johnson that the poet properly concerns himself with the general and uniform elements, passions, and language of human nature; he merely differed in regard to the place these qualities are best exemplified in real life."[6] Despite divergent views about what is the proper object of imitation, and despite an orientation toward other coordinates of art behaviors, then, both theories have a recognizably mimetic component.

By the same token, although Wordsworth and other Romantic-era poets champion the role of the poet, they generally do so with the ultimate goal of producing (or reproducing) a specific effect on the audience.[7] Since Abrams defines a pragmatic theory as one that "looks at the work of art chiefly as a means to an end, an instrument for getting something done, and tends to judge its value according to its success in achieving that aim," it might be argued that this typifies Wordsworth's approach as well as Johnson's.[8] The goal or aim of aesthetic engagement, in other words, is a primary concern of early criticism. On the whole, the emphasis on the poet-as-legislator in Romantic theory led critics to mistakenly assume that the movement endorses subjective expression, "the spontaneous overflow of powerful feelings," for its own sake.[9] However, an attentive reading of Wordsworth's discussion of the process of poetic production reveals that the emotions to be expressed are of value because of their universal importance, determined by a poet who has

experienced them repeatedly and"[has] thought long and deeply," and, moreover, that the subjects and feelings manifest in the work of such a meditative poet are valuable for their capacity to transform the reader. Thus, as the poet creates poetry by associating current feelings with the ideas resulting from past feelings, "[he] shall describe objects and utter sentiments of such a nature and in such connection with each other, that the understanding of the being to whom [he addresses himself], if he be in a healthful state of association, must necessarily be in some degree enlightened, his taste exalted, and his affections ameliorated."[10] Wordsworth's emphasis on the reenactment of the poet's psychological process in the reader, in sum, is of a piece with his insistence that the poems he presents have a "worthy purpose," and it is therefore in its own way no less aimed at educating the reader than are neoclassical perspectives, though the methods of poetical instruction take different form. The poet's stress on psychological process and shaping of the human psyche as a pedagogical tool—his practice of teaching by indirection—parallels the rise of psychology as a discipline and simultaneously illustrates a modern understanding of how people learn.

All told, granting the differing orientations in aesthetic theories from the classical tradition onward, pragmatic considerations nearly always come into play. For example, underlying much of the debate about duration and unity of the work from Aristotle up through the eighteenth century are differing views of the impact on the audience. Aristotle's preference for tragedy's shorter span in comparison with the epic and his approval of the unities was undergirded by a conviction that drama's cohesive structure produces catharsis, which leads to the ennoblement of the individual. Horace turned Aristotle's observations into rules for writing, heightening the emphasis on instruction implicit in the *Poetics*. Similarly attending to the net effect on the audience, Sidney disparaged sixteenth-century England's bastard form, the "mingled drama" (tragicomedy), claiming that the combination of comedy, focused on the common errors of human life, and tragedy, focused on the uncertainty of human life and invoking admiration and commiseration, produces laughter rather than delight. Seventeenth and eighteenth-century English critics, although influenced by Pierre Corneille's rule-oriented sense of decorum, relaxed the strict didactic perspective that tied moral instruction to classical unity. For instance, Dryden's criticism that the unity of place destroys verisimilitude signals a turn away from the rules-and-models aspect of classical theory and presages Johnson's emphasis on the representation of truth through general nature and variety, which he deems conducive to the audience's moral growth. Different though the tenor of the Romantic era may be, Shelley's insistence that poetry

transforms the reader through sympathetic identification with other persons underscores a particular impact on the reader, the transformation of social consciousness.

In the instances cited above, how the audience is affected and what ends are served by the purported effects proves a dominant concern of the critic. This pragmatic strain throughout the critical tradition, aligned with Abrams's second coordinate, the audience, takes new form with the rise of literacy and psychology. Perhaps already emergent in Dryden's preference for verisimilitude, an emphasis on internal audience processes gains force in the Romantic era. In the first half of the twentieth century, the Russian formalist Shklovsky focused on the psychological impact of unusual techniques. And reader response theory takes on new permutations by the late twentieth century, when scholars like Reuven Tsur and Mark Johnson draw on cognitive and evolutionary psychology to explain the processes and possible functions of literature. Today, a number of cognitive evolutionary theorists assume a continuity between the cognitive processes entailed in, and the evolved function of, literature, for the simple reason that basic mental processes must adequately fit the goal of long-term survival.[11] In sum, a cognitive-evolutionary framework is a contribution to the evolving pragmatic strain of criticism and theory, connecting internal reader processes with larger hypotheses about the function of art at the species level.

II

For several reasons, formulating an evolutionary hypothesis about the adaptive function of the arts cannot be a simple business. Evolutionary psychology distinguishes between ultimate and proximate causation, that is, between the presumed cause of an adaptation in the distant past and factors in the current environment that elicit behaviors reflecting that adaptation.[12] When human settlements took root about 10,000 years ago, the advantages and demands of sedentary life accelerated the growth of human culture and led to a major, long-term transformation of human lifeways. In cultural terms, this transformation to modernism was gradual, but in evolutionary terms, it was very rapid indeed. Because our contemporary manner of living differs so dramatically from that of our ancestors as recently as 30,000 years ago, the original and contemporary causes of art behaviors are likely to differ.[13]

This discrepancy is especially evident when one considers the range and kinds of behavior that are included under the rubric of art. Modernized human cultures separate the experience of art—art products and the

behaviors they involve—from day-to-day activities, locating them in the theatre, the art museum, the opera house, the symphony hall, the dance hall, the work of imaginative literature, and so on. Within these various arenas, the arts are experienced as activities distinct from those perceived to contribute directly to survival. Even today, however, the practice of setting artifacts aside for special contemplation, a development of the past one thousand years, is confined to very few societies worldwide.[14] By contrast, our species, *homo sapiens sapiens*, dates to roughly 100,000 years ago, and estimates of the explosion of human culture pinpoint the Middle to Upper Paleolithic Age, between 60,000 and 30,000 years ago.[15] Over the tens of thousands of years that witnessed the development of human culture, art behaviors were not cordoned off into spheres removed from everyday, instrumental activities, but were engrained in other aspects of human life.

Thus, an evolutionary hypothesis about the emergence of the arts—that is, their ultimate cause—must attend to their integral relationship to the development of culture. More crucially, such formulations must consider whether the patterns of making and experiencing that constitute "the aesthetic" encouraged and accelerated cultural evolution as a response to problems of survival. If, as the cognitive psychologist Merlin Donald defines it, culture is "a collective system of knowledge and behavior" that includes ideas, beliefs, myths, artifacts, and institutions, and if we agree with those anthropologists and archeologists who identify many prehistoric cultural forms as art, then the inextricability of art with belief systems, ideologies, and modes of knowing and doing stands in relief.[16] Some of the best-known material examples of early art include body adornments, among them beads (some of those found in France were carved to mimic sea shells), animal teeth, and pendants, dating to 40,000–30,000 years ago; the paintings in Chauvet Cave in the Ardèche (30,000 years); the lion-man figurine found in Germany (33,000–30,000 years ago); the Lascaux Cave paintings (17,000 years); painted slabs in southern Africa's Apollo Cave (27,500 years ago); and wall engravings in Australia, dating at least to 15,000 years ago, but perhaps as much as 40,000 years old.[17] Additionally, there is abundant evidence of nonmaterial art forms in ritual activities (protomusic, protodance, and, eventually, myth), which were combined in holistic, ritual performances rather than segmented into separate aesthetic media.

Steven Mithen claims that although evidence of early art appears to be more prolific in Europe than elsewhere, it is a worldwide phenomenon at this period in human prehistory. Explaining why art remains absent in some parts of the world until about 20,000 years ago, Mithen writes: "The variability in the intensity with which art was produced can

be attributed to variation in economic and social organization, which in turn can be largely attributed to environmental conditions. The archaeological record shows us that Stone Age art is not a product of comfortable circumstances—when people have time on their hands; it has most often been created when people were living in conditions of severe stress. The florescence of Paleolithic art in Europe occurred at a time when environmental conditions were extremely harsh around the height of the last ice age."[18] Evolutionary, cognitive, and environmental psychologists generally concur with Mithen's claim that aesthetic phenomena are not related to leisure time but, to the contrary, to stressful conditions. If cave paintings were a way of storing information about sources of food or rival human groups (a primary source of stress), body adornment may have functioned to disseminate messages to such groups, perhaps misleading ones. Mithen theorizes that three cognitive capacities, related to three domains of mind, are critical for the creation of art: the mental conception of an image, intentional communication, and attribution of meaning. The emergence of art attests to a transformation in human cognition, a "cognitive explosion" in early modern humans 60,000–30,000 years ago.

The view that art is a response to challenges to survival harmonizes with Donald's as well as other definitions of the more inclusive term "culture." The environmental psychologists Stephen and Rachel Kaplan define culture as a set of consistent patterns for functioning that arises from the need to control individual and group life and the surrounding environment. Culture is, then, "a collective system of knowledge and behavior" that, as Donald emphasizes, functions to extend cognitive power and lessen the power of our immediate environment. A cultural context does not simply help solve a problem; it helps define the problem and shape its solution, providing a coherent understanding and set of relationships to other people, physical place, and the larger world. As the Kaplans put it, culture is a map for healthy functioning.[19] This line of thought, then, suggests that culture is much than the product of a large brain that frees humans from the demands of a delimited habitat and immediate circumstances. Viewed from an evolutionary perspective, culture is about enabling control and/or the perception of control, thereby also increasing the plasticity of human response. Notably, culture is shot through with aesthetic behaviors. Early aesthetic behaviors include primitive myths and rituals which, in this light, provide a perception of control and explain what is fearful.

Like these general definitions of culture as a collective system of knowledge and behavior that constitutes a map for functioning, evolutionary definitions of "art" and "the aesthetic" emphasize that art is a mode of

action rather than a series of categories of artifacts. The most dedicated advocate for an evolutionary definition of the arts, the anthropologist and art historian Ellen Dissanayake, pointed out in 1988 that it might be worthwhile to abandon the term "art" altogether, because this word is tied to an artifact-centered approach. Drawing on recent cognitive science and philosophy, Dissanayake notes that because classes of things don't have precise boundaries, the quest to define essential features of art phenomena is doomed to frustration.[20] Dissanayake defines art as "making special," or elaboration beyond the everyday. The human need to elaborate beyond, not merely to explain, the everyday imposes a human and civilizing order on nature.[21] By doing something that creates the psychological perception of control, art allays anxiety in uncertain circumstances and facilitates group cohesion (although this social function may be reduced, masked, or negated in the atomized world of modern art practices).

Thus, like the philosopher Denis Dutton, Dissanayake rejects the notion that the origin of the arts requires the separation of ancient and folk art behaviors from a modern conception of art. In recognizing difference but stressing continuity, both Dissanayake and Dutton identify features of art and the aesthetic that they deem key to any efforts to define art. Dissanayake itemizes several naturalistic features of aesthetic quality, including accessibility coupled with strikingness, tangible relevance, evocative resonance, and satisfying fullness.[22] Dutton enumerates cross-cultural features that "define art in terms of a set of *cluster criteria*," most of which apply to the practices and objects identified as art. Dutton's list is significantly longer than Dissanayake's, but the two lists exhibit marked similarities. Dutton includes direct pleasure, skill and virtuosity, style, novelty and creativity, criticism, representation, special focus, expressive individuality, emotional saturation, intellectual challenge, arts and institutions, and imaginative experience.[23] Both theorists attend to the distinctive features of the art object or event as well as the nature of the experience it produces. In these accounts, art reveals itself as a constructed thing that creates novelty and strikingness through selection from the everyday. Art or "making special" is not directly instrumental, like digging a trench to prevent flooding inside a settlement or fashioning a better weapon, but psychically functional, its evocative concentrations of form and style productive of a special emotional response that is often complemented by criticism and intellectual engagement. Finally, in all times and places, art behaviors and objects have been part of larger social institutions and practices.

According to this concept of the arts, which maintains that they are part of the mental and material apparatus enabling action and control of

the immediate environment, the aesthetic is fundamentally continuous with other forms of human experience. The orientation toward continuity rather than strict demarcation between behaviors and categories coincides with a larger epistemological shift that emphasizes process rather than categorization and static hierarchy.[24] The transition to a dynamic conception of the universe begins in philosophical and scientific thought in the eighteenth century, but it gains momentum with the emergence of Darwinian theory, which, in surmounting earlier evolutionary theories of life through the concept of natural selection, envisioned descent with modification as an extraordinarily slow process taking place over vast spans of time. Darwin himself points out that the distinction between species and variety, although essentially arbitrary, is employed for the sake of convenience in grouping similar individuals with one another.[25]

The theory of evolution by natural selection profoundly influenced American pragmatic philosophy, leading William James and John Dewey to criticize the compartmentalization to which intellectual inquiry is so often prone.[26] Nevertheless, while pragmatists were criticizing the psychological fallacy—that of superimposing discrete functional capacities on the mind and segmenting reality into identifiable components such as subject, object, and stimulus—the discipline of psychology proceeded to develop a stimulus-response model of perception and sensation. (After all, phenomena are more amenable to analysis when they are broken down into component parts, even when those components reflect the thinker's own perceptual-cognitive apparatus rather than mind-independent entities.) Ecological psychology emerged in the 1960s as a critical response to this trend, claiming that perceptual acts can only be understood in the context of the environment, and that the senses operating together form a perceptual system designed to orient the organism in the environment and facilitate information pick up. Thus, J. J. Gibson's theorization fifty years ago of the relationship of perceptual systems to the constraints of the environment serves as a precursor to today's embodiment psychology, which recognizes that mental processes are in many ways organized and governed by physical patterns of action and applies neuroscientific methods to investigation of body-mind processes.[27]

John Dewey provides an important link between a post-Enlightenment epistemology that envisions intellectual inquiry in terms of continuity and process and a functional definition of the aesthetic. Whereas experience in general is a continuous process, in Dewey's estimation, "an experience has a unity that gives its name, *that* meal, that storm, that rupture of friendship. The existence of this unity is constituted by a single *quality* that pervades the entire experience in spite of the

variation of its constituent parts."[28] Going a step beyond the completed unity of an everyday "experience," Dewey defines "the aesthetic" as the clarification and intensification of an ordinary completed experience and contends, furthermore, that not only art behaviors but intellectual experiences can have an aesthetic quality. Both are subject to an internal integration and fulfillment based on movement or aesthetic structure. But the arts also differ from a completed, everyday experience. For example, watching a spectacular sunset provides a sense of unity and completion, but this experience has not been intentionally shaped with the goal of eliciting aesthetic response, as has a work of art. In Dewey's words, "The doing or making is artistic when the perceived result is of such a nature that *its* qualities *as perceived* have controlled the question of production."[29] And although intellectual experience may be subject to such intentionality, it works with abstract signs and symbols rather than perceptual qualities, as do the arts.

III

The arts are, then, intentionally elaborated behaviors that, via some kind of product, provide "an experience" through emotionally evocative stylizations (of visual pattern, rhythm and sound, bodily movement, language use, and the like) that reward both creator and participant with a perception of control through the combination of accessibility, novelty, and completeness.

In their many instantiations in human prehistory and the present, the arts take a variety of distinctive forms. Written literature has several unusual characteristics, not least its removal from sense experience. Vision and sound are perhaps the senses chiefly engaged in the experience of the arts, but literary works read silently engage primarily with memory rather than linking directly to the senses themselves. Several features of literature suggest that, if it still serves an evolved function, that function is highly cognitive: its distance from sensory experience, its correspondingly abstract, cerebral nature, and its mediation through the complex symbolic system of written language.

Viewed as a representative type of art behavior, written literature, an extremely recent and cognitively demanding medium, illustrates the futility, or perhaps simply the wrong-headedness, of trying to pinpoint an ultimate cause for any specific art behavior or object above and beyond the propensity to elaborate or "make special." All of the arts attest to the human impulse to resist subjection to external circumstances and to occupy instead what John Tooby and Irven DeVore call "the cognitive

niche." This metaphor—the cognitive niche—highlights how the human development of culture, our "collective system of knowledge and behavior," differentiates us from other animal species. Whereas most animal species carve out ecological niches by adapting to distinct habitats, learning to exploit resources and cope with predators in physically delimited domains, the greater mobility and intelligence of humans that emerged several million years ago freed them from the known threats in and dependence on a geographically defined habitat. Able to apply intelligence to a changing physical surround, humans learned to turn the unfamiliar to good use, crafting their niche in diverse places via the benefits of their analytical, interpretive minds.

The emergence of symbolic systems about nine thousand years ago marks, in Donald's assessment, a major advance in human cognition. From the simplest markings on rocks to written text to high-speed computers, humans have created stores of knowledge and information outside the brain that greatly enhance use of the environment because they solve the problem of limited short-term memory. Knowledge outside the brain is stored in the external symbolic storage system (ESS) and constitutes "external mind," that is, a nonbiological extension of human mind into the external environment. Donald claims that the symbol systems and storage devices of our stage of culture introduce "a *hardware* change, albeit a nonbiological hardware change" in human memory. If this claim seems grandiose, imagine trying to function without the ESS. Phonetic handwriting, pads and pencils to store that handwriting, computers, electronic tablets, telephones—these comprise today some of the more obvious forms of external memory. But how would we function without streetlights, street signs, traffic signs, and the symbols and words in grocery stores and malls, all of which are components of the ESS? Before the development of symbolic systems, external memory was extremely limited, including cultural memories "stored" in other persons, early arts, trail markings, and so on. The increasing complexity of the ESS is evident in the sophistication of a government document, a legal brief, or, indeed, a work of literature. Like other documents that benefit from the development of phonetic writing, literature attests to the expansion and externalization of the mind and at the same time augments a very special kind of mental hardware outside the brain.

What distinctive features of human evolution brought about the development of complex culture, including the impulse to elaborate beyond the everyday that would, over time, issue in a specific artworld comprised of distinct aesthetic media, all attesting to the efflorescence of external (or extended) mind? Bipedalism, expansion of group size, increase in territory, sociality, high intelligence, meat eating, and, finally,

the development of complex language are all dynamically related components of the evolution of a species that has learned to use mind and the products of mind to make its place in the world. Perhaps the single most important adaptation, bipedalism provides benefits and exacts costs that drive the evolution of other features of modern humans, including increased body, brain, and group size. Outlining Peter Wheeler's hypothesis that bipedalism evolved to reduce heat stress, Robin Dunbar points out "that a hairless, bipedal, sweating hominid could have doubled the distance it travelled on a pint of water compared to a furred quadrupedal one."[30] To the layman, this might sound like a simple savings in energy and resources but, in fact, in evolutionary terms, it has major implications, since travelling further means confronting the unfamiliar which, in turn, demands increased intelligence. Probable migrations of *homo erectus* from Africa and Java into Asia almost two million years ago point to the integral relationship between bipedalism and higher intelligence. Occurring over vast periods of time, these migrations indicate that individual generations of human ancestors were expanding their territory size incrementally and repeatedly relocating into more habitable areas. Therefore, two million years ago humans were reaping the advantages of bigger brains: with the brainpower to coordinate the complex mechanics of bipedal bodies and the attendant ability to travel beyond delimited habitats, early humans had begun to occupy the "cognitive niche," adapting to new locales by taking advantage of unfamiliar resources and protecting themselves against new threats.

Although some late twentieth-century literary theoreticians posit the all-encompassing power of language, the supposition that language precedes thought and perhaps determines it is fundamentally contradicted by the evidence of evolutionary social science. As Donald reasons, significant cognitive and cultural changes likely provided the impetus for language's evolution: "the main importance of the vocal apparatus does not reside in how it might have enabled speech; in itself, it couldn't have. . . . The accompanying conceptual changes are more basic, and even these formed only part of a larger cultural change."[31] Moreover, the dramatic physiological changes necessary for language did not emerge under pressure for its evolution, but were probably a side benefit of the adaptation for bipedal anatomy.[32] Upright posture caused the lengthening of the vocal tract with the lower positioning of the larynx, consequently enabling increased versatility in vocalizations. Donald contends that "The primary objects of language and speech are thematic; their most salient achievements are discourse and symbolic thought. Words and sentences, lexicons and grammars, would have become necessary evils, tools that had to be invented to achieve this higher representational goal. In this view, language would have repre-

sented not an end in itself but an adaptation that met cognitive and cultural needs, that is, ultimately for the formalization and unification of thought and knowledge."[33]

In sum, Donald suggests that it was the cognitive drive toward representation and myth formulation that spurred the evolution of language. Mythic representation initially functioned to explain the organization of reality, including not only questions of origins but the causes of unpredictable and disastrous events. In drawing the human group together by explaining uncertainty, myths addressed the problem of survival and, in so doing, consolidated the group through a story that gave a sense of psychological control over the environment to individuals as well as the group as a whole.

IV

The complexity of human biological and cultural evolution supports the position that a narrowly instrumental view of art is not in keeping with an evolutionary perspective, much less with contemporary uses of the arts. According to the evolutionary hypothesis presented here, art emerged to provide a psychic sense of control and group cohesion in uncertain circumstances. In my view, this sense of control, often imparted through pattern and immersion in what Dewey identifies as an intentionally designed, completed experience, is still a seminal aspect of aesthetic experience.[34] But this is a far cry from boiling all of art's functions, not to say its uses, down to a perceived control over experience. Art participates in culture, and if culture is "a collective system of knowledge and behavior" that provides "a map for healthy functioning," that map is necessarily a generalized one that incorporates signposted alternative routes and unmarked trails along with its conventional paths. That is to say, in keeping with the plasticity of mind that emerged as humans began to craft the "cognitive niche," freeing themselves from the vagaries of the environment, the pattern of human evolution predicts a movement toward independence of mind and hypothetical thought. Furthermore, the ESS, which fundamentally enhances human mind by documenting independent thought and transforming it into shared information, is the cultural-technological ground zero of written literature. Nonexistent outside of this storage and retrieval system, literature not only relies on but amplifies it. Its special use, therefore, is in its function as both an extension of and contribution to mind, one that expands our capacity for narrative and metaphorical thought, that augments consciousness, and that offers hypothetical, interpretable experience.

Donald claims that with the developments of reading and film, the mind comes under the control of the ESS: "biological memory is, more and more, unable to draw on its own experiences without reference to the ESS."[35] Without symbolic systems, the constraints of short term memory, even allowing for enhanced memory through the shared, mutually supporting structures of human social groups, limit prospective and retrospective thought. The increasing refinement and sophistication of early symbolic systems over about eight thousand years ultimately led to alphabetic writing, which unites auditory and visuographic cognitive processes. Donald suggests that pictorial representations gradually evolved into symbols about 8,500 BC in Sumeria. Early symbolic systems, including accounting systems, lists, and syllabaries (loose collections of symbols), remained visuographic for many thousands of years, lacking any correlation with the spoken word. These systems, which required the memorization of large numbers of symbols, put a high demand on memory, inevitably limiting literacy and discouraging creativity among those who used them. The invention of alphabets thus constitutes a major breakthrough, for alphabetic writing combines visual symbols with phonetic expression, utilizing a limited number of symbols that are capable of expressing and storing a broad array of meanings.

Thus, phonetic language and, in time, the printing press, provided the necessary technology for literary production. However, the cognitive capacities underlying the techniques most central to literature, such as figurative expression (including metaphor, metonymy, and synecdoche) and, most centrally, narrative, are not products of the invention of writing and speech but long predate them.[36] Narrative is a primary, indispensable, and very ancient mode of thought, directly connected to causal inferencing. In psychological terms, the ability to place persons, objects, and events in sequences and to infer causal relations constitutes narrative cognition.[37] Literary theorists might argue that this sort of day-to-day narrativity, whereby we walk ourselves through our days—construing our work and social activities, our family obligations, our negotiations of the roadways and the swimming pool lanes, our conflicts with coworkers, our future plans, our memories—that this loose and free-form story-making, with so many overlapping strands, has little relation to what literary scholars mean by "narrative." But literary narrative entails the selection and/or invention of strands of thought-and-action from this web of ongoing narrativity. Literary narrative is not separate from, or other than, the commonplace narrativity that facilitates our understanding of ourselves, others, and events and that enables us to conceive of ourselves and to behave as agents. Literary narrative is the aestheticized refinement of the web of everyday narrativity, and it is capable of an

extraordinary "making special" and an extension of mind because it is embedded in the ESS.

Furthermore, because the ESS enlarges the human mind beyond the limits of the physical brain, it likewise supplements and extends consciousness, a process that also relies on narrative cognition. As the most basic definitions of consciousness reveal, it is entwined with an organism's relations in time and space, and thus with contiguity and causality, the backbone of narrative. In the simplest terms, Antonio Damasio defines consciousness as "an organism's awareness of its own self and surroundings" or "a unified mental pattern that brings together the object and the self."[38] Musing on the origin of consciousness, Damasio links it with primal forms of narrative thought: the organism "[constructs] an account of what happens within the organism when the organism interacts with an object, be it perceived or recalled, be it within body boundaries (e.g., pain) or outside them (e.g., a landscape). This account is a simple narrative without words."[39] Thus, the impulse behind the emergence and persistence of consciousness in the species—to construct a sequential and causal understanding of self-and-environment—appears closely related to the strong evidence of narrative thought and action in literature.

Recently, several evolutionary and cognitive theorists have highlighted an important function of literature, maintaining that narrative simulations provide practice for real-world experience. For instance, the adaptationist literary scholar Joseph Carroll, building on the speculations of evolutionary biologist E. O. Wilson, proposes a general theory of art around the concept of scenario building.[40] Along the same lines, Lisa Zunshine insists on the cognitive efficacy of reader projection into hypothetical situations, emphasizing particularly that fiction hones the ability to glean the beliefs, intentions, and desires of others.[41] For example, following Carroll's theory, Pat Barker's *Regeneration Trilogy* strengthens and diversifies neural networks via simulated experience of soldiers in World War I and the doctors who treated them for shell shock. These neural networks attest to the diversification of cognition via hypothetical experience. Following Zunshine's theory, the conversational niceties in Jane Austen's novels allow readers to infer the intentions and beliefs of characters and in the process attune their understanding of the minds of real persons.

In my view, both theorists point to an important (though not the only) function of literature in the present day, one that, while not directly instrumental, is highly useful. Because literary works are intentionally constructed experiences, they enable readers to engage from a distance and thus to reflect on events and character psychology from a position of security. If the evolved function of primitive art was to ensure a sense

of security and control over experience, then this aspect of art's ultimate cause persists in the immersion in imaginative worlds, which allow us to extend consciousness by drawing on domains where we lack direct experience. Additionally, the likely cognitive process that facilitated human control over the environment harmonizes with the theories of Carroll and Zunshine. Planning and goal-oriented action are signature features of entry into the cognitive niche, for they are evidence of prospective and retrospective thinking rather than responses based on immediate conditions alone. Tooby and DeVore maintain that humans became capable of performing goal-oriented actions "by *conceptually abstracting from a situation a model.*"[42] For example, early humans who remembered patterns of animal migration or feeding routines learned to place these in a hunting situation model; abstracting from that model, they were able to act on it pragmatically (when animals moved toward the water hole at dusk, for instance). In developing situation models, in short, humans draw on experience-based knowledge and organize it in rudimentary narrative form. These models, in turn, are cognitively available as flexible plans for immediate or prospective action. It seems quite likely, then, that the cognitive skill and complexity brought by higher cognition ultimately resulted in the evolution of fictional, "as if" mental products, situation models at a mental remove from reality.

Indeed, evolutionary psychology offers an adaptive explanation for the emergence of imaginative experience and its indirectly instrumental status, and this too lends weight to the view that literary experience hones cognitive understanding and may, in some cases, be practically applicable. Leda Cosmides and John Tooby propose that as our human ancestors came to inhabit the cognitive niche and simultaneously confronted the complexities of a changing environment, they needed to sort globally true from contingently true information, and they needed to reason counterfactually. (It is globally true that all animals die and rain makes you wet, but only contingently true that small purple-blue berries are a good food source. It might be true that if your group had traveled through the woods rather than skirting them, you would have saved yourselves from overexposure but taken on the risk of unknown dangers.) Cosmides and Tooby suggest that humans developed the cognitive ability to track true and false information separately, concomitantly surrendering a naïve realism. In their words, "Managing these new types of information . . . involved the evolution of new information formats . . . [and cognitive tagging and tracking of] the boundaries within which a given set of representations can safely be used for inference or action."[43] Whereas oral literature is a relatively simple extension of this cognitive apparatus for simulation, written literature is a quite elaborate extension of it.

As the above remarks suggest, theories of literature as scenario building and mind reading have much to offer; however, by themselves they are biased toward narrative forms and may also tend to literalize the operations of imaginative texts. The technical ability to encode and store linguistic constructs results in an endgame with language and form and indicates these theories do not cover all the bases of literature's evolved function. A fascinating irony of written literature is that, once words are fixed on the page—and thereby entered into the ESS—they are open to inspection and interpretation. Paradoxically, as words become set in stone, so to speak, their recorded nature lends itself to a proliferation of meaning and, in relatively short order, to the construction of new kinds of texts whose authors intend a proliferation of meanings. At first blush, this might all seem rather unnatural from an evolutionary perspective. How can such apparently superflous complexity issue from an evolutionary function? An organism must make a ready assessment of its environment and take prompt action. Has a cultural artifact that revels in interpretive ambiguities severed itself from human nature and the evolved function of the arts?

Everyday living is an interpretive process, and both in the present and past it presents us with ambiguities. Literary scholarship has been hindered by the assumption that meaning-construction is essentially textual, rather than a fundamental life process that we, to borrow Dissanayake's terms, make special or elaborate in literary texts. This belief is, to a great extent, understandable. Because humans in general, like other organisms, are better served by directing their attention outward than inward, they are generally not conscious of being continuously engaged in meaning-making processes. In the interests of survival, as neuroscientists and philosophers recognize, perception, cognition, and consciousness are predominantly directed away from the self.[44] Additionally, literary scholars in particular are apt to think of meaning as solely a feature of language, a technology that can both clarify and complicate semantic procedures. Be that as it may, the construction of meaning is a routine matter. Noting the movements of the ceiling fans on my balcony, the quivering magnolia branches outside my window, and the telltale sheen in the sky, I infer (without turning on the television to confirm my meanings) that Tropical Storm Karen has approached the Gulf Coast.

As humans entered the cognitive niche and untethered themselves from the features of delimited locales, they needed to construct new meanings from the aspects of unfamiliar environments. Thus, over the course of human evolution, the increasing complexity of meaning-construction proceeded hand-in-hand with the emergence of higher intelligence. One great advantage of imaginative literature is that invites

our powers of meaning construction in a safe domain that allows our interpretive powers to range freely. But more than this, imaginative literature makes us conscious of what we automatically tend to forget: that we are active interpreters of that reality, and that we normally enlist cognitive procedures that have a general, but certainly not a comprehensive, efficacy.

If art is a mode of action that evolved under challenges to survival, the abstract nature of written literature constitutes an aesthetic form suitable to the complexity of human experience under modernization. Developing as an integral aspect of culture, art offers, as Dewey suggests, intentionally constructed experience that results in a sense of completion. Conferring a sense of completeness and control, aesthetic experience offers a psychic arena where opportunities for meaning-making proliferate. This is perhaps particularly true of written literature, since the abstractions of language sever it from direct sensory experience, and since language is a symbolic system facilitating interpretive procedures. In light of Donald's speculation that language evolved for the unification of thought and knowledge, the use of literary forms to create complex significance—and thus to complicate thought and knowledge—suggests that a primary function of literature today is to prevent excessive unification of thought and knowledge, which cannot serve the needs of a complex culture.

Pragmatic theories traditionally have ethical implications, as Abrams's definition indicates: they "[look] at the work of art chiefly as a means to an end, an instrument for getting something done, and [tend] to judge its value according to its success in achieving that aim." An evolutionary approach to the function of art relieves the critic of the ethical focus indicated in the tradition, since it begins with a much more basic question: why do we have literature at all? My remarks in this essay point to functions that have transformed considerably in their entwined relation with evolving culture but that are still robust today. One *use* of literary studies, as opposed to literature itself, is to increase the efficacy of meaning-making processes and the conscious awareness of humans as interpreters of their reality by teaching a rich tradition of literary works and engaging in communal interpretation. We may even be able to convince some administrators that what is not directly instrumental is, nonetheless, a central feature of our species' survival.

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NOTES

1 Gerald Graff, *Professing Literature: An Institutional History* (Chicago: Univ. of Chicago Press, 1987), 20.

2 See C. P. Snow, *The Two Cultures* (Cambridge: Cambridge Univ. Press, 1998), for the origins of this debate.

3 There are notable exceptions. Steven Pinker proposes that the arts are "a by-product of three other adaptations: the hunger for status, the aesthetic pleasure of experiencing adaptive objects and environments, and the ability to design artifacts to achieve desired ends." See *The Blank Slate: The Modern Denial of Human Nature* (New York: Viking, 2002), 405. Jeffrey Miller maintains that the arts, like the peacock's tail and the bowerbird's nest, are features of sexual selection. See *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature* (New York: Anchor Books, 2002). Pinker's view that the arts are a by-product rather than an adaptation seems weakened by the very pervasiveness of art behaviors. Miller's theory is weakened by the implausible notion that art (in all its manifestations) is an efficient means of signaling a large brain and therefore sexual fitness.

4 For a discussion of the convergence of the rise of science with the institutionalization of literary studies that distinguishes the objects, aims, and methods of the humanities and sciences but provides an argument for the judicious application of scientific knowledge to literary study, see Nancy Easterlin, "Literature, Science, and Biocultural Interpretation," in *A Biocultural Approach to Literary Theory and Interpretation* (Baltimore: Johns Hopkins Univ. Press, 2012), 1–38.

5 M. H. Abrams, *The Mirror and the Lamp: Romantic Theory and the Critical Tradition* (New York: Oxford Univ. Press, 1953).

6 Abrams, *Mirror*, 107.

7 William Wordsworth, preface, *Lyrical Ballads: 1798 and 1800*, ed. Michael Gamer and Dahlia Porter (Peterborough, Ont.: Broadview Editions, 2008), 171–87.

8 Abrams, *Mirror*, 15.

9 Wordsworth, *Lyrical Ballads*, 175, 183.

10 Wordsworth, *Lyrical Ballads*, 175.

11 Studies exploring the evolved basis of literary reading and connecting it particularly to Shklovsky's theory of defamiliarization include, for example, David S. Miall, "An Evolutionary Framework for Literary Reading," in *Literary Reading: Empirical and Theoretical Studies* (New York: Peter Lang, 2006), 189–202; David S. Miall and Don Kuiken, "What Is Literariness? Three Components of Literary Reading," in "Empirical Studies of Literature: Selected Papers from IGEL '98," ed. David Miall, special issue, *Discourse Processes* 28, no. 2 (1999): 121–38; Nancy Easterlin, "'It Is No Tale': Narrative, Aesthetics, and Ideology," in *Biocultural Approach*, 39–89.

12 John Tooby and Leda Cosmides, "The Psychological Foundations of Culture," in *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, ed. Jerome Barkow, Leda Cosmides, and John Tooby (New York: Oxford Univ. Press, 1992), 19–136.

13 For a discussion of the first human settlements in the Fertile Crescent (the modern area comprised of Jordan, Israel, Palestine, Turkey, Iraq, and Syria) in the period of global warming during the retreat of the last ice age (20,000–10,000 BC), see Steven Mithen, *After the Ice: A Global Human History, 20,000–5,000 B.C.* (Cambridge, MA: Harvard Univ. Press, 2003). Although the general framework for the beginning of civilization is 20,000–5,000 BC, the earliest settlements did not last. The first settlements date to about 14,500 BC, and settled Natufian culture survived from 12,300–10,800 BC, but these groups ultimately reverted to a nomadic lifestyle as a result of climate change, overhunting of critical food sources, and other ecological effects.

14 Ellen Dissanayake, *What Is Art For*? (Seattle: Washington Univ. Press, 1988), 35, 41. Johan Huizinga, *Homo Ludens: A Study of the Play Element in Culture* (Boston: Beacon, 1950).
15 Steven Mithen, *The Prehistory of the Mind: The Cognitive Origins of Art and Science* (London: Thames and Hudson, 1996).
16 Merlin Donald, *Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition* (Cambridge, MA: Harvard Univ. Press, 1991), 148.
17 Mithen, *Prehistory*, 156.
18 Mithen, *Prehistory*, 156–57.
19 Stephen and Rachel Kaplan, *Cognition and Environment: Functioning in an Uncertain World* (New York: Praeger, 1982), 136–37.
20 Dissanayake, *What Is Art For?*, 58. In philosophy, Nelson Goodman is an early and influential precursor to Dissanayake's dynamic view of art, claiming that the aesthetic attitude is dynamic rather than static. See *Languages of Art: An Approach to a Theory of Symbols* (Indianapolis: Bobbs-Merrill, 1968), 241–42.
21 See, for instance, *What Is Art For?*, 74–78; *Homo Aestheticus: Where the Arts Come From and Why* (New York: The Free Press, 1992), 39–101; Ellen Dissanayake, *Art and Intimacy: How the Arts Began* (Seattle: Univ. of Washington Press, 2000), 134–45. Each of Dissanayake's books successively elaborates her primary thesis that art is elaboration beyond the everyday, or making special. For a discussion of all three books, see Nancy Easterlin, "Big Guys, Babies, and Beauty," *Philosophy and Literature* 25 (2001): 155–65.
22 Ellen Dissanayake, *Art and Intimacy: How the Arts Began*, 209–16.
23 Denis Dutton, *The Art Instinct: Beauty, Pleasure, and Human Evolution* (New York: Bloomsbury Press, 2009), 51–58.
24 For the seminal philosophical discussion of this transition in philosophical thought, see Arthur O. Lovejoy, *The Great Chain of Being: A Study of the History of an Idea* (Cambridge, MA: Harvard Univ. Press, 1964).
25 Charles Darwin, *The Origin of Species by Means of Natural Selection, or the Preservation of Favored Races in the Struggle for Life*, ed. and intro. J. W. Burrow (1860; Middlesex, UK: Penguin Books, 1968), 108.
26 For an excellent discussion of the influence of Darwinian theory on American pragmatism, see Louis Menand, *The Metaphysical Club: A Story of Ideas in America* (New York: Farrar, Straus and Giroux, 2001).
27 James J. Gibson, *The Senses Considered as Perceptual Systems* (Boston: Houghton Mifflin, 1966). For more recent work in ecological psychology, see, for example, Edward S. Reed, *Encountering the World: Toward an Ecological Psychology* (New York: Oxford Univ. Press, 1996) and Eleanor Gibson and Anne D. Pick, *An Ecological Approach to Perceptual Learning and Development* (New York: Oxford Univ. Press, 2000). For endorsement of an ecological approach from within philosophy, see Alva Nöe, "Conscious Reference," *The Philosophical Quarterly* 59, no. 236 (2009): 470–82 and "On What We See," *Pacific Philosophical Quarterly* 83, no. 7 (2002): 57–80. For Nöe's argument against the view that human knowledge is primarily propositional, see "Against Intellectualism," *Analysis* 65, no. 4 (2005): 278–90.
28 John Dewey, *Art as Experience* (New York: Minton, Balch and Company, 1934), 37.
29 Dewey, *Art*, 48.
30 Robin Dunbar, *Grooming, Gossip, and the Evolution of Language* (Cambridge, MA: Harvard Univ. Press, 1996), 108.
31 Donald, *Origins*, 212.
32 Mithen, *Neanderthals*, 212.
33 Donald, *Origins*, 216.
34 Evolutionary psychologist David C. Geary posits that the desire for control over resources and in social influence is an adaptive mechanism. In his words, "A fundamental motivation to control has evolved in humans and all other species because success at

achieving social influence and control of biological and physical resources very often meant the difference between living and dying or reproducing or not." See David C. Geary, *Male, Female: The Evolution of Human Sex Differences*, 2nd ed. (Washington, DC: American Psychological Association, 2010), 250–51. It follows from this that the perception of control over experience, both on the part of individuals and groups, has a highly adaptive psychological function.

35 Donald, *Origins*, 324.

36 Metaphor, metonomy, and synechdoche are elegant outgrowths of (elaborations of) the perception of physical relatedness and the capacity to draw associations and inferences. Genres like the lyric typically draw on these modes of cognition, but they inevitably have some narrative (temporal and causal) context, whether inferred or implied. Thus, although we tend to dichotomize narrative and lyric, the underlying cognitive modes evolved to facilitate information pick up and the projection of inferences into meaningful, narratively construed, action plans.

37 For discussion of the primacy of narrative mentation, see Jerome Bruner, *Acts of Meaning* (Cambridge, MA: Harvard Univ. Press, 1990); Dan Edward Lloyd, *Simple Minds* (Cambridge, MA: MIT Press, 1989); Roger C. Schank, *Tell Me a Story: A New Look at Real and Artificial Memory* (New York: Charles Scribner's Sons, 1990).

38 Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (New York: Harcourt, 1999), 4, 11.

39 Damasio, *Feeling*, 168.

40 E. O. Wilson, *Consilience: The Unity of Knowledge* (New York: Knopf, 1998). Joseph Carroll, "An Evolutionary Paradigm for Literary Study," *Style* 42, no. 2–3 (2008): 103–35.

41 Lisa Zunshine, *Why We Read Fiction: Theory of Mind and the Novel* (Columbus: Ohio State Univ. Press, 2006.)

42 John Tooby and Irven DeVore, "The Reconstruction of Hominid Behavioral Evolution through Strategic Modeling," in *The Evolution of Human Behavior: Primate Models*, ed. Warren G. Kinzey (Albany: SUNY Press, 1987), 209.

43 Leda Cosmides and John Tooby, "Does Beauty Build Adapted Minds? Toward an Evolutionary Theory of Aesthetics, Fiction and the Arts," *SubStance* 30, no. 94–95 (2001): 6–27, 20.

44 See for instance, Damasio, *Feeling*, 29, and Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding* (Chicago: Univ. of Chicago Press, 1987), 4–5.