

# COGNITIVE THEISM: SOURCES OF ACCOMMODATION BETWEEN SECULARISM AND RELIGION

*by Robert B. Glassman*

*Abstract.* Religion persists, even within enlightened secular society, because it has adaptive functions. In particular, Ralph Wendell Burhoe's theory holds that religion is the repository of cultural wisdom that most encourages mutual altruism among nonkin, long-term social survival, and human progress. This article suggests a variant of Burhoe's rationalized naturalistic view. *Cognitive theism* is a proposal that secularists sometimes take religion on its own terms by suspending disbelief about God. If we consider particular human capacities and limitations in memory, perception, personality, and motivation, the regulated "mind expansion" of cognitive theism may help us to evaluate, coordinate, and invigorate things in a modern environment. In this environment, communicative and travel technologies have led to a high loading of consciousness with a historically unusual diverse range of experiences and responsibilities, a high rate of cultural change relative to biological evolution, and a tendency to factionalize. Burhoe's extension of the concept of symbiosis to the coevolution of culture and genes is modified here in recognition of individual differences and of individuals' potential for choosing strategies, recombining in groups, and learning. In human *biocultural symbiont pools*, cultural phenomena can evolve while changing partners in a dance with genetic substrates, a dance that broadly supports these substrates. In the context of diversity and incessant change in a large predominantly secular community, Judeo-Christian monotheism can have a valuable advisory unifying function.

*Keywords:* belief; biocultural evolution; Ralph Wendell Burhoe; civilization; doubt; gene-culture coevolution; intellectuals; memory; motivation; perception; personality; progress; purpose; psychology; secularism; stories; survival; symbiosis; theism.

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Robert B. Glassman is a neuroscientist who is Professor of Psychology and chair of that department at Lake Forest College, Lake Forest, IL 60045.

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MODERN COMPLEXITY AND THE NEED FOR BOTH COGNIZANCE  
AND RELIGION

Secular civilization is exciting. At its best, there are individual freedoms of thought and action, constructive, humane ferment, and varieties of human achievement in arts, sciences, and technology. Yet there is a great paradox in the apparently irrational *persistence of religion* in secular societies. For intellectuals—steeped in rationalism—a sense of the fantastic about religion is sometimes mitigated, sometimes accentuated, by its sheer ambiance. How is it that the intelligence of most normal people is consistent with such unworldly ideas?

The persistence of religion may arise out of a generalized perception of a shortcoming of life without it. Perhaps at some level people sense that secularism tends to undercut itself in the long run. Early on, it divides the wind in society's sails into diverse, liberating, navigable breezes, but these often fracture into chaotic eddies of special interests in which social progress eventually stalls (Bartley 1995; Hughes 1993; Schlesinger 1992; Steele 1992). Such problems of the current age may have started long ago. Within a century of the posthumous publication, in 1543, of Copernicus's *Revolutions of the Heavenly Bodies*, John Donne (1624) implored poetically for a recovery of waning heavenly unity: "No man is an island entire of itself." According to Ralph Wendell Burhoe (1981, 1987), if the rationalistic mentality does not draw energy and structural stability from some sort of sacralizing process, civilization may falter; yet religions, marginalized from society's main business, all too often merely congeal isolating doctrines and rituals.

Pursuing ideas of Burhoe (e.g., 1973, 1981, 1987; also see Breed 1992 and Gilbert et al. 1995), I argue here that the voices of religion are not merely leaden and reactionary but that often, for all their potential misleading, they represent genuine sources of wisdom in a "well-winnowed" (Campbell 1988), compacted code that is an integral part of biocultural organization and evolution. We hear their muffled nagging because they have not yet been adequately summoned in this epoch.

The term *cognitive theism* names a proposal for secular intellectuals, to commit themselves to taking occasional sojourns in *suspended disbelief* in order to think *in* theistic metaphors rather than *about* them. We do this in the hope of arriving at new ideas about constructively organizing our lives in an advanced civilization. These time-limited exercises may help us safely to go beyond our modest capacity as individuals for conscious thought.

This serious thought game has a counterpart in writings by liberal theologians. For example, Paul Tillich (1957, 1976) uses the phrase "the Protestant Principle" in a way that recalls the meaning of the verb *protest* and introduces the term "Spiritual Presence" in characterizing our need

to continue to resist “profanizing” routinization of rituals and doctrines, or self-indulgent forms of piety, to reach the deeper meanings of religion. Analogously, Jewish theologian Martin Buber (1967) urges an open attitude toward the ultimate, in contrast to the all-too-frequent stultifying adherence to doctrinal word surfaces. Philip Hefner’s (1991) discussion of the “love principle” renders Judeo-Christian religious doctrine in matter-of-fact terms that clarify its role in the lives of real people.

Cognitive theism urges a prolonged transitional mentality, to allow an enlarged search for strategies of tolerance between religion and secularism. The term borrows from the contemporary prominence of cognitive sciences and is a play upon the name of the dominant contemporary paradigm of psychotherapy in America, known as *cognitive therapy* (Beck 1967; Seligman et al. 1990; Startup and Shapiro 1993). Cognitive therapy is an approach that draws from humanistic and behavioral traditions (Hall and Lindzey 1978), to establish a democratic atmosphere for problem solving in which the therapist acts as a consultant, in contrast to the distanced quasi-clerical image of authority characteristic of the older psychoanalytic style and of the medical model in psychiatry (e.g., Coleman, Butcher, and Carson 1980; Kramer 1993).

A basic idea in cognitive therapy is that by learning measured new perspectives for interpreting the personal significance of events, one can better manage one’s moods. Analogously, for those of us who are deep in the dominant secular mentality, cognitive theism is a significant small step toward recovering important values that can be achieved only within a religious mentality.

This step may not be as large as it seems. In taking it here we will make use of scientific concepts from psychology, arguably religion’s leading secular competitor as humans strive for better understanding of their souls. Psychology has more in common with religion, in ways both positive and negative, than its practitioners ordinarily care to admit. As in other sciences, leaders’ definitions of research areas often acquire a doctrinal quality, and empirical research may sometimes turn into repetitious gnostic laboratory rituals of legions of graduate students and other followers. However, what is indeed different from old-fashioned religion is the openly declared zest for *new* truths in science. We professors constantly seek that ideal way of encouraging students to exercise their freedom and be creative while learning what is already known.

#### SOURCES OF RISK

*A Risk in Cognitive Theism.* Explicitly suspending disbelief for a time “to turn the God concept into God” may be somewhat like instructing children to adopt the Santa Claus idea as a fictional device for

structuring their childhood—telling them that “Santa is a heuristic.” This may misplace an abstraction, in hapless analogy with the strained curriculum of the “new math” in grade schools about two decades ago (Kline 1973). The concept of God has an adaptive function that may evaporate in the face of the hubris that leads us to make eye contact with God, as it were, and try to take better control. Perhaps this is why searches for reconciliation with religion are as old as secularism (Bronowski and Mazlish 1960; Spadafora 1990). Yet a “noble lie” (Condie 1992) still feels like a lie. Secularists’ faces may refuse to remain straight when they speak of religious ontologies, and religionists’ eyes may roll as they perceive inadequacy in a secularist’s conditional attempt at sincerity.

*Social Risk in Religion.* Despite its values, religion carries risks. It can encourage violence. Doctrines and rituals can be hostile, impermeable boundaries. For example, consider the history of the European peninsula. Although tiny on a global scale it comprises a patchwork of ethnic groups whose cultural mix has proven immensely fertile (Kennedy 1987). However, tolerant times have alternated with violent episodes, often superheated by religion. Recent horrors in the former Yugoslavia (Hundley 1995) are but one example in the long, frightening history of genocides (Diamond 1992, chap. 16), but they are an example that raises particularly well the twin questions of how potentially angry, diverse populations can have productively intermingled for so long, and what caused that integration finally to fail. Exactly what role has religion played?

*Intellectual Risk in Religion.* Religion can make you foolish. Traditional belief in God can soften thinking with pockets in which intellectual challenges are avoided. For example, literal-minded creationism undercuts evolutionary theory by anesthetizing live regions of inquiry into the real world. Yet theological liberals of the past sometimes granted too much to incomplete science; fearful of appearing preposterous, they made their last stands on the ground of the seemingly few things that had not yet been touched by science—leading critics to speak of a “god of the gaps.” Such a wholesale retreat before science suggests that biblical literalism had played too large a role even for those theologians. They too readily abandoned the deeper metaphorical religious meanings, over which they had custody, to an Occam’s razor of physical sciences and early biological and social sciences that was cutting with too much abandon.

*The Risks in Spurious Mysticisms Spun Off from Science.* Pretensions of scientists can be as intellectually risky as primitive magical ideas from religion. Physical scientists should educate themselves in biobehavioral

sciences before exploiting their prestige with pontifications about God or human nature (I would include Snow 1965). Such is the case with amateur philosophizers who have drawn lines from elementary particles directly to God or to human minds, sometimes involving, and purporting to explain, paranormal phenomena. Most psychologists have been correctly cautious in routinely doubting such alleged phenomena. As with literal creationism, magical speculations about the paranormal can conceal stubborn withdrawal from science's challenges to intellect (Bunge 1992).

#### COMPLEXITY, NATURAL LAWS, AND STORIES

Humanistic inquiry is not mysticism and should be viewed collegially by scientists. Although science is *distinguished* by such things as lab experiments and math, these do not necessarily comprise *most* of what scientists do. Scientific inquiry is also thoughtful, observant, logical, pattern recognizing, qualitative, inspired, and based in the recent history of each particular field—in much the same way as humanistic inquiry is.

Science is about wholes and parts (Faber 1986). Sometimes parts are viewed directly, as, for example, in looking at nerve cells under a microscope, while at other times inferences about underlying entities and sub-processes are highly indirect, as when observing atomic particles in physics, or human decision-making processes in cognitive psychology (Anderson 1990). Science also often involves a modeled or actual synthesis of hypothesized parts into a whole (Teitelbaum and Pellis 1992). With complex phenomena we may seem no longer to be talking about fundamental physical laws but about wonderful combinatorial effects in fortuitous confluences of a meandering, branching river of history (Pagels 1988; Peacocke 1991). Even from syntheses as simple as the mathematical models of chaos theory there can emerge organized complexity whose particular novel forms cannot be predicted but are certainly deterministic (Peitgen, Jurgens, and Saupe 1992; Polkinghorne 1991).

The same situation is present in all of social science, biology, and at levels of scientific analysis at least as far down as the chemistry of polymers. Organizations of dynamically interacting diverse entities can be extremely complex and novel. A hypothetical incorporeal intelligent being who had never seen the world but only a disconnected sample of atoms might guess that only a disorganized cacophony could arise. Yet marvelous regularities emerge at many levels.

At the level of social phenomena, regularities often seem wispy, because our own lives are part of the emerging grain. That prediction may be possible only in the actual becoming of things is a fact that Kenneth Boulding dubs the "principle of fundamental surprise" (see

Glassman 1975). A related lesson of historiography is that ordinary events frequently cumulate to surprises (Carr 1961; Durant and Durant 1968; Gottschalk 1954).

At the social level a peculiar thing happens. As we feel our way through history—passionately deciding (Ashbrook 1989), reaching, retracting, reaching, and advancing—the distinction between discovery and invention blurs. An *ought*, when obeyed, results in an *is*, which then feeds back. However, natural selection has the final say (Burhoe 1981, 1986) about whether an *ought* and its *is* will endure. Other heartfelt commitments will be damned, pious or not.

Humans are storytellers, and stories implicitly assert theories of human complexity, with one leg in the past and the other in a possible future (see Peters 1992). Physical chemist and social scientist Michael Polanyi commented, "Shakespeare's sonnets [cannot] be traced back to a pattern inscribed in the primordial incandescent gases. . . . My answer to this view is to accredit once more my capacity for comprehending entities which are not specifiable in terms of their particulars—of particulars which are themselves usually comprehensive features and hence in their turn are unspecifiable in terms of their particulars, and so on (Polanyi [1958] 1964, 361).

#### THE PSYCHOLOGY OF MEMORY: COPING WITH LIMITS OF CONSCIOUSNESS

How is it possible for human minds to cope with the world's complexity in ways other than storytelling? We are capable only of epistemological grasps at reality restricted at any one time to a small number of nameable subsystems; this cognitive restriction is more extreme than a more general requirement for boundaries and inclusion hierarchies underlying any sort of orderly biological change in ontogeny or evolution (Glassman and Wimsatt 1984; Simon 1969). But one of the most prominent characteristics of contemporary society is the helplessness of single individuals in the face of the demands of the information explosion (Rue 1989).

Two fundamental cognitive limitations of single individuals are the overall amount we can learn in a lifetime (Glassman 1977, 1988) and our ability to think of only a limited number of things at once. These limitations add plausibility to the suggestion that it would be worthwhile sometimes to lend ourselves to well-winnowed (Campbell 1988) theistic traditions to safely expand the mind.

*Short-Term Memory, or Working Memory.* In a classic theoretical review paper, George A. Miller (1956) argued that people can keep about *seven*, plus or minus two, items in immediate memory at one time. This

is now usually called *short-term memory*, or *working memory*. A great deal of subsequent research has substantially confirmed Miller's figure, while adding knowledge about the relevance of sense modality, focal brain damage, the complexity of the items, and other factors (Baddeley 1990; Shiffrin and Nosofsky 1994).

The roughly seven things that we can hold in mind at once may be digits, letters, or words. Because individual words may represent rather complex *ideas*, the matter of information capacity in short-term memory becomes curiously pliable. A resolution of this puzzle is in the notion that each of the approximately seven chunks (Miller 1956) being held for the moment in short-term memory is really a label for, and link to, a subset of *long-term memory*. Recent empirical findings in my laboratory using a human-sized version of a radial-arm maze, and correcting for guesses via a probability model, strongly suggest that the magical number  $7 \pm 2$  applies not only to verbal processes but also to working memory for positions in space, and that this is so in both humans and other mammalian species (O'Connor and Glassman 1993; Glassman et al. 1994). (Parenthetically, we might ask whether some of the appearances in the Bible of the number seven mirror these human limits of grasping several things at once: e.g., things that are an abomination to the Lord (Prov. 6: 16-19), days of the week from Sabbath to Sabbath, members of each privileged species on Noah's ark, seven churches in Asia, and the book sealed with seven seals.)

*Implicit Memory.* The contemporary experimental psychology concept of implicit memory is a dispassionate version of the psychodynamically styled *unconscious*, from which things reach up and move us. In one typical demonstration a person is shown a fragment of an infrequently used word; if that person has within the past hour or so read a passage containing the target word, the fill-ins for the blanks leap to mind more quickly, yielding perception of the whole word, although there may be no conscious recall of having recently read the target word (Schachter 1987).

*Memory Errors.* We have a fair recognition memory for as many as ten thousand pictures recently viewed (Anderson 1990, 116-17), yet we also unwittingly and readily collapse two memories together, mistake their origins, or even reconstruct fragments into remembered events that never happened, sometimes to the detriment of eyewitness testimony (Loftus 1995). Our considerable vulnerability to persuasion (Cialdini 1993) may sometimes be interpreted as vulnerability to erroneous recombinations of memories.

*Context-Dependent Memory.* The dissociative phenomena observed in

state-dependent memory and context-dependent memory provide a final set of relevant examples. Memories are retrieved more readily when they occur in an environmental context similar to that in which they were acquired or when internal conditions, as influenced by mood or certain drugs, are the same as during acquisition (Spear and Riccio 1994). One practical relevancy is that we may know something relevant to some problem at hand, but it may be in an area of our interests that is ordinarily disconnected from the problem. Perhaps this is a reason why it is often good to take a break from a difficult problem, allowing it to incubate (Anderson 1990, 251-53).

*Mind Expansion within the Safety of Religion.* These comments about cognitive limitations may be cause for worry or frustration, but they also suggest opportunity. Again consider our opening question: In our pervasively secular culture, why does religion persist? Perhaps because it can expand the mind, and in secularly relevant ways, rather than always narrowing it, as secularists routinely fear. There must sometimes be worldly advantage to giving free reign within wise bounds to unconscious sources of information, as kindled by the theistic symbols of our culture. During the sixties, gurus of hallucinogens took a stab at wisdom in advising their disciples to “trip” only in a supportive social context. Without giving these daredevils too much credit, we might adapt their advice to say that cognitively theistic suspensions of disbelief should involve solid contact with sound religious and academic communities.

*Diversity Mind Expansion.* Traditions rub elbows in our variegated secular society, but we might also try to carry things further—rubbing minds in hope of discovering larger coherences. In some cognitive theism exercises we should visit our neighbors’ religious traditions. While being respectful, we should not ignore real sources of conflict that may emerge from religious differences. Some religious dissimilarities represent deep real-world cultural differences in adaptive strategies, while others comprise diverse clothing for similar strategies. Even in the latter case, because subgroup size is an important factor in human adaptation (because we are able to remember only so many acquaintances and have time to sustain regular interactions with only so many friends) we cannot naively assume that mere recognition that a cultural difference is superficial will automatically lead to healthy and trusting integration.

*Diversity versus Syncretism.* How far should we go in experimentally lending ourselves to different religions? While both the Hebrew Bible and New Testament encourage respect for strangers, the Old Testament often plays hardball in its severe warnings against broad-reaching mix-

ing, as in the story of Babel (Gen. 11), in Saul's punishment for not fully following Samuel's orders against the Amalekites (1 Sam. 15), and in the ubiquitous severity of the prophets' recriminations against celebrating the gods of neighbors. The New Testament also warns in the most threatening way against the addition of new ideas to the religion (Rev. 22 : 18). It would be hasty to brush aside all such biblical warnings as merely representing old-fashioned narrow-mindedness. Mixing can lead either to new salutary growth or to intrinsic inconsistencies, fragmentation, and increased entropy. To compound this issue, during the past quarter century additional diversity has accumulated, with an upwelling of popular interest in the quasi-religious themes of various self-help movements, and in stories, films, and games styled in the manner of myths. Some of this material is good and some is pandering. The public is encouraged to tap religiously tinged emotions during play and to think appreciatively about approximations to polytheism or even idol worship, in fictional quasi-mythic quests for such paraphernalia as magic rings, swords, or light sabers, and so forth. In the Judeo-Christian tradition, this process has often after great struggle ripened into reflection on the deeper meanings symbolized by concrete forms rather than veneration of relics. All of this means that the present undertaking of openness in cognitive theism is risky, but it is a worthwhile American adventure.

### THREE NONABSURDITIES FROM TWO PROPHETS AND A SECULAR DESCENDENT: MOSES, JESUS, AND THOMAS JEFFERSON

The average American retains a general notion of ambient religious ethics, at least in the basic teachings of Jesus and the Ten Commandments. But against our dominant secular backdrop, the ethics in religion are associated with three apparent absurdities:

1. The operational social imperatives are squeezed into the so-called *second table* of the Ten Commandments. The *first table* concerns the elements of a proper belief in God; as abbreviated reminders: (a) "I am the one God." (b) "Do not make an idol." (c) "Do not abuse God's name." (d) "Keep the Sabbath holy" (Exod. 20).

An impatient secularist may well ask what the value is of exhausting nearly half of the space allocated for life's central rules in such nonoperational background postulates. A possible answer is in the prerequisite importance of focusing attention, thereby organizing ethical knowledge and enclosing it within cognitive structures that both aid memory and conduce to relevant action. In the vernacular of today, Moses might well have introduced the commandments by saying, "Remember that each of you is made in God's image. What you do may make a big

difference. So listen!" This hypothesis suggests relevance of the frontal lobe's roles in working memory and intentionality, but an additional possible way to think about it is as a reflection of the partial division of function between our hemispheres: The opening commandments are more concerned with global and emotional matters (right hemisphere), the later ones with local and sequential specifics (left hemisphere; Springer and Deutsch 1993).<sup>1</sup> In an age of soap operas, we may be rediscovering meaning in the peculiar transgenerational warning of the second commandment; as our children mature, some of their motivations may be shallow because of the lifestyles they have seen portrayed in television imagery.

2. Analogous to the character of the opening commandments is Jesus' summary of the commandments' essence. He discards outright the explicit social function instructions, in declaring that the two commandments most important to remember are to "love the Lord your God" and to "love your neighbor" (Mark 12 : 28-34).<sup>2</sup> Jesus is portrayed in the New Testament as having realized that a set of rules for right behavior unfortunately may pave the way for hypocritical expediencies. Laws beget systems of evasion, which may beget further laws, which beget more labyrinthine evasions, and so on. But laws also have a spirit. Helped to perceive this spirit, a community may finesse the niggling of endless rules, and this is what Jesus drives at. The love command is rich with functional significances (Hefner 1991).

3. The third apparent absurdity to our impatient secularist with dim memory of religion and history is in the surprising fact that Thomas Jefferson, a founding father of the foremost haven of secularism in Western civilization, remembered the Bible well enough to dash off within a few days a set of selections from the Gospels which tell of "The Life and Morals of Jesus of Nazareth," without what Jefferson perceived to be the Bible's additional encumbering ritualism and supernaturalism (Jefferson [1820] 1989). During the late years of the twentieth century it is easy to forget that in cherishing nature in the New World they had adopted, Jefferson (Miller 1988) and the other deists remained rooted in the Judeo-Christian tradition. This tradition penetrated their work, although perhaps less so than the presupposition of God's existence that had pervaded the thinking of Locke and other Enlightenment philosophers of an earlier generation (Spadafora 1990).

*A Goodly Need for Godliness.* Of course, these three observations are not absurdities after all but are offered here in an informal version of proof by assumption and contradiction. Moses, Jesus, Thomas Jefferson, and their associates were tremendously successful in renewing moral societies. This suggests that an ethically sound secular society requires that its secularism's individualistic, rationalistic instrumentali-

ties be mitigated by the momentum of a recent theistic era. A secular society may be able to persist only so long as it somehow succeeds in drawing from the capital of values and wisdom that presecular generations have deposited. *Deism* as a codified way of thinking that partially reconciled secularity with theism waned rather quickly, not outliving the American founding fathers. Perhaps deism not only engages energetic religious emotion insufficiently but also somehow lacks valuable information that clings to the "superstitions" of theism.

The vacuum left by waning theism may explain the puzzling repeated surges of fundamentalism in American and British history (Turner 1985; Spadafora 1990). Perhaps what has happened is that contemporaneous geographically intermixed American subpopulations of religionists and humanists somehow have managed to fertilize each other culturally, often without pleasure, like partners in a squabbling marriage. We may eventually have to admit that some sets of ideas must incubate and flourish primarily within mutually standoffish human subpopulations, each unhampered by qualifying frictions from the other; however, it nevertheless seems possible for those who are different to like each other. Somewhat analogously, as a scientist I have enjoyed the insights occurring when a theologian friend has said something I recognize as meaningful (and worth further thought), but which I am unable to perceive unaided.

In the extreme, waxing and waning of theism may be causally related to massively disruptive historical cycles of civilization; perhaps with something like cognitive theism these long-wavelength cycles might be replaced by much higher-frequency, lower-amplitude cycles in which single individuals lend themselves alternately to theistic and secular traditions, for an equally creative but less destructive set of results.

#### SECULAR CONTRIBUTIONS TO COMMUNITY

I do not systematically consider the many possible sources of social unification and fecundity besides religion, but they should be briefly acknowledged. They include places and times when burgeoning wealth is used well, times of constructively democratic political activities, networking of acquaintances, unusually effective personal altruism (Burhoe 1974), good libraries, thriving urban environments or suburban environments (Ebner 1988), clubs devoted to mutual interests, families' participation in aspects of schooling or extracurricular organizations, town athletic leagues, and so forth. Good social activities often nurture growth of community beyond the declared purposes of the groups. Some of these activities acquire aspects of ritual reminiscent of religion, such as Boy Scouts' honor ceremonies and school graduations; for families living in culturally diversified healthy communi-

ties, such ritual may well serve a social integrative function that is inaccessible from within their respective religions.

As surprising as the positive functions of religion may be to an impatient secularist, an impatient democrat may find surprising the idea that monarchies or aristocracies have sometimes been good places for liberty (see Tocqueville 1835; Alulis 1993). Perhaps this is because they are less likely to have a tyranny of the majority or are better able to control the factionalism which the *Federalist Papers* no. 10 and no. 51 of Madison, Jay, and Hamilton strove to resolve for democratic America, and which is reasserting itself in today's climate of litigiousness (Hughes 1993; Schlesinger 1992). Indeed, it is conceivable that Thomas Jefferson's learned sense of class was as important to him as the momentum of religious tradition, even as this premier Democratic-Republican debated Federalist colleagues, who favored a more aristocratic form of government (Padover 1970, 79, 106-12).

Throughout history, intellectuals have tried to remake society along improved rational lines (Sadri 1992). With popular culture in its turn, television, film, and other stimulus-intense media cause both social unification and hostile fragmentation. For example, this is true of rock music (Kot 1995a). Eulogies at the passing of Grateful Dead band leader Jerry Garcia referred to his eclectic mixing of familiar material with inspired improvisation (Kot 1995b; the high praise rather resembles some commentaries in the theology of continuing creation). Professional sports provide an endless source of friendly conversation; because they are safely removed from the real alliances and conflicts of our lives, they provide open routes of return to each other. Public television and inspirational films (in 1995, *Forrest Gump*) also can play unifying roles. A final example of a secular contribution to community is money. Although the love of money is the proverbial root of all evil, that is merely the shadow side of the vital role played by a medium of exchange and a free economy in the growth and sustenance of civilization.

How well does religion mix with secular contributions to community? We have to keep experimenting. Yet, as we rationalize and convert the currently presumed functions of religion into a secular menu, we may trim these functions into shallow nostrums with a short life span. This is the sort of difficulty that is sometimes seen in secular popular psychology as well as in the neopolytheisms of New Age religious thought. Is our wisdom as intellectuals today more attuned to the subtleties of the task of developing a cognitive theism than was the religious assertiveness of that prototypically shallow fictional American, George Babbitt? Babbitt downgraded Beethoven because his music is hard to whistle and justified churchgoing in terms of its pragmatic spinoffs in the improvement of business associa-

tions and profitability (Lewis 1922).

Perceptive observers of Western society have urged reevaluation of the separation of religion from secular life (Campbell 1991). According to Burhoe,

The rescue from serious decline and fall cannot be done adequately by ethical preachments devoid of the religious or inner motivation necessary for the feelings and behavior to carry them out. Philosophies do not replace religions unless they succeed in also becoming religious enough to generate motivation as well as ideas. The rescue cannot be done by political agreements, [or] international or national laws, [or economic systems, alone]. Religion is the name of the sociocultural agency [that can motivate] human minds inwardly [and] raises them to the necessary altruism that vitalizes a cooperating society of nonkin. (Burhoe 1987, 16)

By no means does Burhoe advocate theocracy, however. In attempting to pursue Burhoe's program here thus far, I have explained, in this section about memory, how human rational coping is subject to a number of severe restrictions and quirks of conscious capacity. Mind expansion can therefore be an adaptive strategy. But what are the most valuable sources of information to risk opening ourselves to and how can we limit our vulnerability? The many sources of a secular civilization's memory affect individuals in a wide variety of ways, but there is reason to hypothesize that religion, and indeed theism, may contribute as an important repository of wisdom, even in the most secular societies. Questions of credibility raised by this hypothesis are addressed in the following three sections, on the psychology of gestalt effects in object perception, on ubiquitous large and small "modularity" in human personality and other living systems, and on the peculiar expansiveness of motivation.

#### THE PSYCHOLOGY OF PERCEPTION: OBJECT HYPOTHESIS WRIT LARGE

Moving from the hypothesis that religion is functional to the premise that God is real is an awkward leap for intellectuals. It requires a plausible apology, even for the occasional thought experiment. An analogy that emphasizes holistic patterns, from the psychology of perception, may help effect a mental transition from the conjecture that there is a growing coherence within the totality of purposive interactions of human beings with the world to a tentative ontology of one God.

*A Musical Model.* An example from auditory perception, an issue in the philosophy of music, may serve here as a preliminary model of this theological issue: Ordinary appreciative listeners hear a piece of music as having properties objectively present in the music itself. Some

cultural relativity in musical experience cannot be denied, but more important is an underlying invariance of pattern that reaches the perceptions and emotions of all who hear a piece of good music. At the level of microcomponents of music, there is cross-cultural invariance in the low-integer ratios that determine harmony and the octave (Levenson 1994; Rossing 1990; Pierce 1992, Eibl-Eibesfeldt 1989, 690–96). More important for present purposes, at a higher level of patterns it seems closer to the truth to say, for example, of the opening measures of Beethoven's Third Symphony, "the music is heroic" rather than "it elicits heroic feelings in me personally." Philosophers Forest Hansen (1989) and Kingsley Price (1981) have explained well the inadequacy of excessively locating the meaning of music in the listener.

*Hard Visual Objects.* It is primarily by way of visual perception that we reach out past the flux of sense impressions to cognize a full world of objects. The problem of actually describing the perceptual invariances that give us our compelling sense of the external world's objects remains a central enigma of psychology. So amazing is this perceptual competency of organisms that scientists, when not cultivating appreciation in consciously studying the ability, have often lost faith in it, thereby seriously underestimating the value of qualitative observational research. Caught in an error of accepting the hard reality of each tree while doubting the larger reality of the forest, many scientists too often use instruments to quantify minutiae while missing the bigger picture (Campbell 1988; Lorenz [1959] 1971; Glassman 1978, 1994). Overall this may be a pretty good thing if it is true that the large mass of science workers lacks the judgment to apprehend larger patterns, but such reflexive, blind parsimony also exacerbates the divide between scientists and others and bears importantly on the issues of this article.<sup>3</sup>

Perceptual constancy has long been studied in psychology, and more recently in neuroscience (e.g., see Carlson 1991; Hochberg 1972a; De Weerd et al. 1993; Levinthal 1990; Matlin and Foley 1992; Milner 1970; and especially Gregory 1990), robotics, and neural network theory (Anderson and Rosenfeld 1988; Caudill and Butler 1990). Constancy is usually illustrated by means of straightforward visual phenomena: We easily, automatically recognize an object (such as a chair, or our hand, or a dinner plate) in spite of the fact that with different distances, angles of regard, and illuminations, it casts very different stimulus images on the retina. With the cohesively bounded typical physical objects of everyday life, we only occasionally are fooled by illusions. Perception usually leads us quickly to *object hypotheses* (Gregory 1990) that prove valid; the deliberate demonstration of illusions such as reversible figures simply helps to elucidate the nature of our remarkable perceptual gifts.

The objects of daily existence play upon our senses in highly predictable, convergent ways as we "triangulate" (Campbell 1988) by walking around them, handling them, and engaging in other routine observational actions. Of course, this is not true only with vision and touch. In hearing, too, we have the remarkable capacity to automatically reach out past the flux of sense impressions. For example, we easily identify a word spoken by different voices and therefore using very different sets of vibrational frequencies of sound (Matlin and Foley 1992). Some of the most exciting current work in neuroscience concerns the hypothesis that brain wave synchrony is responsible for binding the attributes of a stimulus object into a whole, as these attributes resonate with neurons in different brain locations that are separately responsive to the various features (e.g., Singer 1993).

*God Perception as Good Gestalt? Hypothetical Extension to Coherences in Social Life.* In the world of social life it is much more difficult than in the world of physical objects for observers to reach stability in converging upon perceptual gestalts. Much of social life is like the Necker cube or other ambiguous, reversible figures. This is particularly true when extrapolating to the future. Yet our social cognition (Schneider 1991) is ultimately founded in many of the same mental abilities as our other cognitions. Here is the payoff of this argument: Secular intellectuals might grant the possibility of legitimacy to a God-object hypothesis, as the hypothesized coherence of pattern behind a large selection of life's experiences that are broadly distributed within our lives. (As a secularist, I wish to be careful about how I develop the idea of God's purposes in this analogy; in part or whole, it must be an emergent property of the best of human intentionality in social organization. However, as I review this very page of the copy-edited manuscript, the DC-10 in which I am traveling is passing over the Grand Canyon. This is awe-inspiring, and humbling in regard to human purpose. I will not pursue this further now.) Another comparison is with those cleverly designed arrays of dots that are perceived as a compelling pattern only after you study them or stare at them for some time. The idea of gestalt perception of God is a hopeful analogy with the visual phenomena that were first brought to public attention by the Gestalt psychologists of the 1920s and 1930s (Hochberg 1972b includes many illustrative figures).

To view the God-object hypothesis as legitimate is to grant a great deal. What I am *not* hypothesizing here is merely that theists are cultivating belief, based on the local faith sources of their parents and neighbors. And while the emotional components of religion are important, I am also not hypothesizing that theists are merely having an oceanic mystical experience. (That is too easy to cultivate by tricks of

mental self-stimulation or to simulate with drugs.) My hypothesis is that the perceptive theist may actually be having a perceptual experience, and indeed one that is grounded in virtually the same sense as all of us can easily see an object.

Our gift of vision includes not only our eyes, whose probable course of biological evolution Darwin described so exquisitely, but also the marvelous neural system that goes with eyes. The one million neurons in each of the two optic nerves comprise most of our sensory neurons, by far. The visual system also includes hundreds of millions of neurons in the primary visual cortex. On the strength of the internal connectivity and dynamic physiology of this system, we easily and naturally perceive the separateness and invariance of an object across all the proximate sensory transformations that occur as we move closer to it or farther from it, change our angle of regard, view it in dimmer light, and so forth.

But some objects and patterns are more difficult to see than others. Any biological scientists who have become proficient in the microscopic examination of tissues know that they can quickly see a remarkable (and often pleasing) organization of specific complex forms where a novice sees only a boring jumble of disconnected forms and colors. Good athletes do something equally impressive under conditions of dynamic sources of proximate stimuli. They see where the ball or other object of play is going, and they dance with it successfully. Admittedly, it is a big leap of analogy from this to the hypothesis that a perceptive theist can in a similiar sense perceive God; but we are constantly confronted with examples of people whose skills are wonderful at things the rest of us can only dream of doing. We secularists simply do not know whether there are theists who genuinely have such a form of expertise. Perhaps there are.

TUNING THE SPIRIT-FLESH BALANCE IN ACCELERATED BIOCULTURAL EVOLUTION. The preceding paragraphs suggest that exercises in cognitive theism might possibly assist more people to genuine perceptions of religious meaning, if not perceptions of God. The contemporary widespread lack of perceived religious meaning may be understandable by analogy with pathological mismatches of incoming sensory information that lead to a breaking up of our necessary (and comforting) visual grasp of the world of solid objects. Some examples of such breaking up are the various neurological causes of double vision; another is the mismatch of vestibular information with visual field of view, which leads to motion sickness (Hettinger, Nolan, and Kennedy 1987). The sort of information mismatch that might lead to a breakup of religious meaning involves the twin processes of biological and cultural evolution. These processes normally operate on two very differ-

ent timescales, both of which are much longer than those of the visual perception processes that we are using in analogy.

Human biological and cultural evolution involves two great, evolving streams of information, each with its natural material substrate: (1) *genes* and (2) the diverse objects and dynamics of *culture*—spoken language, art objects, books, electronic media, people setting examples, colleges, and so forth, all these phenomena making their impressions upon and receiving impressions from our genetically founded human brains. Major adaptive change in genetic evolution has occurred on a generational timescale much slower than the typical creative essays and adjustments of cultural evolution, ever since cultural evolution emerged as a partner; but a central question concerns the tuning of the relative pace of change in genetic and cultural evolution. With talk about timescales, it is useful to return to musical metaphors. Although this view is somewhat too predestinarian, it is reasonable to analogize that historically, the relative pace of biological and cultural evolution has been fairly consonant, but now humans must adapt to a tension, or dissonance, between biological and cultural evolution. Today, however, the dissonance or mismatch may be greater than ever before.

To clarify this metaphor: On the piano, the note C below middle C has a frequency of 130.81 Hz (waves per second). This note is perfectly consonant with any other C, as all notes of the same letter designation bear the octave relationship of having frequencies exactly related by powers of 2 (half, double, quadruple, and so forth). Thus, for example, the frequency of middle C is 261.63 Hz (with rounding error in the last decimal place), C above middle C has a frequency of 523.25 Hz, and so on (Pierce 1992, 19). When these notes are played together, the phase relationships of the vibrations remain perfectly consonant or, speaking a little loosely (disregarding constant phase differences), the waves remain in “perfect synchrony.” Note that this is so even though the time scale of high-pitched sounds is much finer, with many more waves per second. Similarly, notes that are consonant *within* a single octave—e.g., middle C (261.63 Hz) and F in the same octave (349.23 Hz on the equally tempered scale [Pierce 1992, 68]) at the major fourth interval—are equally consonant with notes of the same letter designation in other octaves, even though those notes’ repetitive “events” (i.e., the sound waves) are occurring on different time scales. For instance F two octaves above the middle octave has a frequency exactly four times that of “middle F” (1,396.9 Hz) and is consonant with middle C.

In a melody, aesthetically pleasing new consonances often emerge following limited brief dissonances. It is such a pattern of events that may be used as a metaphor for the relationship between the well-winnowed (albeit imperfect) “harmonies,” produced as biological evolution

rearranges the subsystems of organisms, and the more rapid, higher-pitched evolving counterpoint of culture. But the severe biocultural mismatch of today's postmodern era might be conceptualized in the extreme as the left hand playing in the lowest octave of the piano while the right plays a different, and poorly organized, sequence of notes in the highest octave.

The speed of genetic evolution depends on the rates of mutations at various loci, sexual recombination in populations of varying sizes and permeabilities to immigration, the length and number of chromosomes in the human species, the reliability of DNA self-repair, and other factors. There is a larger set of diverse processes by which the cultural information stream evolves. One intriguing unanswered question about relative tuning concerns the matter discussed previously, why long-term memory is guarded by an editorial bottleneck in working memory of  $7 \pm 2$  items. The generality of this figure across individuals and species suggests that it is a fundamental innate mammalian constant. Underlying the aggregate of evolutionary mechanisms is the same general systems issue of how stabilities and change processes coexist in appropriate balances within the semiorderly/semichaotic process (Horgan 1995; Polkinghorne 1991). How is it that the relative rates of change remain such that life neither freezes in stultification nor crumbles in helter-skelter alterations?

*Culture, Spirit, and Downward Causation.* Culture cannot exist unless it maintains its human protoplasmic vessels. As Garrett Hardin (e.g., 1982) explains in his superb essays on ecological responsibility, it is a logical necessity for altruism eventually to feed back, however indirectly, to help sustain the substrate of genetic information from which it emerged. "Promiscuous altruism" is ultimately suicidal. However, this reasoning may overlook an important complex possibility.

In civilization, human protoplasmic vessels are so *populous, diverse, and intermingled* that culture virtually has a life of its own—as if it were spirit—with no exclusive dependencies on any narrowly circumscribed subset of human flesh. A very limited analogy concerns the way a flame seems to maintain a certain identity, or to metamorphose interestingly, as it passes from one combustible substrate to others; however, flames tend to destroy the matter upon which they ride, whereas when we humans pass ideas to each other, this can sometimes have very constructive effects. *Downward causation* in this context means that while ideas and their constructive effects have their primary existence at the levels of individuals and society, they are the causes of reorganizations at all the supporting ontological levels below these. For example, our individual neurons must undergo concerted changes as our whole selves inten-

tionally learn. Another important example of downward causation is in the way the evolution of human culture strongly alters the environment within which biological evolution takes place, thereby changing the genes (Campbell 1974). I will say more later about this sort of interaction in pursuing Burhoe's central idea about the organization of human genes and culture.

An infusion of spirit, in the ready sharing of information or in proselytizing (Glassman 1980; Glassman, Packel, and Brown 1986), can turn out to be good or bad. Religion, for example, bears cultural information that spans the horizons of comprehension and rational planning of individuals and groups. (We must all pay a tithe from our rational capacity to faith in behavioral patterns of an identified trusted community.) When functioning in a good way, religion sustains limited, healthy degrees of valuing of its human vessels and their material resources. Religions facilitate a global human cultural reach that constantly builds more and more potential from widespread sources into local substrates. Thus informed, those substrates have their chance to propagate or expire. This process of funneling absorption, if successful, pulsates with Teilhardian *becoming* (Schmitz-Moorman 1995) of newness and a wider distribution of emergent information.

*Tempering the Pace of Change and the Centralization of Power.* West-erners have a habit of overestimating the pace of progress. Journalistic popularizations of science make it seem as if the doorway to the future has just opened. However, as Thorstein Veblen once wryly noted of American culture, changing fashions always *seem* like progress. The clothes fashions of a few years ago seem hopelessly quaint and those of today to be the spearhead; yet over the eons clothing has not gotten more effective at its ostensible purpose (Veblen 1899, chap. 7, esp. p. 174). Something else is going on. The adaptive function of this game of optimistic futurism may be as a secular surrogate for one function of religious spirituality; it may motivate our continual search, which enables genuinely new good things sometimes to occur, albeit less often than in our upbeat illusions. Nevertheless, history does really move somewhat faster today, when an instant on the telephone or on e-mail replaces the days on the pony express or the weeks on a fast oceangoing vessel that represented the limiting velocities of communication barely more than a century ago.

Under these conditions, it seems likely that the parameters of traditions are no longer calibrated well to help regulate the pace of cultural evolution. Indeed, standard human longevity no longer can perform its naturally selected function of enabling cultural transmission from the older to the younger (Diamond 1992, 64, 123) very well. In this go-go environment in which adolescents command much of the media, they have less opportu-

nity to attend to elders' encouragements and doubts. The vacuousness of today's relativisms may be a result of these temporal miscalibrations. People are missing the opportunity for their perception to converge on reality. Young people cannot make very meaningful choices when they understand little of the traditions of *any* culture, let alone their own, and when their attention is so often absorbed in ever-changing, stimulus-intense phenomena. This relative loss of cultural bridging patterns, which change on a timescale between that of the life of a single individual and that of the genetic evolution of a species, leaves a schism that may also be responsible for the widespread erroneous, dichotomous view that our instincts are basically base while culture is basically elevated.

*Grasping Reality.* These considerations imply that the proposal for a cognitive theism is less an arrogant gamble than a salvage operation of testing the adaptive patterns of the Judeo-Christian tradition in the new secular contexts that are swarming upon us. It is those secular contexts that contain the greater risks of arrogance leading to stumbling. Many intellectuals believe that human beings are above all *makers of meaning*. As Hefner (1993) has clearly acknowledged, we certainly are that, but as he and Burhoe (1981) have insisted, meaning should not—and indeed in the long run *cannot*—be made without soliciting agreement from the larger reality of nature that is, in part, separate from any human individual.

The incorrigible limits to human foresight and an individual's zest for manipulation and control were dramatized beautifully by Goethe in his version of the Faust story (Kaufmann 1961; May 1991); this idea has been made manifest again in contemporary times in the metaphors of complexity theory (Horgan 1995; Polkinghorne 1991) and in the frequent psychotherapeutic advice and popular self-help advice to relinquish some of one's control or not be such a "control freak," to take one day at a time and so forth. A thoroughly secular form of self-controlling self-talk exercises is sometimes part of this sort of psychotherapeutic operation and thus comprises a peculiar exception to the normal rule that talking to oneself is crazy. Another demonstration is solitary prayer. Prayer takes our supremely human ability to use language—perhaps the one most associated with human control of the environment and with the "enchanted circle" of human gene-culture coevolution (Lumsden and Wilson 1983; Deacon 1992)—and in the most powerful implicit way declares "I acknowledge my limits," while refreshing important adaptive cultural information that has evolved on a long timescale.

Today our senses are inundated not so much by towering golden icons (Dan. 3) as by electronic visual and auditory media. Modern hyperfast communicative technologies challenge the adaptive inertia of traditions. On the other hand, they also make possible new mechanisms

of critical checks from larger communities. Perhaps we can transcend our parochial purviews, uncouple the adaptive aspects of religion from obsolescent motifs, and nudge these valuable aspects of it toward better contact with future issues. But again we have to be careful with such ambitions. Globalization compromises the diversity of evolutionary "experiments" that until recently have been uncoupled. From here on, humankind will win or lose in much larger fell swoops.

Thus far in this paper I have discussed how human memory and perception have both capabilities and limitations that are ordinarily largely invisible. The healthy longevity of our secular society, which is enthusiastic about individuality and newness, may run afoul of the limitations, but perhaps not if we improve our strategies for tapping our perceptual and memory capabilities in ways that are attuned to larger and more enduring patterns. I propose a controlled partial suspension of disbelief about Western religious traditions as a way to accomplish such mind expansion. In the following section I suggest a different naturalistic reason for experimenting with theism. After drawing a parallel between the modular functional diversity that is pervasively characteristic of any individual's mind and brain, and widespread approximations to purpose in living subsystems of every variety, I call attention to the fact that in everyday life human agency (another module?) brings our modules together sufficiently to achieve a fair behavioral unity. I suggest that theism is an extension of this characteristic, and then make further suggestions about how lending ourselves to the attractiveness of religious stories and of the mythical figures they describe may use culturally evolved information in a way that maximizes the effective capacities of memory and perception.

THE PSYCHOLOGY OF PERSONALITY: INTENTIONALITY AND THE  
ACHIEVEMENT OF COHERENCES AMONG DISTRIBUTED  
MODULAR SUBSYSTEMS

For adventuresome secularists, exercises in using a language of theism will require holding skepticism at bay. Genuine theism, with personal pronouns, requires finding truth in the idea that nature has an overall singular personal quality. There has to be a reasonable way to protect this perception in some dimensions of thought from the secularist sense of the world. (See Busse 1993 for an excellent brief perspective on personal god concepts.)

ORGANISMIC FEEDBACK LOOPS AS FRAGMENTS OF INTENTION.  
Does nature have a quality that is viewable in one way as transcenden-

tally intentional? A scientist's apology for theism might begin with a limited pantheism arising from the twin facts that (1) living organisms of one size or another penetrate every cranny of the earth's surface and (2) regulatory functions are ubiquitous in living systems, in both groups of organisms and parts of organisms.

Regulatory functions always have at least an aspect of purposiveness. Going beyond the widespread mechanical metaphors in recent scientific history of a few decades ago, example after example has been discovered, in biology, of systems and subsystems characterized by criterial aspects, specialized sensing elements, negative feedback, and often properties of heuristically guided seeking or feedforward anticipation. Thus, in living systems, properties of the parts reflect much more of the intention-driven whole than we used to think (also see Glassman 1978 for an application of this idea to the fallacy of excessively rigid mechanistic localizationism in studying the brain). What neophyte theists who are also scientists might do with this fact has to bear a certain reserve, because all these systems are deterministically understandable in terms of physical causes and system components. Their approximations to foresight have limited horizons, which perhaps are inevitably more adapted to past selection factors than to the futures into which they are reaching. It would be unbecoming of us to soar off into a foggy sky with an overview that has lost the distinction between biological analysis and animism. With that caveat, let us continue exploring.

*Neuronal Example.* Individual neurons have many aspects of self-regulation as they participate in larger systems. One such aspect is the amount of time a particular neurotransmitter chemical remains in its synapses after being emitted. This micropurposive process involves tiny sites on the neuronal membrane near its terminal, called autoreceptors, which are specifically sensitive to the neurotransmitter emitted by that very neuron (Bear et al. 1996; Dowling 1992; Shepherd 1990). Autoreceptors enable a neuron to listen to itself as it speaks, in its simple code of pulsed releases of a chemical. The importance to organismic function of microprocesses of this general sort is illustrated in one way by the efficacy of the class of antidepressant drugs that work by extending the time that the neuromodulators norepinephrine and/or serotonin remain in their synapses before being resorbed into the terminals of the transmitting neurons (e.g., imipramine [Tofranil] or fluoxetine [Prozac]). This is an apt illustration for the present argument because the resultant positive effect on mood, when things work well, both enhances the sense of purpose of the whole human individual and increases success and self-perception of success in many instrumental activities (Kramer 1993; Restak 1994). Thus, in this case modulation of a feedback system at a micro level is virtually reflected directly as an

analogous modulation of a feedback system at the organismic level.

One problem is that the selective serotonin reuptake inhibitor (SSRI) drugs sometimes work so well that they (or the gods of serotonin synapses?) are virtually worshiped by some users and health professionals. Much media controversy is underway about "cosmetic psychopharmacology," used not to alleviate a manifest illness but to try to brighten the social self-presentations of normal people (Kramer 1993 and many reviews of this book). Although antidepressant drugs are a life-preserving necessity for many individuals during parts of their lives, we may well wonder whether when painted broadly across a whole society they usurp a proper regulatory function of unfortunately waning social institutions—for example, religion. Imagine the flatness of affect of a society whose mood is constantly pressed against the smiling and hearty end of its dynamic range ("Thanks for choosing us, and have a nice day") striving by pharmacological main force to hustle natural selection by accelerating the assimilation of a contemporary social style into a permanently deepened hue of all the serotonin threads in its brains' fabrics. Two empirical predictions are that we may begin to see more errors made by nonchalant leaders of organizations, and that aging individuals whose nonchalance is undermodulated by apprehension of circumstances (or the apprehension of an alertly monitoring psychotherapist, pastor, or friend) will take greater risks and exert more daily energy; possible statistical outcomes are increased incidence of accidents, hypertension, and so forth. On the other hand, these may be excessive worries; can it be that SSRIs represent a sweeping evolutionary advance in human intentionality, now to become locked into the cultural stream of information by tapping our biological nature deeply? It would be good to be careful.

Psychiatry and psychotherapy need to become somewhat less tactical and more involved with larger meanings. One part of this strategy should involve careful examination of how people are affected both cognitively and emotionally by the central stories of the Judeo-Christian tradition and other religions. Thus, for example, the details of the death and resurrection of Jesus may stand for aspects of our own lives (e.g., "bearing the cross") and may sometimes be more effective than any antidepressant drug in organizing the sense of hope of a member of a religious community who succeeds in belief and who is invested in worship.

*Emergence of Earth Purpose?* In discussing the subsystems of living systems it is often convenient to talk (punctuating with sheepish grins and mimed quotations marks) in terms of what particular subsystems "want to do" or "are trying to do" in various cooperations or conflicts. With the Gaia hypothesis (Mann 1991; Margulis 1993) some scientists

already find plausibility in the risky extrapolation from such epistemological pellets to planetary phenomena. Recalling the notion of *unfolding*, for example, as in the thought of Bohm (Sharpe 1990) or Teilhard (Schmitz-Moorman 1995), it is conceivable that all the earth's diverse, seething purposive systems, and quasi-purposive subsystems with living components, are gradually feeling their way—by natural selection—to a set of supple linkages of a higher order that are in part outside of human intentions. Whether or not this is possible depends on the logic of the units-of-selection controversy. Very briefly, components must derive sufficient local advantage from membership in a larger system, or larger systems that chance to converge must have properties that somehow overcome the selfish tendencies of the components, without progressively depleting the sustenance of those components.

IS MIND MODULAR? PERSONAL AGENCY AND LITTLE AGENTS. A related secular source of plausibility for a personal God concept is in an analogy between the belief in God and the belief in oneself, or *I*. Aspects of modern psychology have been steadily eroding the *I*, perhaps in much the same way that science has seemed to leave little room for God. The concept of *personal responsibility*, with a localized center of action, has given way widely in popular opinion (e.g., Kaminer 1995), social science, the law, and brain science to a view of the pervasiveness of *diverse causation* in all human actions. (Wright [1994] excellently describes a source of this problem in the Darwinian revolution.) This way of thinking has both valid and problematical aspects.

*A Continuum of Theoretical Types.* Theories of this type may be represented along a continuum depending on whether the constitutive elements are many and tiny; few, large, and complex; or somewhere between these extremes. Examples of the first genre are in current theories of *parallel processing* and *distributed processing* that emphasize simplified neuronal elements. Distributed neuronal processing is sometimes thought of as involving an analogy between the suborganismic level and a democratic political system. Groups of interconnected units are thus sometimes viewed as engaging in a kind of massive voting process, by spatial summation; this may involve thousands of simple elements. The "selfish gene" principle in sociobiology (Dawkins 1989; Burhoe 1979) is another example of a theory of populous microelements each of which might yet be thought of as having a small aspect of intentionality. In partial contrast with neural network theories, in cognitive psychology, network theories comprise fewer and larger elements, with the nodes representing words or other conceptual units and the links among nodes representing associations among these units.

An example at the other end of the continuum is Freud's venerable

tripartite conceptual decomposition of the personality into id, ego, and superego. Each subsystem is a sort of reduced almost-whole human being. MacLean's (1982) theory of the tripartite "triune" brain is based more on neurology than is Freud's theory. Where Freud had three competing/cooperating systems of approximately equal power, MacLean has three hierarchical levels of complexity and dominance, with (1) simple adaptive behavioral fragments at the bottom, (2) an intermediate level of organization with animal-like emotions, and (3) cortically dependent intelligent behavior at the top. All three systems are somewhat willful, with overall organization depending on both tonic top-down inhibition and orchestrations of controlled phasic release from inhibition. In such a scheme, abnormalities of function may take the form of *release phenomena*, in which the more primitive behaviors that are organized at lower levels no longer have sufficient tonic modulating inhibition from above. In a much earlier hierarchical theory of the nervous system, the British neurologist John Hughlings Jackson ([1887] 1958) drew an analogy between a "devolved" malfunctioning brain and a Navy command that is missing its top officers, so that exuberant lower levels are released.

I once suggested a tripartite hierarchical "three-echelon" theory; it is analogous to MacLean's triune brain theory but puts less emphasis on emotion, as embodied in a limbic-system middle level, and more emphasis on movement and cognition, embodied in the basal ganglia viewed as a middle level. Conceived in the Jacksonian mold, the purpose of this theory was to explain phenomena of schizophrenia and of motor side effects of neuroleptic drugs, in terms of the neurological principle of release, from higher-level control, of subsystems that have a degree of autonomous intentionality (Glassman 1976). Thus, following some earlier theorists, I envisioned schizophrenia as a sort of reduced functioning of the frontal cortex. This "weakness" was hypothesized to allow the natural, partial autonomy of the subcortical basal ganglia to become manifest in stereotypes of movement and thought, which are some of the typical symptoms of schizophrenia.

The antidopaminergic effect of neuroleptic drugs was hypothesized to put things in better balance by dampening the relevant activity of the basal ganglia, but this continuous suppression, chronically imposed with the regular therapeutic administration of neuroleptics, was envisioned as in its turn eventually releasing the simpler, automatic oral movement fragments of the iatrogenic disorder known as tardive dyskinesia.

In an experimental outcome consistent with this theory, when a neuroleptic was administered chronically in the drinking water of laboratory rats, they developed spontaneous "vacuous chewing movements"

only if the frontal cortex had also been experimentally abated (in some cases with additional encroachment into the basal ganglia; Glassman and Glassman 1980). In an interesting small episode in the history of science, many subsequent experiments in other laboratories have since replicated the finding of vacuous chewing movements in rats under a variety of conditions involving long- or short-term administration of different neurotransmitter agonists and antagonists and explorations of various loci in the basal ganglia; however, the Jacksonian hypothesis that motivated our study has not been picked up by others.

Between theories of *many-simple-small* and theories of *few-complex-large* are theories having *intermediate* numbers of *intermediately* sized quasi-intentional subsystems. For example, computer scientist Marvin Minsky's amateur psychology uses the convenient term *agents* to characterize somewhat-complex subsystems (Minsky 1986; Williams 1987). The concept of little mental agents contrasts with the idea of an overall sense of *agency* of a whole human *I* as studied by personality theorists (Rychlak 1979, 1981, 282).<sup>4</sup>

Carl Jung's conceptualization of innate archetypes comprises a particularly interesting theory of midsized agents. Each Jungian archetype is a hypothesized subpersonality which strives to command our urges and our criteria: for example, "hero," "earth mother," and many others (Jung 1964). Although a potted version of the theories of psychoanalytic "Father Freud" regularly takes its limited, stylized place in general psychology textbooks (sometimes as a straw man), Jung's theory of archetypes has important features whose continued downplay in mainstream psychology impairs our ability to understand real human lives. A few biopsychologists have held Jung's pantheistic mysticism to the side while capturing his ideas about archetypes in a way consistent with good biological science (Stevens 1983; d'Aquili 1986; also see Glassman 1983).

In contrast, the various trait theories in the heavily quantitative subareas of mainstream psychology devoted to personality and intelligence tend to convey a mechanical and passive quality in the midsized subsystems into which an individual is conceptually decomposed. This may be related to the static character of the paper-and-pencil inventories which elicit the primary statistics (see, e.g., Hall and Lindzey 1978). Such data collection contrasts with the interactive psychotherapy setting from whose events come much of the evidence for the psychoanalytic personality theories of Freud, Jung, and many followers. However, some of the traits in trait theories do retain traces of intentionality; this may be greatest in those theories that have fewer, more complex elements, such as Gardner's (1983) theory of seven "multiple intelligences." Additional discussions of modular characteristics of mind and brain are

those of Gazzaniga (1989), Ornstein (1986), and Sternberg and Wagner (1993, and articles that follow in the same journal issue).

At least one justification of agent or module theories is clear enough to common sense: At different times we are possessed by different moods or lines of thought. However, theories of modules may not by themselves distinguish between normality and schizophrenia, or between adulthood and immaturity, unless there are special integrating functions or modules, as, for example, with Jung's archetype of the Self. In the extreme, the neglect of overall personal agency and responsibility, when these important theories tend to concentrate on semiautonomous components, reminds me of some of the adolescent hormonal jostling that used to go on during my childhood in New York City (and may still). One boy would give a playful punch in the arm to another and then quickly assert in mock innocence "I didn't do it. My *hand* did it!"

*Fictions that Unify Human Intentionality.* Peacocke (1991) has suggested a parallel between the transcendence attributed to God's agency and the sort of transcendence of the particular also seen in the best examples of human intentionality and action. In Exodus the analogy between self and God is highlighted by God's parsimonious, self-identifying pronouncement to Moses, "I am that I am" (Exod. 3:14). Later the somewhat "stiffnecked" community members are encouraged to believe themselves made in the image of one God. All community members are to give parts of themselves over to a larger plan, thus imposing a coherent unity of purpose upon a future filled with multiplicity and challenge.

On the smaller scale, and critically necessary within a single lifespan, an individual occupant of a human skin must arrive at a set of agreements within himself and with other individuals about priorities and strategies. In both cases there must be varieties of commitment; there must be sufficient roominess for evolution but not too much capriciousness or slackness of linkage. *I* may be a fiction but *I* am probably necessary to the complex of subsystems within my meninges and my ménage. Human integrity and mental health require the routine suspension of disbelief about the *I* fiction, thereby sometimes turning it into a reality.

RELIGION-AESTHETICS INTEGRATE HUMAN PERCEPTION WITH ACTION. The potential integrity in human action, together with an additional secular source of plausibility for theism, may be understood in terms of the truth that is in beauty. While aesthetic judgments are quite conscious, much of their substructure is outside of our awareness. We often are mute about the reasons we think something is beautiful, yet it seems reasonable to presume that such judgments normally represent a meaningful cumulation from our nature and nurture.

An ontology seems to be implied by aesthetic excellence. I suggested previously that musical works have objective properties rather than merely relativistic interaction effects with individual listeners. A deeper implication of truth in beauty often has been noted by philosophers of science when they have mused about the elegance of any good theory. Like the poet Keats's beautifully constructed urn, good theories have the ability to bring coherence to an otherwise puzzling array of phenomena.

Religious emotions often are engaged by way of aesthetic sensitivities, for example, when experiencing religious music, paintings, or architecture, a compelling religious oration, extravagant or subtle films about biblical stories, or when quietly reading some of these stories. These experiences may be compelling because of the way they engage the brain. In the right hemisphere of the brain, more widely diffused neuronal connectivity seems more concerned with our senses of location and orientation, emotion, and aesthetics. This combines with the functions of the more specific local connectivity of the more linearly logical left hemisphere (Springer and Deutsch 1993). When something that is aesthetically pleasing leads to directed thought or action, this must engage the capacities of both halves of the brain, with vigorous informational traffic across the connecting corpus callosum.

Religious emotions, among them security, joy, fear, and inspiration, are linked with the aesthetics of the ritualized responses and varied sources of stimuli in religious practice. The resulting experience may provide partial foundations for us to creatively feel our way along trajectories to the future at a pace that suits our human capacities. Shared religious experience yields community. Solicitation of support from other individuals is standardized in religious rituals and, if there is sufficient freedom, the ritual can become an eager invocation of colleagues' shares of the community's wisdom.

When things work well, the pace of change in a good community gives each person room to live; yet individuals need each other more than we tend to realize in this nation of individualists. By all the little things we do together, we cover each other's lapses; we constantly remind each other and jointly explore what looks good, what makes sense, and what there is to smile at in rejection or in welcome. In a community of shared customs and values, there is less necessity than in formal organizations for explicitly polling colleagues and for legalistic reasoning. There is richness and subtlety of social life. In a community that is working well, individuals who are hungry for successes can more easily feel valued while awaiting their respective moments, confident both that higher purpose exists and that the availability of their particular competencies is important to others. Times may arise again when

one's abilities happen to fit potentialities in the situation well. In the meantime, reassurances are concise and sure.

*A Calculated Big Risk: Cognitive Neocreationism.* The biblical stories about creation comprise beautiful, engaging literature, yet creationism does not belong in the same classroom as evolutionary biology (e.g., deLama 1993; Root-Bernstein 1995). If scientists were to risk acknowledging a kind of truth in the beauty of the biblical creation stories, this breach would pose the serious danger of fuzzing a distinction that is crucial in science education. Should such a risk be taken?

A suspension of disbelief here is made less lightly than when we read acknowledged fiction or when at the theater. The Genesis 1 and 2 creation stories bear important packages of implicit social information, which are most effectively orchestrated in apposition to cosmic and primordial images. These myths mark central aspects of civilization. They dramatically and efficiently code a set of imperatives; for example (Gen. 1), to value the earth, the light in the sky, sources of water, the varied forms of matter and energy that surround us, the diversity of life, and the opportunities we are provisionally granted by these phenomena; and (Gen. 2) that a man and woman, although sometimes seriously confounding to each other, are made of the same stuff and had best try to get along if they hope to thrive on a challenging earth. Such good advice tends to get lost with the bathwater of disregarded, disrespected myth when Bible stories are replaced by the scientific stories of astrophysics and the extrapolated evolutionary biology of lower organisms. Nor can social scientists' textbooks of discursive findings and tentative prescriptions quite capture many good ideas in a memorable few words in the way that these engaging stories can.

An additional advantage of fictions is that they are not as open to empirical challenges in arenas of commerce, family, nature conservation, or other worldly affairs. There is no point in niggling about the accuracy of details in a myth. Thus, it may be necessary for the guiding stories of any society to be manifestly fictional, yet readily subject to suspension of disbelief, and then to belief—on a not quite literal level.

**GREATER ADAPTIVE FLEXIBILITY IN USING CRITERIAL STRUCTURES THAN IN OPERATION-SEQUENCING.** Pulling back from these grand visions, we also remain dedicated reductionists. It is again necessary to take the microscope off the shelf. What is a *mechanism* by which stories and aesthetic affinities might influence behavior? Some human behaviors involve sequencing of movements automatized in highly practiced narrow skills. Because such programming of operational details uses up brain capacity at a rapid clip and has little flexibility, in higher organisms fixed action patterns have generally been reduced to brief units or

have softened while expanding into motivations (see Eibl-Eibesfeldt 1975, 1989). Other behaviors involve feedback from self-observation, compared with standards of intention. This gives range and intelligent flexibility to behavior without overcommitment to lists of details (see Campbell 1988 on epistemology; Griffin 1992; Lumsden and Wilson 1983; Milner 1970, 67, on "motor equivalence"). Selection processes are involved, although they have smaller ranges of variation than in natural selection; the information savings is somewhat analogous to the way the structures of the environment might be said to "contain all the information" for the organismic structures that emerge in evolution (Glassman 1977). Most behavior involves a degree of perceptually guided working to effect. An important remotivating element is satisfaction in successes.

A basic advantage that religious belief has over explicit listings of moral imperatives is in the informational efficiency of criterial patterns by contrast with operational specifications. It is helpful to draw an analogy with sensorimotor behavior, because more of its details are visible to an observer than with thinking or emotion. Once a person has selected a goal model with conscious intent, the rest is virtually automatic, and amazing. We can perform the same purposive action in many different ways. Some of the most strikingly beautiful examples of such "motor equivalence" (Milner 1970) are in the goal-oriented motor activity of the most skilled professional athletes. For example, Chicago Bulls basketball genius Michael Jordan has fluidly extemporized evasive maneuvers with creative new approaches to the goal that involve movement combinations never before made, now immortalized in video replay files. Although we do not yet know how to describe the neuro-cognitive criterial patterns underlying skilled sensorimotor behavior such as Jordan's, his heroic image provides a model of civilized social behavior for many thousands of boys and young men. Analogously, the biblical personae are models whose obedience and extemporizing can guide us and challenge us to think about moral issues.

*Pretend You Are . . .* A further analogy may be drawn between the criterial images of myths and the use of body English in sports. In a sport we may need to hold an odd posture in order to hone a motor skill. Indeed, in order to overcome typical errors of movement, coaches often advise neophyte athletes to pretend they are trying to do something quite different from their actual goal. Analogously, we may benefit from consciously suspending disbelief in myths, while observing ourselves. This suspension of disbelief evokes evaluations and emotions that make connections between the lessons of the myth and our own potential for perception and action.

Here is another good place to interrupt our zealous attempt to

understand the functions of religion in order to acknowledge analogous secular functions, in particular those in great literature. Secular stories can create new perspectives, inspire, and even infuse a sense of urgency capable of changing one's life. In some ways, the body of great literature cherished at institutions of higher education has served a quasi-religious function in our culture. Whether the present multicultural revolution is leading to a viable substitute, as samplings of authors of diverse ethnicities replace the older classics, remains to be seen (e.g., Bloom 1987).

Even in the old days of a couple of decades ago, the corpus of great Western literature was inherently much more diverse and open than the doctrines of any religion. Hence, while literature is richer and more engaging in its tracking of secular life, it may necessarily have less of an enduring unifying function than religion. Many people find numinously attractive the unifying conception of one God, of Christ, or of the Trinity. Related to this is the elegant opening of John, "In the beginning was the Word," and the unifying, context-setting flow of the first five of the Ten Commandments. The life-instructional second five Commandments seem to require more memorization. The authors of Exodus and Leviticus also followed up on the Ten Commandments with many, many more specific instructions. Although they were practical necessities for the combined religious-legal system of that time, many of these rules seem quite strange today.

The rapid cumulation of the corpus of secular laws in our democratic society similarly gives cause for concern. Ignorance of the law is no excuse, yet not everyone can become a lawyer. Too many laws are tantamount to no law. It is stirring to imagine a community that worked so well that its essence could be conveyed in a coherent set of stories, and in which the only prescriptively framed doctrine was the reminder to view your neighbor with respect.

In this section we have pursued the issue of human psychological capabilities and limits by discussing the idea that quasi-purposive living subsystems, or *modules*, might be pulled together to larger purposes by processes involving attractive qualities of criterial models. Yet the emphasis of the discussion has remained cognitive. How might such processes become more invested with emotion?

#### THE PSYCHOLOGY OF MOTIVATION: RADIATIONS FROM ABOVE

Scientists have an initial tendency, on confronting a new puzzle, to try to decompose complex phenomena into mosaics of subsystems bearing discretely localized functions; however, living systems often are fuzzy. *Motivations* are important examples displaying such fuzziness. Motivations are objectively defined as probabilities of particular classes of

behavior. Some motivations are easily related to specific deprivations (e.g., coldness, thirst), but in other cases questions of specific deprivation are not so simple (e.g., social contact, achievement).

What role can religion play in human motivation? The infusion of hope and courage into our lives is often cited as the positive motivational function of religion (e.g., Burhoe 1987, quoted above). While there is something uniquely valuable about religion in this regard, this property is also related to a radiating quality of motivations in general. For a more earthy analogy, consider the exploitation of sexual innuendo in advertisements; emotional spillover of this easily piqued and chronically undersatisfied agreeable drive is available to energize desire for all varieties of products and services. Sex sells. Alternatively, blockages of romantic fulfillment may sometimes sublimate into momentous noble deeds, as perhaps in Walter Raleigh's adoration and service for Queen Elizabeth (Bronowski and Mazlish 1960). But other motivations, too, radiate in this way: Such experiences as a smile from a friend or a word of encouragement from a respected acquaintance can charge divergent emotional systems.

Older behaviorist theories insistently viewed humans and other animals as having the entire structure of their motivations built upon relatively few primary drives, which have obvious biological evolutionary functions of survival or reproduction: eating, drinking water, pain avoidance, sex—and very little else. Thus, for example, the traditional behaviorist parsimoniously encapsulated the word *love* in quotes. Behavior that gave this appearance was explained in terms of secondary reward properties of stimulus objects (e.g., persons) that had been regularly associated with satisfaction of food hunger (e.g., "love" of one's mother) or sexual drive (e.g., "love" of one's wife). Behaviorists viewed religious behavior as also being merely contingent on a reward structure that had arisen in old accidents of environment, such behavior now tumbling willy-nilly down the generations as we both are molded by and perpetuate this reward system. There does remain substantial theoretical power in the behaviorists' mechanistic reductionism; however, newer studies within this and other psychology research traditions amply illustrate that drives and learned associations have only so much specificity, and that there can be considerable spillover among behavioral systems (e.g., Klein 1991, 272–85; Eibl-Eibesfeldt 1989, 65–66; Csikszentmihalyi 1990).

A hypothesized radiating quality of motivations is fundamental to Freud's view of the mind, for instance, in his concepts of displacement and sublimation. The ethologists' demonstrations of "vacuum activities" and displacements of thwarted drives to neighboring systems (e.g., Eibl-Eibesfeldt 1975, 1989) are reminiscent of Freudian theory. Versions

of these ideas also have been propagated widely in experimental social psychology, most recently acquiring cognitive coloration. For example, an unrelated source of arousal can heighten feelings of romantic affection, apparently as a result of generalized response facilitation as well as misattribution of the source (e.g., Allen et al. 1989).

Abraham Maslow's humanistic psychology descriptive system of motivation is a central part of American psychology, which can help us think further about motivational radiation. In its textbook form (e.g., Buck 1988) there are five levels in the Maslow hierarchy:

- Self-actualization
- Achievement and self-esteem
- Belongingness and love
- Safety and security
- Physiological hungers

Within the field of psychology, humanistic psychology is considered to be on the other side of the world from behaviorism, yet from outside of psychology they are not all that different in the way they try to reduce behavior to a few principles. Textbooks tend to overmechanize the Maslow hierarchy by emphasizing a simple ladderlike property. The lower levels, it is often said, must be satisfied before we can move up. This is held to be true both in individual development (babies are supposedly more concerned with eating, adults more with achievement) and at any given life stage (we satisfy a gnawing empty stomach before writing a paper). However, textbooks often do acknowledge variations; for example, a starving person may ignore hunger for the sake of some higher principle.

Maslow's scheme might be viewed as the distilled metaphysic of an individualistic, secular society: Note that the highest achievements have to do with some emergent of the individual self. From our present end-of-century perspective, Maslow's idea of self-actualization seems of a piece with Jung's quasi-theistic archetype of the Self (e.g., Jung 1964). Maslow's theory also seems kin to Teilhard de Chardin's emphasis on the individual within the historico-evolutionary significance of Christianity (Hefner, Peters, and Salmon 1995). What is going on here? Is the *theology* of higher meaning really a nice secular principle, burdened with a supernaturalist millstone? Or is the *psychology* of higher meaning a presumptive religion by another name? Parallels and differences are interestingly reflected in the life histories of Teilhard and Jung (Goetz 1991).

A thriving secular society provides all variety of sources of hope. The associated arousal may radiate downward from major goals of individuals and groups, or there may be a sharing of arousal among our little

personal or vicarious attainments. One bright spot in your life can make everything else look good. It is a bright day when your city's team wins the championship. As it happens, good times with economic and other secular successes also often distract us from religion. We easily forget how depressing it can be when there is a setback in a secular arena, how failures can radiate among our emotions, and how inner strength therefore needs a reliable source.

There is a potential trap in being guided by worldly ambitions alone. Maslow's theory and economic theory tell us that human ambition has the pervasive quality of ever-rising expectations. We also have a powerful tendency to measure success by comparisons with others. At the same time, we live in an age and place of vigilant mutual demands of tolerance and fairness. Recently this has involved a two-pronged context of (1) promiscuous definitions of interest groups and victim groups (Hughes 1993) and (2) a homogenized materialistic framework for judging the good life. This brings us up against the wall of a democracy that may now be too myopically conceived. Everyone is expected to rise above everyone else. Exaggerating a bit, here is an example of a common line of thought: "A couple can have children, yet this should not at all impair the free choices and economic self-fulfillment of either partner. Too bad there isn't more day care available. Someone should do something about that. (They should tax the rich more.) And isn't it a shame that the immigrant day-care worker doesn't earn almost as much as the little that I do?"

The present-day brand of secular self-fulfillment may depend too heavily on self-deception about the structure and legitimate costs of democratic values. Diversity of interests is a prerequisite for economies of scale and other synergies of a complex society, which yields more for individuals than if they went it alone. Although fairness must be judged, it cannot be measured with a caliper, and it is debilitating to try to do so.

Ideally, human groups achieve synergies in complex enterprises as members cooperate. Fair resolutions of conflicts are rarely completely self-evident, because the trade-offs are always apples and oranges. We are almost always reciprocating with dissimilar goods and services, often indirectly via other people. Habituation to satisfactions and fundamentally boundless aspirations are intrinsically human sources of conflict, which have led organizations to falter and perhaps even civilizations to fall. A high degree of intelligence or knowledge of psychology often merely adds intricacy to the conflicts rather than reliably protecting against them.

How, then, is a community to avoid petty invidiousness, especially when a standard of comparison, such as money and the known cost of possessions, is so convenient, and when media programming increases

both our materialism and our competitiveness by focusing us all on common fashions? Perhaps radiation from above of a communal motivation is crucial to cultural longevity. For a society to persist, wishes of individuals for a life together may have to far surpass the bookkeeping of individualistic opportunities. Monotheism provides a way in which such influence can come down from an abstracted complex of ideas. Under primarily secular conditions monotheism may safely unify precisely because it avoids coupling to real goods and competitions. At its best, the atmosphere it creates may amplify itself by leading people to find inspiration in each other's inspirations.

The biblical history of Israel is a testament to the delicacy of making this work. From a democratic society under God, the Israelites swung to desiring leadership under a monarchy, yet the prophets remained an important connection with higher principle, generally respected by the monarchs. In secular terms, how does such a higher principle become autonomous? God's reality may be hypothesized to be an overdetermined coherent pattern of many social phenomena, not critically dependent on any particular few elements. To illustrate in one way, if the Bible were one single parchment book, in one single hallowed place, we would have an artifactual focus of contention. But information is virtually free of the physical law of conservation of matter. Although requiring adjustment and renewal, information has greater potential for immortality than does any material object. The motivational characteristics of the hypothesized, robust God construct can always radiate outward to boost and patch our enterprises and our eagerness for the next enterprise—even when, inevitably, individuals flag or particular reciprocal deals fall through.

#### COGNITIVE THEISM AND BIO CULTURAL COEVOLUTION

MONOTHEISM, POLYTHEISM, FREEDOM, AND DIVERSITY. The preferred form of theism needs to be considered further. In a society dominated by religion, perhaps polytheism grants individuals some of the freedom that Western civilization has found in secularism. But a drawback may be a risky volatility in shifting competitions and cooperations projected onto the personae of the gods. Also, having a god of this and a god of that may bring metaphors of the supernatural too close to specific practical daily affairs, thus introducing excessive, unrealistic otherworldliness and justifying the word *superstition*. In contrast, a society dominated by secularism may more safely draw unity from a monotheism that has the abstracted characteristics of the Judeo-Christian tradition, with little fear of monolithic theocratic tyranny and little fear that supernaturalist ideas will fog up daily affairs. With monotheism as a

supplemental source of unity, the secular society may achieve a greater and safer freedom with its major social functions in a small number of main systems, for example, political, economic, academic—and religious. The global, overlapping nature of each of these systems adds overall social stability while leaving opportunity for individuals to redistribute their major and minor commitments as they wish, according to their self-discovered aptitudes and tastes. The mythical character of monotheism under secular conditions tends to remove it from conflicts in practical affairs; it may nevertheless function as a simulation arena for generating hints about how to handle real-world problems as our community interprets and reinterprets its many religious stories.

The traditional American forms of religious diversity in approaches to one God and to Jesus Christ seem culturally safer than idol worship. Dominant, multiplex Protestantism spawns denominations, and perhaps this implicit encouragement of creative choosing fans secularism. At the same time, the greater tendency toward monolithic orthodoxy of Catholicism, and perhaps of Judaism, is mitigated by the minority status of these religions.

In America today, the ethic of diversity marks an attempt to accommodate interpenetrating long fingers reaching from many cultures whose larger bodies are elsewhere in the world. There are new questions about the degrees to which different traditions encourage particular social behaviors, such as diligence, peacemaking, aggressiveness, birth-rate, and learning, and about whether these diverse emphases can mesh well with each other. However, the evolutionary significance of diversity is not merely in its accommodation of variously labeled human groups but also in the myriad information patterns hosted by those groups and by the human individuals that compose them. Mixing of cultures is conducive to change, but how might it be possible to indefinitely and peacefully prolong these liminal creative conditions? A partial answer may be in Ralph Burhoe's novel use of the concept of symbiosis.

**BURHOE'S EXTENSION OF THE CONCEPT OF SYMBIOSIS.** In human beings, there is a unique augmentation of biological evolution by cultural evolution, but this is not in the typically surmised sense of a polite and refined, purely cultural superstructure holding the reins of its underlying, impatiently snorting, rather animalistic biological foundation. Rather, each of these two main components of evolution feeds back to, and builds upon, the other. Each includes its own characteristics contributing both to peacemaking and aggression. Each has subtleties. Human traits that bridge the biological and cultural components include motivations, aptitudes, reflexes, perceptual sensitivities to particular patterns, and foresight.

Labeling such phenomena "culturgens," Lumsden and Wilson (1983) identify a few particularly revealing examples, such as the incest taboo, our inclination to learn a visceral fear of snakes and spiders (evolutionarily old dangers) much more readily than a fear of electric sockets, guns, or nuclear waste (evolutionarily new and greater dangers), and categorical perception of colors. In a variation of a well-known evolutionary argument, Lumsden and Wilson attribute the unusually rapid evolution of the human species (a few million years), including our species' distinguishing feature of a plan-making frontal cortex, to "the enchanted circle" of gene-culture coevolution. The mechanism is this: Our human genes are the seeds of our human brains. Our brains provide capacities and inclinations toward the learned adaptive behaviors that comprise culture. The most successful individuals and cultures powerfully recreate the environment, and then, within that recreated environment, a new round of natural selection takes place.

Thus language, social perceptiveness, and other human mental abilities also are said to have arisen. A great deal is now known about specific forms taken by meshings of nature and nurture, as implied by the theory of natural selection (e.g., Lorenz 1969; Hardin 1982; Glassman and Wimsatt 1984; Diamond 1992) and as illustrated in a broad spectrum of empirical evidence (e.g., Eibl-Eibesfeldt 1975, 1989; Kagan and Snidman 1991; Plomin, DeFries, and McClearn 1990). Among the most clearly reasoned of a recent spate of scholarly-popular books (albeit not extrapolating far enough beyond selfish-gene reductionism) is Wright's *The Moral Animal* (1994). The scholarly anthology edited by Barkow, Cosmides, and Tooby (1992) signals well the coming of an evolutionary psychology, lavishly supported by empirical findings and incisive logic.

Notwithstanding all of this, the coupling between nature and nurture in human evolution remains difficult to grasp conceptually. Perhaps this, as much as stubborn ideology, is the reason for the persistence of vacuous backlashes of pure environmentalism. A concept and a word are needed by which we can felicitously summarize the essence of what is special about human evolution.

Ralph Wendell Burhoe (1981; Breed 1992) has made the important suggestion that we extend the concept of *symbiosis*. In its orthodox meaning, a symbiosis is a synergistic relationship of complementary phenotypes based strictly on the genetic information in two different biological species. Both partners benefit. Typical examples are the grouper with its cleaner fish, ants with their aphids, and humans with their intestinal *E. coli* bacteria necessary to digestion. Burhoe stretches the term *symbiosis* to additionally refer to the intimate multifaceted relationship between the human genetic information system and the human

cultural information system. Taking a bit of license, I might add that he has thus attempted a new way to describe human "special cocreation."

*The Human Difference.* The fundamental fact that animals with backbones need two parents has at least the following two great significances for life: (1) It makes possible the mixing of chromosomes in vast pools. Such constrained mixing of genes is fundamental to the biological evolution and maintenance of complexity in higher organisms (Symons 1979; Maynard Smith 1978; Williams 1975), including self-repair and genome reliability (Culotta and Koshland 1994; Francis, Lee, and Regan 1981). (2) Sexual reproduction implies at least a certain limited sociality based on altruism graded according to degree of kinship (Dawkins 1989). In both of these ways, humans are like all other chordates. However, humans and only humans, among higher organisms, have also achieved an *ultrasociality* (Burhoe 1979; Campbell 1991; Lumsden and Wilson 1983) that far transcends lines of genetic kinship, in vast networks of often-cooperating individuals. Among all the remarkable *cultural* phenomena of human beings, the one that most importantly enables this ultrasociality is *religion*, Burhoe argues. It is a critical ingredient in the symbiotic glue.

The suggestion that religion plays a crucial positive role in human secular affairs may seem incongruous to a secularist, but it is, after all, not startling. It is virtually a cliché in popular archaeology that the origin of truly human culture is marked by burial artifacts, suggesting self-conscious belief in an afterlife. Thus, paradoxically, we readily accept that creatively unrealistic beliefs may be a prehistoric correlate of the intelligent realism needed to successfully make artifacts. Similarly, Jaynes (1976), in his grand speculative tome, linked religion with human consciousness, hemispheric lateralization in the frontal cortex, the origins of language, and what according to him is the quintessential human ability—to sustain an intention over time intervals much longer than minutes or hours.

It is true that societies also are organized by economic and political systems, by shared literature, music, art, and history (and by facile reflections of all these things in popular culture), but Burhoe argues that without a religion these phenomena do not have the necessary reach or strength to unify groups. In Burhoe's adaptation of the term, *symbiosis* needs no quotation marks around it when used in discussing the association between human genes and culture. This is because human creations and vectors of culture—including artifacts, written, pictorial, and audio recordings of knowledge, and the opportunities we systematically make available to each other—are so organized and influential as to have a partial claim to the ontological status of organisms.

Like organisms, the information in cultural phenomena dissociates

and recombines, sometimes in curious ways, as it migrates across the varied terrains of disparate societies and passes down the generations. In a delightful tiny example of this, novelist Milan Kundera asks: "Who is Agnes? . . . Agnes sprang from the gesture of that sixty-year-old woman at the pool who waved at the lifeguard. . . . If our planet has seen some eighty billion people, it is difficult to suppose that every individual has had his or her own repertory of gestures. . . . [N]o individual is capable of creating a fully original gesture. . . . On the contrary, it is gestures that use us as their instruments, as their bearers and incarnations" (1992, 7). A larger example of the living nature of cultural institutions was offered by playwright George Bernard Shaw in his ironic discourse on human evolution, the play *Don Juan in Hell*. Struck by the persistence of the institution of marriage in the face of so much marital strife, he personified marriage as lascivious for the way in which it propagates by playing in exquisitely devious complementary ways upon the differing emotions of the women and men whom it exploits (Shaw 1901).

While we biological humans remain necessary as *hosts* of organizations of cultural information, like parasitic or symbiotic organisms, these packages that we host have lives of their own, reproducing readily from the substrates of some human groups to others. Importantly, such cultural reproduction is often independent of genetic distinctions of ethnicity, race, or gender. A new cultural organization often thrives upon an ethnic substrate that it has never before touched, as Toynbee (1972) emphasized in parts of his theory of history. Sometimes this is because culture taps aptitudes common to all people. At other times the reason must be that all groups have individuals of many different personalities from among whom the cultural patterns of information have ample opportunity to select carriers.

We should progress from the endless and unresolvable nature-nurture debate to a full science devoted to the study of gene-culture symbioses. Again, it is crucial to keep in mind that the extended symbiosis idea does not merely associate genes and culture, respectively, in lockstep parallel with the forces of lower versus higher, primitiveness versus civilization, id versus superego, and so forth. Symbioses are not that simple. Gilkey (1995) expresses a similar concern.

**BIOCULTURAL SYMBIONT POOLS.** Technology has brought widespread commonalities to the structures of environments, so that as we enter the third millennium of the Common Era, preservation of diversity in culture, no less than in the biosphere, must be an act of human will. Such preservation would be not just for fashionable political or aesthetic reasons but also for the conservative value of better ensuring future human adaptiveness. This effort will require facing difficult

political questions squarely, such as whether it is possible to run a nation in which, over generations, different subgroups insistently speak different primary languages without assimilating. Short of such extremes we need somehow to work out how to tolerate each other's areas of exclusiveness and how to see that competitiveness remains enlivening, while maintaining degrees of vigorous mixing, creative interaction, and friendships. Hardin's (1982) comments are extremely perceptive and largely, but not completely, correct. A community (and within it, subcommunities) must have boundaries whose permeability has limits. Altruisms must be discriminating. However, the United States is likely to remain a liminal region in which cultures press and stimulate each other. We will likely continue to need a degree of inflow of immigrants who labor in ways that others of us feel above and who have children who become thriving business leaders and teachers, who contribute great science once given the opportunities here, and who enrich us in other ways. Thus, this is a place where a good attitude about all of this is extremely important.<sup>5</sup>

As individuals with two parents, we each wind up with much more genetic and cultural information than we actually use, but at the same time much less information than we need. Hence, a truism: People need each other. Some genetic and cultural information requires common-interest groupings of individuals in order to spring usefully to life. In a good society coherences evolve among these groups. Many bits of social organization may be museum pieces, as we each donate some of ourselves to old things that we like to do, but among these old-fashioned motifs are some that will again become engaged in something larger in the future. A rough analogy is found in the biological evolution of phyla, when surges of progress to more advanced species arise from a branch someplace far down on the trunk of evolution's metaphorical tree, from some of the more primitive species existing at the time. Part of the additional marvel of human ultrasociality is that branches distant from each other may find new ways to hybridize fertiley in the cultural portions of their information streams.

**MYRIAD SYMBIOSES.** Genes and cultures comprise the two major streams within which human information is borne, with human individuals occupying a special place as the momentary repositories and vectors for myriad, diverse information patterns in both streams, a tiny bit of it (more specifically,  $7 \pm 2$  chunks of it) swirling in consciousness during each of our waking moments. Each individual is a temporary host for would-be coherent conjunctions of information. Each of us is a unique natural experiment comprising a live packet of many personal versions of gene-culture symbioses.

In any given generation, evolution's microstructure involves a self-sorting and other-sorting of human individuals (Glassman 1984), based on our mutual perceptions of what nature and nurture have wrought in each other's world lines. In the longer run, natural selection indirectly, ponderously, yet with precision, judges and often changes the distributions of emotions and thoughts in human minds. It does this by means of the selective survivals or demises of the social structures and artifacts that we create. The meanings that we make are implicitly *predictions*. They are subject to a much larger inexorable natural process that may prove them correct or incorrect.

Human organizations and societies comprise a seething ecology. What causes given human individuals to lend themselves more to a genetic or to a cultural information source at any given time? We emphasize genes when behaving in a "selfish-genish" way (Buss 1991; Dawkins 1989); this may involve sexual promiscuity, prolific childbearing, parents of either gender vigorously supporting their own children (Browning 1994; Glassman 1992), or other actions focused ultimately on the advantages of one's own genetic distinguishing characteristics. We favor culture, to an extreme, if we devote our personal resources to teaching all those who come our way or devote ourselves in other ways to institutions that propagate culture (e.g., Glassman 1980; Glassman, Packel, and Brown 1986) to a degree that sexual reproduction is at an ebb. A simple inclusive fitness analysis might suggest that this kind of altruism is feckless; such extremely culturist cultural flames might be extinguished within a generation. However, the turbidity of the biocultural symbiont pool often leads good cultural information to multiply sufficiently rapidly, to overcome the genetic infecundity of many of the most vigorous culture vectors, by alighting on a new family, and then on others.

*All human behaviors* occur within the ecology of gene-culture symbioses, so many of the most important of life's patterns are not in the extremes of being a gene propagator or a culture propagator but in the details and rationales and real causes of our myriad behaviors. We should think about all these human behaviors while puzzling over the logic of inclusive fitness. That logic cannot be escaped, but it may be extended, perhaps along the lines suggested here, to a better understanding of the nature of civilization. Experimenting with cognitive theism is a way to become immersed in such an effort.

#### SUMMARY AND CONCLUSION

This article is a modern variant of an old genre, the rational argument for the existence of God. Taking psychology and evolutionary theory as the primary scientific sources, I assert that remediation of present

social fragmentation and the long-term vigor of our secular society require those of us who routinely take an intellectual, rational approach to all things to find a way to recapture more of the spiritual or psychological value of traditional religion, and particularly of Judeo-Christian *theism*.

According to Ralph Wendell Burhoe's naturalistic theory, religion is the cultural phenomenon that most helps civilized humans to transcend the local, selfish survival contingencies of biological evolution. But today religion is in decline, while our secular culture faces centrifugal challenges in its diversity and its rapidly expanding information load. We do not wish to regress to a burden of old religious superstitions, but perhaps there is some way to rejuvenate our ability to derive benefit from the accumulated wisdoms of our progenitor religious civilization. Among these wisdoms, of course, are the Ten Commandments. Yet for a modern social pragmatist the dominant theistic emphasis and unconcern with human social interactions in the first four of the Ten Commandments is a profound enigma. I suggest a functionalistic explanation here and then extend it as a hypothesis about the social function of Jesus' daring distillation of the ten to *two* commandments, to love God and neighbor.

Secular intellectuals themselves might find value in taking our Western theistic traditions on their own terms; but how can we do this while maintaining our self-respect as rational thinkers? *Cognitive theism* is proposed as an intellectual's plan to periodically *suspend disbelief* about God and the biblical stories. I offer support from several areas of psychology:

1. *Memory*. Experimental psychologists' studies of memory have revealed both capacities and severe limits of which laypersons ordinarily are unaware. This suggests a possible benefit in the proposed cognitive theism exercises, as a way of "expanding the mind" safely within well-winnowed traditions. Issues of cultural diversity might be incorporated to a limited degree in such exercises.

2. *Perception*. Sophisticated realists understand that there is always an aspect of indirectness in the visual perception of objects. Yet we have a remarkable gift for perceptually pulling certain disparate arrays of sensory inputs together into robust wholes. I propose that we secular intellectuals tentatively grant the possibility that some theists (perhaps some theologians among them) are genuinely perceptive in an analogous but broader way. Rather than merely purveying dogmas or hallucinating, they may actually be pulling together a variety of evidence from observations of society and nature—as well as from tradition—to a perception of God. I draw an additional analogy between two kinds of mismatch: (a) There are a variety of pathological mismatches of information acquisition in vision that lead gestalt perception to fail (e.g.,

causes of double vision or motion sickness); and (b) today's electronically boosted ultrafast cultural evolution is not well attuned to the slow pace of biological natural selection. Neuropsychological remediation of this latter mismatch may be achieved by some culturally informed perceptual bridging mechanism—such as cognitive theism—which operates on a timescale intermediate between those of genetic evolution and changes in popular culture.

3. *Personality.* There is an analogy between the unifying characteristics that theists attribute to God and the behavioral unifying properties of the *I*, or human agency. Both in describing the array of life in nature and in describing the neuropsychological functioning of individuals, it is appropriate to talk about *distributed systems* and *modularity*. Both among and within organisms there are ubiquitously a variety of feedback processes and other fragments of intentional behavior. These often self-organize into larger systems. Criterial elements and selection processes play a prominent role when such self-organization takes place within human minds. Our aesthetic sensibilities are among the criterial elements that bring things together. With this in mind—and while vigilantly avoiding a slide into foggy supernaturalism in our science teaching—we might even go so far as to incorporate into our cognitive theism a *cognitive neocreationism*. Such a deliberate suspension of disbelief about the beautiful Genesis 1 and 2 stories might help us better to appreciate their implicit ethical principles.

4. *Motivation.* The tendency of motivations and emotions to spill over, or radiate, suggests that a good theism might help to sustain a society by absorbing sufficient passion to smooth over our individualistic striving. Such an additional source of purpose might help turn our society into less of a bazaar and more of a synergy. In predominantly secular society, monotheism has a valuable advisory unifying function. Our assumption that biblical stories are not literally true tends to insulate them from our lives' contentions and from shortsighted empirical tests, therefore preserving their value as sources of ethical truth.

In his scientific theology, Ralph Burhoe has importantly extended the concept of *symbiosis* to the unique meshing, in humankind, of genetically and culturally informed phenomena. This unusual form of symbiosis defines our species. Special challenges and opportunities have recently arisen in the West, with its increasingly interpenetrating diverse cultures and varieties of individuality. I suggest that a scientific program is needed which develops a view of all of humanity as a substrate of *biocultural symbiont pools*. Such a program may enable us to go somewhat beyond the biocultural evolutionary restricting law, which holds that altruisms must have boundaries, that they must be sufficiently discriminating to reliably support their own genetic substrates

during natural selection. Individuals have many similarities and differences, in both nature and nurture. A generalized attitude of mutual support is the fertile social condition in which packages of knowledge and forms of social organization might pass and evolve across secure human biological substrates. With human beings the possibility first emerges that natural selection may deemphasize the competition for survival and reproduction among selfish assemblies of protoplasm with relatively impermeable boundaries. This material life-and-death form of evolution may be supplanted by a more informational kind in which new forms of organization are naturally selected primarily by means of continuing, friendly self-sorting recombinations of human groups, accompanied by mutual teaching, new self-discoveries, and continuing development of culture.

In older aristocratic societies, unification and trans-kin giving were often coerced from the top by a political or economic hierarchy. In democratic societies, individuals thrive with more distributed sharing, but such societies may be vulnerable in the long run to factionalistic fragmentation. Theism introduces an abstracted form of unifying hierarchy, but it, too, has been known to deteriorate into self-serving hierarchicalism because of the actions of individual persons in power. Perhaps cognitive theism can help us to capture both the unifying qualities and the distributed sharing of the religious, political, and intellectual systems from which it is derived and can thereby help to set and maintain appropriate spiritual/psychological conditions for long-term continuity of a good civilization.

## NOTES

This article owes a great deal to a series of seminars and conversations of the Chicago Group, based at the Chicago Center for Religion and Science, during 1988-91, most constantly involving participation of Carol Albright, Ralph Burhoe, Richard Busse, Thomas Gilbert, Philip Hefner, Rodney Holmes, William Mecham, James Nelson, Bernard Richard, and Roy Ringo. I thank Lake Forest College colleagues Roger Faber, Forest Hansen, Mary Knight, and Charles Miller for reading earlier partial drafts of this paper and giving cogent comments. Much of what I know of the Hebrew Bible is the result of over a decade of fairly regular attendance at a weekly Lake Forest College Torah Study Group organized by Ronald Miller. I thank Jill Glassman for the Kundera reference.

1. Here is one point at which this programmatic paper begins to approach predictable hypotheses. It might be interesting to try to design PET-scan studies of people during prayer, deep ethical thought, or action motivated by prayer. More challenging than the great technical problems in state-of-the-art measurements of the brain activity of moving subjects are the problems of meaningful design. We confront somewhat dissonant paradigms here. A shortcoming of experimental psychology is its tendency to subordinate theory by prematurely narrowing and operationalizing definitions. Such parsimonious technocratic narrowing often fails to epitomize. It merely comforts experimentalists by concealing ambiguities rather than resolving them and often leads incorrectly to global debunking of a basically good idea. While new empirical contributions to the ideas discussed here are desirable, a great deal more review of the psychology, neuroscience, and theology literatures and more careful hypothesis development will be necessary before suggesting any critical neurophysiological tests. It seems unlikely that the essence of spirituality will turn out to be neurally localizable in any radical sense, just as it

is fallacious to claim that "language is in Broca's area" or that optimism is simply in the brain's serotonin synapses, and so on.

2. It is additionally interesting to note that the Old Testament moves from commandments about belief in God, in commandments 1-4, to commandments about the community in commandments 6-10, via commandment 5, to honor one's parents. Commandment 5 may also be seen as setting an attentional context. In terms of sociobiology this important transition places a degree of emphasis on kin selection. In attempting to create a larger community that transcends family and crosses ethnic lines, Jesus' reduction and transition moves the emotional/moral sense of the first table, now summarized in his single first commandment, over to his second. This certainly subsumes the second main sociobiological sense of altruism, i.e., so-called reciprocal altruism among nonkin (see, e.g., Burhoe 1979), but I believe that in its form, Jesus' second commandment can also be taken as a conjecture about a possible larger hoped-for biocultural-evolutionary strategy. Perhaps we can figure out how to describe it in the more rigorous language of evolutionary biology or evolutionary psychology.

3. For a long time, many experimental psychologists and behavioral neuroscientists have made a serious mistake in turning away from some of the most interesting problems of psychology. Their traditional tendency to shun problems concerning conscious experience, in fear of being ridiculed as nonscientific subjectivists has left a vacuum into which some naive physicists have marched with pompous talk about noetic characteristics of elementary particles.

4. Also Szendre and Rychlak 1995. A paper by Moskowitz, Suh, and Desaulniers (1994) is a good example of a recent empirical study that develops the concepts of *agency* and *communion*. Both concepts represent human action characterized by intentionality, with the former involving more individualistic personal control and the latter more collaborative decision making. There is less of a tendency today than a few years ago to associate these hypothetical modes with prototypical masculinity and femininity, respectively.

5. The need for a good attitude is indicated also in the recent large number of scholarly books about the importance of *trust* for the long-term health of a society (see reviews by Forman [1995]; Brooks [1995]). Emphasizing a cultural quality such as trust does not mean that natural selection has been superseded but that we must be alert to special complexities of its operation in the human species. Both of the cited reviews are driven to some degree by the recent dismay on the part of World War II veterans' groups at the character of a previously planned Smithsonian Institution exhibit on the use of the atomic bomb on Hiroshima and Nagasaki fifty years ago. I lean toward the views of the veterans and of others who believe that extremes of self-flagellating revisionist history in education are dangerous to the integrity of our society. (In recent talk shows on public radio, members of the crews of the airplanes that dropped the bombs have reminded us of the political and military realities of 1945, including the expectation that hundreds of thousands of American troops would have been killed or disabled in an amphibious invasion. These old soldiers reject assertions that they are now racked with guilt, at the same time convincingly expressing compassion for the hundreds of thousands of Japanese who were killed or disabled. Their expression of sympathy, although pertaining to civilians as well as to soldiers, seems somewhat reminiscent of the prayerful expression of compassion for Pharaoh's troops in the Red Sea, in the Passover service.

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