

This work originally appeared in:
Dennett, Daniel. 1990. Memes and the Exploitation of Imagination. *Journal of Aesthetics and Art Criticism* 48(2): 127-35.

It is not available electronically from the publisher.

This is Daniel C. Dennett's final draft before publication. It has been modified to reflect the proper pagination of the published version of the work.

Mememes and the Exploitation of Imagination

By Daniel C. Dennett

The general issue addressed in a Mandel Lecture is how or whether art promotes human evolution or development. I shall understand the term "art" in its broadest connotations—perhaps broader than one normally recognizes. I shall understand art to include all artifice, all human invention. What I say will a fortiori include art in the narrower sense.

There are few ideas more hackneyed than the idea of the evolution of ideas. It is often said that schools of thought evolve into their successors. In the struggle for attention, the best ideas win, according to the principle of the survival of the fittest, which ruthlessly winnows out the banal, the unimaginative, the false. Few ideas are more hackneyed—or more abused. Almost no one writing about the evolution of ideas or cultural evolution treats the underlying Darwinian ideas with the care they deserve. I propose to begin to remedy that.

The outlines of the theory of evolution by natural selection are now clear. Evolution occurs whenever the following conditions exist:

- (1) variation: a continuing abundance of different elements
- (2) heredity or replication: the elements have the capacity to create copies or replicas of themselves
- (3) differential "fitness": the number of copies of an element created in a given time depends on interactions between the features of that element (whatever it is that makes it different from other elements) and features of its environment.¹

This definition, drawn from biology, says nothing specific about organic molecules, nutrition, or even life. It is a more general and abstract characterization of evolution by natural selection. As the zoologist Richard Dawkins has pointed out, the fundamental principle is "that all life evolves by the differential survival of replicating entities."²

The gene, the DNA molecule, happens to be the replicating entity which prevails on our own planet. There may be others. If there are, provided certain other conditions are met, they will almost inevitably tend to become the basis for an evolutionary process.

But do we have to go to distant worlds to find other kinds of replication and other, consequent, kinds of evolution? I think that a new kind of replicator has recently emerged on this very planet. It is staring us in the face. It is still in its infancy, still drifting clumsily about in its primeval soup, but already it is achieving evolutionary change at a rate which leaves the old gene panting far behind.³

These newfangled replicators are, roughly, ideas. Not the "simple ideas" of Locke and Hume (the idea of red, or the idea of round or hot or cold), but the sort of complex ideas that form themselves into distinct memorable units. For example the ideas of:

arch
wheel
wearing clothes
vendetta
right triangle
alphabet
calendar
the Odyssey
calculus
chess
perspective drawing
evolution by natural selection
impressionism
Greensleeves

"read my lips"
deconstructionism.

Intuitively these are identifiable cultural units, but we can say something more precise about how we draw the boundaries—about why D-F#-A isn't a unit, while the theme from the slow movement of Beethoven's Seventh Symphony is. Units are the smallest elements that replicate themselves with reliability and fecundity. Dawkins coins a term for such units: memes---

a unit of cultural transmission, or a unit of imitation. 'Mimeme' comes from a suitable Greek root, but I want a monosyllable that sounds a bit like 'gene' ... it could alternatively be thought of as being related to memory' or to the French word meme ...

Examples of memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots or of building arches. Just as genes propagate themselves in the gene pool by leaping from body to body via sperm or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broad sense, can be called imitation. If a scientist hears, or reads about, a good idea, he passes it on to his colleagues and students. He mentions it in his articles and his lectures. If the idea catches on, it can be said to propagate itself, spreading from brain to brain.⁴

So far this seems to be just a crisp reworking of the standard fare about the evolution and spread of ideas, but in *The Selfish Gene*, Dawkins urges us to take the idea of meme evolution literally. Meme evolution is not just analogous to biological or genic evolution. It is not just a process that can be metaphorically described in these evolutionary idioms, but a phenomenon that obeys the laws of natural selection exactly. The theory of evolution by natural selection is neutral regarding the differences between memes and genes. They are just different kinds of replicators evolving in different media at different rates. And just as the genes for animals could not come into existence on this planet until the evolution of plants had paved the way (creating the oxygen-rich atmosphere and ready supply of convertible nutrients), so the evolution of memes could not get started until the evolution of animals had paved the way by creating a species—*homo sapiens*—with brains that could provide shelter, and habits of communication that could provide transmission media for memes.

This is a new way of thinking about ideas. It is also, I hope to show, a good way, but at the outset the perspective it provides is distinctly unsettling, even appalling. We can sum it up with a slogan:

A scholar is just a library's way of making another library.

I don't know about you, but I am not initially attracted by the idea of my brain as a sort of dung-heap in which the larvae of other people's ideas renew themselves, before sending out copies of themselves in an informational Diaspora. It seems at first to rob my mind of its importance as an author and a critic. Who is in charge, according to this vision—we or our memes?

There is, of course, no simple answer. We would like to think of ourselves as godlike creators of ideas, manipulating and controlling them as our whim dictates, and judging them from an independent, Olympian standpoint. But even if this is our ideal, we know that it is seldom if ever the reality, even with the most masterful and creative minds. As Mozart allegedly observed of his own brainchildren:

When I feel well and in a good humor, or when I am taking a drive or walking after a good meal, or in the night when I cannot sleep, thoughts crowd into my mind as easily as you would wish. Whence and how do they come? I do not know and I have nothing to do with it. Those which please me I keep in my head and hum them; at least others have told me that I do so.⁵

Mozart is in good company. Rare is the novelist who doesn't claim characters who "take on a life of their own"; artists are rather fond of confessing that their paintings take over and paint themselves, and poets humbly submit that they are the servants or even slaves to the ideas that teem in their heads. And we all can cite cases of memes that persist unbidden and unappreciated in our own minds.

The other day I was embarrassed—dismayed—to catch myself walking along humming a melody to myself: not a theme of Haydn or Brahms or Charlie Parker or even Bob Dylan. I was energetically humming: "It Takes Two to Tango," a perfectly dismal and entirely unredeemed

bit of chewing gum for the ears that was unaccountably popular sometime in the 1950s. I am sure I have never in my life chosen to listen to this melody, esteemed this melody, or in any way judged it to be better than silence, but there it was, a horrible musical virus, at least as robust in my meme pool as any melody I actually esteem. And now, to make matters worse, I have resurrected the virus in many of you, who will no doubt curse me in days to come when you find yourself humming, for the first time in thirty years, that boring tune.

The first rules of memes, as it is for genes, is that replication is not necessarily for the good of anything; replicators flourish that are good at... replicating! As Dawkins has put it,

A meme that made its bodies run over cliffs would have a fate like that of a gene for making bodies run over cliffs. It would tend to be eliminated from the meme-pool. ... But this does not mean that the ultimate criterion for success in meme selection is gene survival.... Obviously a meme that causes individuals bearing it to kill themselves has a grave disadvantage, but not necessarily a fatal one. ... a suicidal meme can spread, as when a dramatic and well-publicized martyrdom inspires others to die for a deeply loved cause, and this in turn inspires others to die, and so on.⁶

The important point is that there is no necessary connection between a meme's replicative power, its "fitness" from its point of view, and its contribution to our fitness (by whatever standard we judge that). The situation is not totally desperate. While some memes definitely manipulate us into collaborating on their replication in spite of our judging them useless or ugly or even dangerous to our health and welfare, many—most, if we are lucky—of the memes that replicate themselves do so not just with our blessings, but because of our esteem for them. I think there can be little controversy that the following memes are, all things considered, good from our perspective, and not just from their own perspective as selfish self-replicators.

Such very general memes as:

cooperation
music
writing
calendars
education
environmental awareness
arms-reduction.

And such particular memes as:

The Prisoner's Dilemma
The Marriage of Figaro
Moby Dick
long weekends
returnable bottles
the SALT Treaties
undergraduate major.

Other memes are more controversial. We can see why they spread, and why, all things considered, we should tolerate them, in spite of the problems they cause for us:

colorization of classic films
teaching assistants
grade point averages
advertising on television
Hustler magazine.

Still others are unquestionably pernicious, but extremely hard to eradicate:

anti-semitism
hijacking airliners
computer viruses
spray-can graffiti.

Genes are invisible. They are carried by gene-vehicles (organisms) in which they tend to produce characteristic effects ("phenotypic" effects) by which their fates are, in the long run, determined. Memes are also invisible, and are carried by meme-vehicles, namely pictures, books, sayings (in particular languages, oral or written, on paper or magnetically encoded, etc.). A meme's existence depends on a physical embodiment in some medium. If all such physical embodiments are destroyed, that meme is extinguished. The fate of memes depends on the selective forces that act directly on the physical vehicles that embody them. (An existent meme might make a subsequent independent reappearance—just as dinosaur genes could, in principle, get together again in some distant future to create and inhabit new dinosaurs. These dinosaurs would not be descendants of the original

dinosaurs—or at least not any more directly than we are. Such second comings of memes would also not be copies of their predecessors, but reinventions.)

Meme vehicles inhabit our world alongside the fauna and flora. They are "visible" only to the human species, however. Consider the environment of the average New York City pigeon, whose eyes and ears are assaulted every day by approximately as many words, pictures, and other signs and symbols as assault each human New Yorker. These physical meme-vehicles may impinge importantly on the pigeon's welfare, but not in virtue of the memes they carry. It is nothing to the pigeon that it is under a page of *The National Inquirer*, not *The New York Times*, that it finds a crumb.

To human beings, on the other hand, each meme-vehicle is a potential friend or foe, bearing a gift that will enhance our powers or a gift horse that will distract us, burden our memories, derange our judgment. We might compare these airborne invaders of our eyes and ears to the parasites that enter our bodies by other routes. There are the beneficial parasites such as the bacteria in our digestive systems without which we could not digest our food, the tolerable parasites, not worth the trouble of eliminating, such as all the normal denizens of our skin and scalps, and the pernicious invaders that are hard to eradicate such as fleas, lice and the AIDS virus.

So far, the meme's eye perspective may appear simply a graphic way of organizing very familiar observations about the way items in our cultures affect us, and affect each other. But Dawkins suggests that in our explanations we tend to overlook the fundamental fact that "a cultural trait may have evolved in the way it has simply because it is advantageous to itself."⁷ This is the key to answering the question of whether or not the meme meme is one we should exploit and replicate. There is an unmistakable tension between the meme's-eye view and our normal perspective on the transmission of ideas. It is time to clarify it.

The normal view is also a normative view. It embodies a canon or ideal about which ideas we ought to "accept" or admire or approve of. (It concentrates on acceptance, rather than transmission and replication; it tends to be individualistic, not communitarian. It is epistemology and aesthetics, not communication theory.) In brief, we ought to accept the true and the beautiful.

In the normal view, the fact that an idea is deemed true or beautiful is sufficient to explain why it is accepted, and the fact that it is deemed false or ugly is sufficient to explain its rejection. These norms are constitutive. We require particular explanations of deviations from these norms; their status grounds the air of paradox in such aberrations as "The Metropolitan Museum of Banalities" or "The Encyclopedia of Falsehoods." There is a nice parallel in physics. Aristotelian physics supposed that an object's continuing to move in a straight line required explanation, in terms of something like forces continuing to act on it. Central to Newton's great perspective shift was the idea that such rectilinear motion did not require explanation; only deviations from it did—accelerations. We can discern a similar difference in what requires explanation in the two views of ideas. According to the normal view, the following are virtually tautological:

Idea X was believed by the people because X was deemed true.

People approved of X because people found X to be beautiful.

What requires special explanation are the cases in which, in spite of the truth or beauty of an idea, it is not accepted, or in spite of its ugliness or falsehood it is accepted. The meme's—eye view purports to be a general alternative perspective from which these deviations can be explained. What is tautological for it is

Meme X spread among the people because X was a good replicator.

There is a non-random correlation between the two; it is no accident. We would not survive unless we had a better than chance habit of choosing the memes that help us. Our meme-immunological systems are not foolproof, but not hopeless either. We can rely, as a rule of thumb, on the coincidence of the two perspectives. By and large, the good memes are the ones that are also the good replicators.

The theory becomes interesting only when we look at the exceptions, the circumstances under which there is a pulling apart of the two per-

spectives. Only if meme theory permits us better to understand the deviations from the normal scheme will it have any warrant for being accepted. (Note that in its own terms, whether or not the meme replicates successfully is strictly independent of its epistemological virtue; it might spread in spite of its perniciousness, or go extinct in spite of its virtue.)

I need not dwell on the importance of the founding memes for language, and for writing, in creating the infosphere. These are the underlying technologies of transmission and replication analogous to the technologies of DNA and RNA in the biosphere. Nor shall I bother reviewing the familiar facts about the explosive proliferation of these media via the memes for movable type, radio and television, xerography, computers, fax machines, and electronic mail. We are all well aware that we live, today, awash in a sea of paper-borne memes, breathing in an atmosphere of electronically-borne memes.

Memes now spread around the world at the speed of light, and replicate at rates that make even fruit flies and yeast cells look glacial in comparison. They leap promiscuously from vehicle to vehicle, and from medium to medium, and are proving to be virtually unquarantinable. Memes, like genes, are potentially immortal, but, like genes, they depend on the existence of a continuous chain of physical vehicles, persisting in the face of the Second Law of Thermodynamics. Books are relatively permanent, and inscriptions on monuments are even more permanent, but unless these are under the protection of human conservators, they tend to dissolve in time. As with genes, immortality is more a matter of replication than of the longevity of individual vehicles. The preservation of the Platonic memes, via a series of copies of copies, is a particularly striking case of this. Although some papyrus fragments of Plato's texts roughly contemporaneous with him have been recently discovered, the survival of the memes owes almost nothing to such long-range persistence. Today's libraries contain thousands if not millions of physical copies (and translations) of the *Meno*, while the key ancestors in the transmission of this text turned to dust centuries ago.

Brute physical replication of vehicles is not enough to ensure meme longevity. A few thousand hard-bound copies of a book can disappear with scarcely a trace in a few years. Who knows how many brilliant letters to the editor, reproduced in hundreds of thousands of copies, disappear into landfills and incinerators every day? The day may come when non-human meme-evaluators suffice to select and arrange for the preservation of particular memes, but for the time being, memes still depend at least indirectly on one or more of their vehicles spending at least a brief, pupal stage in a remarkable sort of meme-nest: a human mind.

Minds are in limited supply, and each mind has a limited capacity for memes, and hence there is a considerable competition among memes for entry into as many minds as possible. This competition is the major selective force in the infosphere, and, just as in the biosphere, the challenge has been met with great ingenuity. For instance, whatever virtues (from our perspective) the following memes have, they have in common the property of having phenotypic expressions that tend to make their own replication more likely by disabling or pre-empting the environmental forces that would tend to extinguish them: the meme for faith, which discourages the exercise of the sort of critical judgment that might decide that the idea of faith was all things considered a dangerous idea⁸; the meme for tolerance or free speech; the meme of including in a chain letter a warning about the terrible fates of those who have broken the chain in the past; the conspiracy theory meme, which has a built-in response to the objection that there is no good evidence of the conspiracy: "Of course not-that's how powerful the conspiracy is!" Some of these memes are "good" perhaps and others "bad." What they have in common is a phenotypic effect that systematically tends to disable the selective forces arrayed against them. Other things being equal, population memetics predicts that conspiracy theory memes will persist quite independently of their truth, and the meme for faith is apt to secure its own survival, and that of the religious memes that ride piggy-back on it, in even the most rationalistic environments. Indeed, the meme for faith exhibits frequency-dependent fitness: it flourishes particularly in the company of rationalistic memes.

Other concepts from population genetics also transfer smoothly. Here is a case of what a geneticist would call linked loci: two memes that happen to be physically tied together so that they tend to replicate together. a fact that affects their

chances of replicating. There is a magnificent ceremonial march, familiar to us all, and one that would be much used for commencements, weddings, and other festive occasions, perhaps driving "Pomp and Circumstance" and the Wedding March from "Lohengrin" to near extinction, were it not for the fact that its musical meme is so tightly linked to its title meme, which we all tend to think of as soon as we hear the music: Sir Arthur Sullivan's unusable masterpiece, "Behold the Lord High Executioner."

This is a vivid case of one of the most important phenomena in the infosphere: the mis-filtering of memes due to such linkages. We all have filters of the following sort:

ignore everything that appears in X.

For some people, X is *The National Inquirer* or *Pravda*; for others it is *The New York Review of Books*. We all take our chances, counting on the "good" ideas to make it eventually through the stacks of filters of others into the limelight of our attention.

This structure of filters is itself a meme construction of considerable robustness. John McCarthy, the founder of Artificial Intelligence (or in any event, the coiner of its name, a meme with its own, independent base in the infosphere) once suggested to a humanist audience that electronic mail networks could revolutionize the ecology of the poet. Only a handful of poets can make their living by selling their poems, McCarthy noted, because poetry books are slender, expensive volumes purchased by very few individuals and libraries. But imagine what would happen if poets could put their poems on an international network, where anybody could read them or copy them for a penny, electronically transferred to the poet's royalty account. This could provide a steady source of income for many poets, he surmised. Quite independently of any aesthetic objections poets and poetry lovers might have to poems embodied in electronic media (more to the point: poems displayed in patterns of excited phosphor dots on computer screens), the obvious counter-hypothesis arises from population memetics. If such a network were established, no poetry lover would be willing to wade through thousands of electronic files filled with doggerel, looking for the good poems. There would be a niche created for various memes for poetry-filters. One could subscribe, for a few pennies, to an editorial service that scanned the infosphere for good poems. Different services, with different critical standards, would flourish, as would services for reviewing all the different services and still more services that screened, collected, formatted, and presented the works of the best poets in slender electronic volumes which only a few would purchase. The memes for editing and criticism will find niches in any environment in the infosphere. They flourish because of the short supply and limited capacity of minds, whatever the transmission media between minds.

The structure of filters is complex and quick to respond to new challenges, but it doesn't always "work." The competition among memes to break through the filters leads to an "arms race" of ploy and counterploy, with ever more elaborate "advertising" raised against evermore layers of selective filters.

Whether this is a good or bad thing depends on your point of view. The huge arrays of garish signs that compete for our attention along commercial strips in every region of the country are the exact counterpart, in the infosphere, of the magnificent redwood forests of the biosphere. If only those redwoods could get together and agree on some sensible zoning restrictions and stop competing with each other for sunlight, they could avoid the trouble of building those ridiculous and expensive trunks, stay low and thrifty shrubs, and get just as much sunlight as before!⁹ In the more dignified ecology of academia, the same arms race is manifested in department letterheads, "blind refereeing," the proliferation of specialized journals, book reviews, reviews of book reviews, and anthologies of "classic works."

These filters are not even always intended to preserve the best. Philosophers might care to ask themselves, for instance, how often they are accomplices in increasing the audience for a second-rate article simply because their introductory course needs a simple-minded version of a bad idea that even the freshmen can refute. Some of the most often reprinted articles in twentieth century philosophy are famous precisely because nobody believes them; everybody can see what is wrong with them.¹⁰

A related phenomenon in the competition of memes for our attention is positive feedback. In

biology, this is manifested in such phenomena as the "runaway sexual selection" that explains the long and cumbersome tail of the bird of paradise or the peacock. Dawkins provides an example from the world of publishing: "Best-seller lists of books are published weekly, and it is undoubtedly true that as soon as a book sells enough copies to appear in one of these lists, its sales increase even more, simply by virtue of that fact. Publishers speak of a book "taking off," and those publishers with some knowledge of science even speak of a "critical mass for take-off."¹¹

The haven all memes depend on reaching is the human mind, which is itself an artifact created when memes restructure a human brain in order to make it a better habitat for memes. The avenues for entry and departure are modified to suit local conditions, and strengthened by various artificial devices that enhance fidelity and prolixity of replication. Native Chinese minds differ dramatically from native French minds, and literate minds differ from illiterate minds. What memes provide in return to the organisms in which they reside is an incalculable store of advantages-with some Trojan horses thrown in for good measure, no doubt. Normal human brains are not all alike; they vary considerably in size, shape, and in the myriad details of connection on which their prowess depends. But the most striking differences in human prowess depend on micro-structural differences (still inscrutable to neuroscience) induced by the various memes that have entered them and taken up residence. The memes enhance each other's opportunities: the meme for education, for instance, is a meme that reinforces the very process of meme-implantation.

If it is true that human minds are themselves to a great degree the creations of memes, we cannot sustain the polarity of vision with which we started. It cannot be "memes versus us," because earlier infestations of memes have already played a major role in determining who or what we are. (Some folks say you are what you eat, but it is closer to the truth to say you are what you read.) The "independent" mind struggling to protect itself from alien and dangerous memes is a myth. There is (in the basement, one might say) a persisting tension between the biological imperative of the genes and the imperatives of the memes, but we would be foolish to "side with" our genes-that is to commit the most egregious error of pop sociobiology. What foundation, then, can we stand on as we struggle to keep our feet in the memestorm in which we are engulfed? If replicative might does not make right, what is to be the eternal ideal relative to which "we" will judge the value of memes? We should note that the memes for normative concepts-for ought and good and truth and beauty are among the most entrenched denizens of our minds, and that among the memes that constitute us, they play a central role. Our existence as us, as what we as thinkers are-not as what we as organisms are-is not independent of these memes.

Dawkins ends *The Selfish Gene* with a passage that many of his critics must not have read:

We have the power to defy the selfish genes of our birth and, if necessary, the selfish memes of our indoctrination. ... We are built as gene machines and cultured as meme machines, but we have the power to turn against our creators. We, alone on earth, can rebel against the tyranny of the selfish replicators. (p. 215)

In thus distancing himself thus forcefully from the oversimplifications of pop sociobiology, he somewhat overstates his case. This "we" that transcends not only its genetic creators but also its memetic creators is a myth. Dawkins seems to acknowledge this in his later work. In *The Extended Phenotype*, Dawkins argues for the biological perspective that recognizes the beaver's dam, the spider's web, the bird's nest as not merely products of the phenotype-the individual organism considered as a functional whole- but rather as parts of the phenotype, on a par with the beaver's teeth, the spider's legs, the bird's wing. From this perspective, the vast protective networks of memes we spin is as integral to our phenotypes-to explaining our competencies, our chances, our vicissitudes-as anything in our more narrowly biological endowment.¹² There is no radical discontinuity; one can be a mammal, a father, a citizen, scholar, Democrat, and an associate professor with tenure. Just as man-made barns are an integral part of the barn swallow's ecology, so cathedrals and universities-and factories and prisons-are an integral part of our ecology. They are the memes without which we could not live in these environments.

Homo sapiens has been around for half a

million years. The first serious invasion of memes began with spoken language only tens of thousands of years ago. The second great wave, riding on the meme for writing, is considerably less than ten thousand years in progress—a brief moment in biological time. Since memetic evolution occurs on a time scale thousands of times faster than genetic evolution, however, in the period since there have been memes—only tens of thousands of years—the contributing effects of meme-structures on our constitution—on human phenotypes—vastly outweigh the effects of genetic evolution during that period. So we can answer the defining question of the Mandel Lecture with a rousing affirmative. Does art (in the broad sense) contribute to human evolution? It certainly does. In fact, since art appeared on the scene, it has virtually supplanted all other contributions to human evolution.¹³

I would like to close with some observations on the history of the meme meme itself, and how its spread was temporarily curtailed. When Dawkins introduced memes in 1976, he described his innovation as a literal extension of the classical Darwinian theory and so I have treated it here. Dawkins, however, has since drawn in his horns slightly. In *The Blind Watchmaker* (1988), he speaks of an analogy "which I find inspiring but which can be taken too far if we are not careful" (p. 196). He goes on to say "Cultural 'evolution' is not really evolution at all if we are being fussy and purist about our use of words, but there may be enough in common between them to justify some comparison of principles" (p. 216). Why did he retreat like this? Why, indeed, is the meme meme so little discussed thirteen years after *The Selfish Gene* appeared?

In *The Extended Phenotype*, Dawkins replies forcefully to the storm of criticism from sociobiologists, while conceding some interesting but inessential disanalogies between genes and memes—memes are not strung out along linear chromosomes, and it is not clear that they occupy and compete for discrete 'loci', or that they have identifiable 'alleles'... The copying process is probably much less precise than in the case of genes ... memes may partially blend with each other in a way that genes do not. (p. 112)

But then he retreats further, apparently in the face of unnamed and unquoted adversaries:

My own feeling is that its [the meme meme's] main value may lie not so much in helping us to understand human culture as in sharpening our perception of genetic natural selection. This is the only reason I am presumptuous enough to discuss it, for I do not know enough about the existing literature on human culture to make an authoritative contribution to it. (p. 112)

I think that what happened to the meme meme is quite obvious: "humanist" minds have set up a particularly aggressive set of filters against memes coming from "sociobiology." Once Dawkins was identified as a sociobiologist, this almost guaranteed rejection of whatever this interloper had to say about culture—not for good reasons, but just in a sort of immunological rejection.¹⁴

But look how the meme meme has now infiltrated itself into another, less alien vehicle, a clearly identified, card-carrying academic humanist, a philosopher. In this guise—clothed in a philosopher's sort of words—will it find better chances of replication? I hope so.

My chosen role in this Mandel Lecture has been a humble one, a mere vector, a transmitter, with just a few embellishments and mutations, of a meme that has come to play a large role in my mind—large enough, for instance, to determine the content of this lecture. My purpose, after all, has been to create in your minds robust, aggressive copies of various memes that inhabit my mind. I hope that I have succeeded in that modest goal, and moreover, that you will forgive me for reviving "It Takes Two to Tango" and be grateful to me for passing on the meme meme.

DANIEL C. DENNETT

*Center for Cognitive Studies
Tufts University
Medford, MA 02155*

1. See, for instance, Richard Lewontin, "Adaptation," *The Encyclopedia Einaudi* (Milan: Einaudi, 1980); Robert Brandon, "Adaptation and Evolutionary Theory," *Studies in the History and Philosophy of Science* 9 (1978): 181-206; both reprinted in E. Sober, ed., *Conceptual Issues in Evolutionary Biology* (MIT Press, 1984).

2. Richard Dawkins, *The Selfish Gene* (Oxford University Press, 1976), p. 206.

3. *Ibid.*

4. *Ibid.*

5. Peter Kivy informed me after the Mandel Lecture that this oft-quoted passage is counterfeit—not Mozart at all. I

found it in Jacques Hadamard's classic study. *The Psychology of Inventing in the Mathematical Field* (Princeton University Press, 1949), p. 16 [emphasis added], and first quoted it myself in "Why the Law of Effect Will Not Go Away." *Journal of the Theory of Social Behaviour* 5 (1975): 169-87, reprinted in my book. *Brainstorms* (MIT Press/A Bradford Book, 1978). I persist in quoting it here, in spite of Kivy's correction, because it not only expresses but exemplifies the thesis that memes, once they exist, are independent of authors and critics alike. Historical accuracy is important (which is why I have written this footnote), but the passage so well suits my purposes that I am choosing to ignore its pedigree. I might not have persisted in this, had I not encountered a supporting meme the day after Kivy informed me: I overheard a guide at the Metropolitan Museum of Art, commenting on the Gilbert Stuart portrait of George Washington: "This may not be what George Washington looked like then, but this is what he looks like now."

6. Richard Dawkins, *The Extended Phenotype* (Oxford: W.H. Freeman, 1982), pp. 110-111.

7. Dawkins, *The Selfish Gene*, p. 214.

8. *Ibid.*, p. 212.

9. This, the "tragedy of the commons," deserves a more careful treatment than I can offer on this occasion. Note too that I am submerging a complication that properly should bring our discussion full circle, back to the ideas of Adam Smith about economic competition that first inspired Darwin. The competition of the billboards is competition for our attention, but the ulterior goal of acquiring our attention is the seller's goal of acquiring our money, not the meme's goal of replicating itself. The academic examples are not independent of economics, of course, but economics plays a less dominant role, as was ironically acknowledged on a T-shirt worn by a member of the audience at the Mandel Lecture: "Philosophy: I'm in it for the money."

10. The confirmation of this claim is left as an exercise for the reader. Among the memes that structure the infosphere and hence affect the transmission of other memes are the laws of libel.

11. Richard Dawkins, *The Blind Watchmaker* (London: Longman Scientific, 1986), p. 219. Dawkins' discussion of these complex phenomena, in the chapter "Explosions and Spirals" (pp. 195-220), is a tour de force of explanatory clarity and vividness.

12. In several recent essays I have expanded on the claim that the very structure of our minds is more a product of culture than of the neuroanatomy we are born with: "Julian Jaynes' Software Archeology," in *Canadian Psychology* 27 (1986): 149-154; "The Self as the Center of Narrative Gravity," originally published as "Why we are all novelists," *Times Literary Supplement* (Sept. 16-22. 1988), p. 1029, forthcoming in F. Kessel, P. Cole, D. Johnson, eds., *Self and Consciousness. Multiple Perspectives*, (Hillsdale, NJ: Erlbaum); "The Evolution of Consciousness," forthcoming in *The Reality Club*, volume 3; and "The Origins of Selves," forthcoming in *Cogito*. See also Nicholas Humphrey and Daniel Dennett, "Speaking For Our Selves: An Assessment of Multiple Personality Disorder," *Raritan* 9 (1989): 68-98.

13. Those who are familiar with the Baldwin Effect will recognize that art contributes not merely to the fixing of phenotypic plasticity, but can thereby change the selective environment and hence hasten the pace of genetic evolution. See my discussion in "The Evolution of Consciousness," and Jonathan Schull, "Are Species Intelligent?" forthcoming in *Behavioral and Brain Sciences*.

14. A striking example of the vituperative and uncomprehending dismissal of Dawkins by a humanist who identifies him as a sociobiologist is found in Mary Midgley. "Gene Juggling," *Philosophy* 54 (1979): 439-458, an attack so wide of the mark that it should not be read without its antidote: Dawkins's response. "In Defense of Selfish Genes," *Philosophy* 56 (1981): 556-573.