

Endmatter: *Remembering Ralph Wendell Burhoe*

SYMBIOSES CAN TRANSCEND PARTICULARISMS:
A MEMOIR OF FRIENDSHIP WITH
RALPH WENDELL BURHOE

by Robert B. Glassman

Abstract. Ralph Burhoe's paradigmatic scientific innovation is the extension of the concept of *symbiosis* to coadapted human genotypes and "culturetypes," centered on religion. Civilization also requires a coexistent secular arena, where religion's nearness may help prevent our natural synergistic instrumentalizations of each other from degrading to losses of respect for one another as responsible free agents. The mixed messages in the Bible's diverse stories help to preserve a richness of choices in memory as we navigate history. We science-and-religion theorists should expand our academic base to include economics, politics, literature, and other areas, while emulating Ralph's wise and good-humored ways of drawing us together and affecting our lives.

Keywords: agency; altruism; Ralph Wendell Burhoe; Christian theology; civilization; coadaptation; culturetype; economics; freedom; genotype; God of history; hostility; instrumentalize; Jewish theology; nature/nurture; neuroscience; psychology; reductionism; secularism; selfishness; symbiosis; synergy; values.

"GENOCULTURAL SYMBIOSIS": A SYNTHESIS OF THREE INTELLECTUAL TRADITIONS

At the center of Ralph Burhoe's philosophy is the idea that human culture is in symbiosis with the human genome, and that religions play a crucial role in that symbiosis. The term *symbiosis*, in its orthodox biological

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meaning, describes a special adaptation between two species, in which each fills a vital need of the other. This crucial reliance on *an other* entitles such a purely biological relationship to serve as an excellent metaphor for the most basic ingredient of human social interrelatedness, whether we look upon such interrelatedness as occurring between individuals, groups, or institutions, or between aspects of our genome and of our culture.

In its prototypical biological form a symbiosis is already automatized. It does not have the shimmering, dawning, pregnancy-inducing quality of the best human intellectual and emotional couplings. The Burhoe extension of the concept of symbiosis does have that numinous quality. Burhoe's view implies that the relatedness among human individuals at its best nourishes those individuals at the same time as it enables them to transcend themselves and to become part of a flow pattern, from past to future, of yoked genetic and cultural information. Burhoean symbiosis is a paradigmatic and potentially world-renewing concept. Ralph's theoretical perspective combines three intellectual traditions that matured during the twentieth century:

(1) The computer revolution's reification of *information* as something so real it might be measured and transmitted. Information can be duplicated at little cost in energy or matter, or it can be altered in highly controlled programmatic ways.

(2) The neo-Darwinian concept of *genotypes*. Although genotypic patterns are bound inexorably to the singular substrate of DNA, the slow communication and reshaping of their organized complexity by the curious inner logic of meiosis and sexual recombination—constraining and preserving but not bottom-up comprehensively determining—and their creative reshaping by the extrinsic logic of natural selection qualify them as varieties of transmissible and mutable information.

(3) The renewed appreciation of *knowledge* and of *wisdom* as classes of phenomena somewhat beyond "information." Knowledge and wisdom are also transmissible and mutable; they have an organic and holistic (or "emergent") character but may or may not ever turn out to be as quantifiable and linearly codable as electronically telecommunicated "information" or genes on a chromosome. Such human cultural patterns almost display lives of their own by their free communicability on substrates of human brains and human artifacts, yet they are also *physical* phenomena (see, for example, Burhoe 1972). Thus, the term *culturetype* is a handy coinage, even if the relevant phenomena cannot (yet? ever?) be readily analyzed into discrete units. Indeed, at times, DNA genes or digital logic bits and bytes lend themselves to quantification most readily at a scale more fine grained than the scale of meaningful patterns of genetical and digital information.

The Nature/Nurture Wars. Today, as before, much lip service is paid to the need for an integrated understanding of nature and nurture, with such hopeful jawboning now supported by new data in academic subfields whose neologistic names suggest attempts to shed the taint that had been brushed onto "sociobiology." In addition to the older fields of behavior genetics and population biology (which continue to accumulate findings but often focus upon issues a safe distance from the most tendentious human matters), integration is also attempted by behavioral ecology (for example, Smith 1991; Houde 1997). But it is the new field of evolutionary psychology (Barkow, Tooby, and Cosmides 1992; Dugatkin 1998; Wright 1994) that has waded right into the thicket of controversy. Some areas of neuroscience are there with it (Deacon 1997; Pinker 1994).

These major efforts will not be sufficient for us to move ahead. To break away from the Sisyphean ideological polemics of the nature/nurture wars in academia something more paradigmatic is needed. We require an integrative concept with "oughtlike" implications that maintain a hopeful, humane bearing, while carrying the mass of old and new information about human instinct and learning. Such a concept must be constraining while having adequate flexibility to encourage critical theorizing and reshaping. These requirements are met splendidly by the Burhoe extension of "symbiosis"; this extension should be developed systematically as a scientific theory. Here, I try to suggest aspects of a program for doing so.

GENOCULTURAL SYMBIOSIS WITHOUT RELIGION

Sometimes genocultural symbioses in the world, overall, confer human progress and wholeness. Ironically, however, without an adequate understanding of the biocultural symbiotic function of religion, toward which Ralph has pointed us, his wise perception of intertwining flows of genetic and cultural information becomes an insight that helps to explain much of human destructiveness. Secular social phenomena, by a near approach but failure to achieve the wholeness that Ralph hoped to nurture, may become the demonic opposites: ruthless political and economic competitiveness, a tendency toward in-groups and out-groups, exploitations of others, the twentieth-century mastery of methods of wholesale murder (Burhoe 1979; Diamond 1992), the possibility of an end to humanity. To be sure, insistent secularists aim the same criticisms at religions, sometimes validly.

Parallel Human Attitudes. It may be that neither secular nor religious attitudes are "more fundamental." Perhaps each is equally a deep part of civilized human nature. Each is potentially unifying or divisive in roughly equal measure. Secularism and religion exist *in parallel*, merged in

many ways and distinct in others. We live two parallel lives as a civilization. Many of us live both lives as individuals, perhaps rationalistically integrated, perhaps not. In any given era or geographical place, one of these lives is less dominant, and from that position it may help to motivate and suggest while also acting as a critical check on the emergence of inhumane abuses in the other. In both religious and secular organizations these abuses can take forms such as frozen hierarchies or other excessive localizations of power, rampant hypocrisies in the political process, and selfishness of varied sorts. Prototypically, secularism emphasizes human instrumentalism and expansiveness from foci, while religion emphasizes reverence and linkage; however, in actual practice, both religion and secularism include the presence of both these attitudes, variously waxing and waning through history. Thus, for example, the presence of egoistic expansiveness from foci within religion is a theme of Reinhold Niebuhr's work (Rasmussen 1991).

Today, in the United States, secular folks who have become exasperated with our divisiveness, litigiousness, and general carping at each other may glance back toward neglected religion, with new murmurings of nostalgia and hope. But let us also remain aware, as we return to try to mine and refine the old wisdoms condensed in religions' mythological codes, that in the far and recent pasts, *secularisms* have sometimes turned the tables and provided the saving grace for populations enmeshed in stultified religious forms. The process can work either way. Either "Enlightenment" or "Awakening" can be enlivening.

Social Selection. Social evolution of genocultural symbioses involves a great deal of self-selection into sought opportunities. There is also "other selection," or mutual social selective processes. Lucid systematic study of such effects has emerged at the leading edges of the fields of behavior genetics and of developmental psychology. Here is a handy term from those fields: People seem to engage in deliberate "*niche-picking*." A strange result is an apparent causal relation from genes to environment. That is, individual differences in the environments people inhabit seem to be influenced by individual differences in their respective genomes. Although actually based on selection factors, this effect looks causal from a distance, as if messenger RNA can reach right past the skin to influence the world around us. These matters are reviewed briefly and well in an excellent current textbook of developmental psychology (Berk 1997).

Although secularism often works well, human wholeness probably prefers an overarching, rather theistic ideology. Yet there is so much pious smugness and walling-off blindness among religionists. Even after many years of Burhoe's teaching and of wonderful associations at the Chicago Center for Religion and Science (CCRS) and its relatives, a part of me continues to flinch when I think of religion, even more than

I chafe at the grand oratorical self-indulgences of secular academicians. Might there be a chance—albeit risky—of finding a unifying secular ideology that is merely *like* religion? Can we keep our human lucidity fully engaged while entering into something much larger than our individual selves?

Read on, and be prepared to hope and to seriously doubt: Might it be possible to come up with an encompassingly purposive secular “strategic plan for humanity”? Can that conceivably be done honestly, without hubris and without the hard, brittle edge that revolutionary political ideologies tend to acquire? Or would such a grand effort merely be communism or national socialism, and so on all over again? Ideological structures and processes, while achieving piecemeal centripetalness, easily become globally centrifugal. They often lead to provincial coalescings of diverse groups whose labels dry and harden and whose respective sets of purposes come into conflict with each other much of the time. This occurs on a larger scale than do conflicts between individuals, perhaps for essentially similar reasons. Relationships based on explicit rationalistic bargaining for goods may be inherently unstable. Tit-for-tat easily becomes a less-than-zero-sum game.

To better understand how this occurs and perhaps how it can be overcome, we will need to carefully bring on board a greater array of intellectual traditions in social sciences and humanities than Ralph himself had time to fully develop. How should we of CCRS and the other formal and informal associations Ralph founded seek additional good friends to help? Perhaps by trying to model ourselves after Ralph, as he became a good friend of so many of us, one at a time, individually.

DANGEROUSLY SELFISH GENOCULTURAL SYMBIOSES

In wars of aggression, ancient peoples slew each other by the thousands, often following betrayals of trust. Winning soldiers obeyed a naturally selected, evolutionarily stable record of strategy in prior human history shouted up at them from their gonads: “Kill or enslave the men; enslave the children; have your way with the women (quickly, before your buddy in battle).” But in the twentieth century, such murders by the thousands—in recent years, for example, in the former Yugoslavia and in Rwanda—represent the modest end of the continuum. This is exceeded by the systematic slaughter of millions (Armenians, Jews, Cambodians), and by killing tens of millions of people the Stalinists of the former Soviet Union apparently hold the current world’s record in wholesale death-dealing. That record may soon be broken if germ technologies bear infectious fruition. How is it that human progress has such a long red shadow?

We humans have quite a taste for vigorous hostility. Today, constrained by embarrassment from expressing xenophobia in the present climate of "political correctness," the public has found ways to exercise this archetype with two recently popular film fantasies. *Independence Day* solved the problem by portraying Earth humans as unified against bad creatures from outer space; audiences cheered. *Men in Black*, the top-grossing film of 1997 and an example of the contemporary American adventure-killing-comedy genre, used a similar ploy, however, in a more enlightened way; with both broad and subtle elements of post-modern self-reflective humor, it portrayed only *some* of the aliens as evil. Most of its aliens were as upstanding as us Earth folk.

The eloquent Christian apologist C. S. Lewis also used science fiction to drive home the importance of religion in the face of growing human knowledge and power. Human progress enables "us" to do whatever "we" want to do, in a bigger and stronger way than we did before. In fact, "we" always refers to a new locus of power in a focal subgroup of humanity (Lewis 1947). So far, "progress" has not sufficiently included understanding the meaning of goodness. Can peace technologies ever finally establish safety against the ever-growing threat of more powerful technologies of hostility? Something more than defense may be necessary. Is an initiative of wholeness possible, which at the same time preserves and nourishes human freedom?

Cultural innovations evolve much more rapidly than genes and overwhelm our genetically rooted emotional preparedness for things we encounter. A prominent example of this phenomenon, hypothesized by Konrad Lorenz ([1966] 1967), is in our willingness to kill fellow human beings at a distance, made all too easy by ever-"improving" technological innovations in weaponry. Examples range from the cosmic to the banal. They include such World War II events as the destruction of Pearl Harbor by aerial attack, the atomic bombing of Hiroshima, the rocket bombings of London, the firebombing of men, women, and children in Dresden, and recent uses of horrifying chemical and biological "poor man's nuclear weapons." There are also such common events as teenagers' drive-by shootings of acquaintances, made likely by the suggestion inherent in readily available assault rifles (Claxton and Gaines 1997).

However, in explaining an important truth, Lorenz surely oversimplified. We now know that murderous aggression within a species is by no means as rare in animals as Lorenz argued. Human beings, too, are much more willing to relish up-close killing than Lorenz acknowledged. A recently publicized set of examples is in Iris Chang's 1997 book on "the rape of Nanking" by Japanese soldiers during World War II (Schell 1997). More than 300,000 Chinese civilians were eagerly murdered in the most

decidedly up-close and low-tech sadistic ways. What kindles and fuels such breakdowns of decency and social order (Melloan 1998)?

ARE WE EACH OTHER'S INSTRUMENTS OR EACH OTHER'S
RESPECTFUL COMPANIONS?

Sadism is an extreme case. More general is our human willingness to use each other. Indeed, a major branch of philosophical ethics defines virtue in terms of a refusal to treat others instrumentally. Following Kantian ethics, people are to be viewed as ends in themselves, that is, as agents each of whom is entitled to his or her own purposes (Lombardi 1988, 11–12; Gewirtz 1982). There is a deep puzzle here, because human social synergies necessarily involve instrumentalities, including calculated ones. How and when does that work out to the good or the bad?

Religions may encompass the most crucial ingredients of peacemaking and of a thriving that is potentially prolonged indefinitely. Ralph believed this. One of the main ingredients of religions, indeed, may be their very nonrationality. Rationality and instrumentality are highly interrelated; rational plans exploit what is available in order to aim at a goal. In the view of Jewish theologian Martin Buber ([1937] 1970), extreme instrumentalism is an aspect of a modernist severe neglect of “I-You” relationships (see also Kaufmann’s prologue to Buber [1937] 1970) in favor of an “I-It” world: “The unbelieving marrow of the capricious man cannot perceive anything but unbelief and caprice, positing ends and devising means. His world is devoid of sacrifice and grace, encounter and present, but shot through with ends and means” (p. 110).

In contrast, religious ceremonies remind us of how each of us is esteemed in a context of something greater than all of us. I have recently tried to cope with this theme of nonrationality while remaining true to a scientific worldview by extrapolating some of Ralph’s ideas to a degree that might have made him uneasy. I have suggested that self-aware “suspensions of disbelief” might be a rational secular response to theistic practices and stories (Glassman 1996). That may or may not have been naive (see, for example, Heschel 1996, 100–26). Buber continued his line of argument with the following monotheistic-leaning brief parable from the philosophy of India: “The Brahmana of the hundred paths relates that the gods and the demons were once engaged in a contest. Then the demons said: ‘To whom shall we offer our sacrifices?’ They placed all offerings in their own mouths. But the gods placed the offerings in one another’s mouth. Then the Prajapati, the primal spirit, bestowed himself upon the gods” (pp. 110–11).

PRESENT LOCI OF SELFISHNESS MAY NOT BE WHERE YOU
FOUND THEM LAST

Phenotypic markers of genetic relatedness play only a partial role in man's crudeness to man. Common experience and history tell us of the deep ambiguity in relationships among family members. Brothers sometimes help brothers. Brothers sometimes kill brothers. The evolutionary genetic logic of the "selfish gene" helps to explain the roots of this conflict in terms of Haldane's famous insight about percentages of genes shared at various kin distances (see, for example, Campbell 1991; Wright 1994, 158–61). But people aggregate or aggress along varieties of dimensions other than kinship, and there remains a great deal of uncertainty in evolutionary theory about how natural selection affects such aggregative and aggressive tendencies. What are the ways in which we drain each other, and what are the ways in which we help each other to grow? When is the latter part of a larger emergent pattern?

Although contemporary habitual appeals to philosophical parsimony in evolutionary theory routinely assume that the "selfish gene" or "selfish chromosome" must be the locus of selection, the common observation that one of the most natural things in the world is to affiliate with others who are like us suggests a larger center of selection processes. People often seek similar others for informal conversations, they aggregate in college cafeterias, and there is a tendency toward ethnic homogeneity of neighborhoods. One of the fundamental principles in the academic subfield of social psychology is that it is often more rewarding to be with others whose similarities of habitual behavior (suggested by similarities of appearance) lubricate interactions. Although contemporary doctrine in evolutionary theory militates doubt that the social group is a locus of selection, there are imaginable ways in which group selection can occur (Wilson 1975). An additional, non-group-selective evolutionary argument can be made for similarity-affiliations in terms of what Richard Dawkins whimsically called "the green beards effect" (see Glassman, Packel, and Brown 1986). Perhaps there are other possible mechanisms encouraging similarity-affiliations.

In America, in part, ethnic clustering is a historical product of our diverse national origins and the time/space separation of waves of immigration of different groups. Relationships between "black" and "white" Americans have remained particularly problematic; this has compelled many of us to surmise that difficulties in respectful mutual affiliations and a tendency to treat others as means may simply be directly related to the conspicuousness of differences. However, we humans are sufficiently creative to easily manufacture visible differences in outward appearances when necessary, using various elements of clothing and behavior. Innate differences in appearance are not a prerequisite. The association of slavery with

race is primarily a Western phenomenon of several hundreds of years ending in the nineteenth century (van den Berghe 1978). Thus, the slavery/race association may be a distraction from a more general phenomenon.

Slavery has a large and varied history. Galbraith (1985, 123–25, 129, 131–32), in his illuminating economic “general theory of motivation,” explains the carrot and the stick. Until a society’s affluence permits emphasis on positive motivation beyond a small number of aristocrats, it makes little practical difference whether compulsion occurs in the form of hunger or pain, that is, whether threats arise from the loss of meager subsistence wages or from the nearness of the whip. Thus, “pecuniary motivation” may be associated in greater or lesser measure with compulsion. In some sense, as indicated also in Maslow’s famous theory of motivation (Myers 1998, 366), most poor people are enslaved in their available modes of achieving basic necessities. Only when real power comes to be more widespread in democratic affluent societies, identifications with the group and “adaptations” of the group to one’s own goals by people who achieve a degree of success as members of an organization, become possible as expressions of freedom. Galbraith’s “technostructure” thus seems to be more or less the same phenomenon that other social philosophers have called “the bourgeoisie.”

Strangely, this vigorous aspect of civilization is associated with quite a reduction in behavior that is manifestly genishly selfish. Economic progress is invariably associated with lowering of birth rates, sometimes to below the population replacement rate. This is true today of the bourgeois societies of Europe and the United States, when new immigration is not counted. Is this some sort of “error” or inherent weakness of human evolution? Alternatively, does this sort of regular phenomenon in history (Durant and Durant 1968; Colinvaux 1980) somehow often incorporate the leading edge of human progress? Does it exemplify the permissible degree of dissociation between genotypes and culturetypes, perhaps what Toynbee (1972) was attempting to understand by emphasizing the “limes,” or contacts between margins of older cultures? Is there sometimes some strangely indirect, strangely fertile supportive feedback loop from social behavior to apt genes (Glassman 1996)?

Galbraith reminds us that, before money and national economies developed, “slavery” was routine. Some humans have long treated each other very instrumentally, regardless of ethnicity. Yet, there have also traditionally been civilizing limits preserving a degree of freedom even before modern economies evolved. Listen to the Bible:

If any who are dependent on you become so impoverished that they sell themselves to you, you shall not make them serve as slaves. They shall remain with you as hired or bound laborers. They shall serve with you until the year of the jubilee. Then they and their children with them shall be free from your authority; they shall go back to their own family and return to their ancestral property. For they

are my servants, whom I brought out of the land of Egypt; they shall not be sold as slaves are sold. You shall not rule over them with harshness but shall fear your God. (Lev. 25:39–44, NRSV¹)

and,

Children, obey your parents in everything, for this is your acceptable duty to the Lord. Fathers, do not provoke your children, or they may lose heart. Slaves, obey your earthly masters in everything, not only while being watched and in order to please them, but wholeheartedly, fearing the Lord. Whatever your task, put yourselves into it, as done for the Lord and not for your masters, since you know that from the Lord you will receive the inheritance. . . . Masters, treat your slaves justly and fairly, for you know that you also have a Master in heaven. (Col. 3:20–4:1, NRSV)

Our human willingness to treat each other instrumentally seems more to be limited by particularistic habits in certain times and places but not really by any general bounds of skin pigmentation and ethnicity, kinship, long-term social proximity, or other simple dimensions. People form groups in various ways. The willingness to abuse others is not simply a byproduct of ethnic consciousness or racism, and using legislation or other typical secular means to alleviate our excesses of racial consciousness by itself does not seem likely to be enough to get at the fundamental issue.

SHOULD WE INVITE MORE ECONOMICS INTO OUR STUDIES?

In biobehavioral sciences Ralph emphasized sociobiology, genetics, psychology, and neuroscience. There is also a kinship between evolutionary reasoning and reasoning in economics (Frank 1988); economics might be viewed as a kind of quantitative anthropology of advanced civilizations. Both evolutionary reasoning and economics seek ways in which larger ecological boundary conditions propagate inward toward individuals (also see Campbell 1974). The academic field of economics, like any other, has its own ruminative traditions, tradition conflicts, and reductionisms. These may distract us, but we should be able nevertheless to use economic principles as a set of heuristic prompts toward a more scientific theology.

With that, I think we need to include particular references to how issues of political economy, population, urbanization, wealth, and the history of ideas interact with the ebb and flow of civilizations. We need to try mentally to uncouple these phenomena from religion and the religious attitude, then to synthesize: to carefully consider what religion is, what religion adds, and what untapped potential it may have.

The field of economics is a prime locus of secularist grand thinking, perhaps ripe to cross-fertilize with a critically realist theology. A meeting of economics and theology has the potential of illuminating each other's areas of blindness. Economics has progressed and ramified in many ways since Adam Smith's seminal work, but the fact that the phrase "the

invisible hand” remains a touchstone in popular thinking about markets suggests a fundamental meagerness in our understanding of human motivation; this quasi-theistic notion appears only once in Smith’s great work. We do not understand what factors enable civilization to propagate itself in the long run. What basic processes led to the collapse of “the hundred years’ peace” of the nineteenth century, resting as it did on the liberal state and the self-regulating market (K. Polanyi 1944)? Was this the same inherent vulnerability of Enlightenment thinking that twisted the French Revolution, then metamorphosed into self-indulgent forms of Romanticism and, later, solipsistic extremes of postmodernism (Wilson 1998)?

The need to better understand human motivation also suggests a need to more thoroughly study psychology and neuroscience. In academic disciplines, real wealths of knowledge are achieved in large part via the yeoman labor of normal science. We need to plumb and nurture that capital, while avoiding becoming trapped in the interstices. Academicians are sometimes cave-dwelling creatures. But in religion/science theorizing we have to be restless adventurers outside of the caves and above the interstices. We seek convergent coherence (as Donald T. Campbell, in for example 1988, eloquently explained in his writings) or “consilience” (Wilson 1998).

THE LIMITED INTELLECTUAL POWER OF REDUCTIONISMS

Ralph Burhoe cherished the amazing advances of the twentieth century in reductionistic sciences while he embraced theology. Better than anyone else, he pointed members of each subculture toward their own and the other’s marvels and shortcomings. He opened my scientist’s eyes to the intellectual virtues of theology. I might otherwise never have deigned to look toward it. As a practicing scientist I tried to explain to him some of the intellectual shortcomings in contemporary science that were beleaguering me.

The potent microscopic lenses of reductionisms have severe limits. Among other interests, Ralph remained intrigued by behaviorism at the same time as I was still rebelling against my earlier enchantment with its self-advertised completeness as a scheme for human understanding. Ralph valued the empirical and interpretive work of B. F. Skinner (see, for example, Skinner 1953) and older philosophical considerations about positivism, which he encouraged me to read more carefully. The range of possible understandings of human action from focal behaviorist principles—such as the principle of how instrumental conditioning axiomatically works—is surprisingly great (see, for example, Klein 1996) and yet is also very limited. This is true of reductionisms in general (Williams 1997). More than we realize, reductionisms are merely suggestive of things that we have already learned implicitly by more general observational means.

Some of the apparent derivational completeness of the axioms of reductionistic systems is illusory.

The seductive reductionistic logic of “the selfish gene” is explained superbly by journalist Robert Wright in his popular 1994 book on evolutionary psychology, *The Moral Animal*. But in the end, this logical scheme cannot bear us beyond the view that we humans are really ingeniously *immoral* animals, skilled at deceiving one another with patinas of altruistic principle. Wright colorfully dubs “nonzerosumness” the possibility of powerful synergies arising out of social organization. But it seems to lie somewhat outside the theoretical range of game theory and other standard evolutionary psychology fare to explain what determines when social interactions do successfully capitalize on the possibility of wholes achieving much more in total than the sums of their isolated parts could possibly yield. One impediment to the achievement of larger wholes is the problem of free-riding parasitism, or “cheating,” which may arise not necessarily out of venality, but merely from desultory variations in our reallocations of attention and effort. Although the “cheater” problem resolves itself clearly in game-theoretic models of evolutionary strategies, in real civilized life this problem is highly camouflaged among the many ways we instrumentalize each other.

BEYOND REDUCTIONISM: THE SEARCH FOR MEANING

Does touting secularism with feeling translate into the assertion that a healthy society can be centered on the golden calf? There is media-enhanced imagery of success all around us. And never mind all the fiction; bathe in the happy-talk on the morning “news” shows as a daily source of hope. The same news media also bring into your home, for your viewing indulgence, supernormal² imagery of neglect, abuse, and hostile human interactions. Wag your forefinger, cluck your tongue, nod “no” with your tight lips curled inward against your teeth; display dismay. Who needs a fire and brimstone preacher in these days of TV and magazines?

Is there anything in life to pay attention to that lies in between these moving, electronically graven idols of cheering-on and naughty-naughty? What record will future centuries have of the meanings of our lives today? By far, *most of real life lies in between these improvised daily parables, and most of life is worth more of our systematic attention*. Many of us at any given time are fairly happy or comfortable; many of us at any other given time (sometimes during the same day) are struggling and in need of sources of renewal.

A Pattern That Is Both Other and Within, with Infinite Reach. In academia, there is a growing awareness of need to better understand how highly contingent boundary conditions of places and times interact top-

down with the basic, known laws of nature. Sometimes such top-down understanding comes qualitatively, in a partial way, in stories and histories. Sometimes new systematic reductionisms are formed. This is being attempted in contemporary mathematical complexity theory, or “chaos” theory, in cognitive sciences and in brain theory. Because we are often pushing each other and pushing the world to the limits, science may never completely catch up by declaring once and for all a set of comprehensive closed-form laws of human social behavior.

Our storytelling is never complete. This makes human life interesting and impels us to reject the miring profanizations of liturgically congealing religion (for example, Tillich 1976; Buber [1937] 1970) and Kuhnian “normal science” (Barbour 1997). Much of “prediction” will always be in the becoming, understandable only in retrospect and in part. Science strives to understand the infinite “volume” of reality, but this volume is hyperdimensional, with many many waving surfaces and edges. There is inherent uncertainty. If human beings operating at these edges do so in good spirit, their intentions have a chance of touching the greatest potential that we hope is in the universe. This is not to speak of a mere “God of the gaps,” because the billowing edges may enfold to any part or all of the “volume” of reality.

MUTUAL CALIBRATIONS OF VALUES

How might a physical, social system remain relatively indeterminate in its interesting course, yet be tractable in terms of productive general understanding? In 1983, commenting at an Advanced Seminar of the Center for Advanced Study in Religion and Science (CASIRAS), whose title, “Keeping Body and Soul Together,” reflected its focus on Ralph’s papers on “God and Soul” and on “Coadapted Information in Genes and Culture” (reprinted in Burhoe 1981), I suggested that individual people are loci of restricted subsets of the *scaled value information* possessed by a culture’s population as a whole. In a small-world simplification, we might envision each individual as possessing only two value dimensions from among a culture’s set of value dimensions *A*, *B*, *C*, *D*, and so on. Any given individual would thus be “tuned” someplace between the two extreme ends of each of his or her two dimensions. It may be possible to develop this idea mathematically to show how many possibilities of complex interactions would emerge in various aggregations of individuals. A general characteristic of well-functioning groups must be that from within their overlaps and their differences people find ways to effectively and peacefully “refine” each other. Each looks outward somewhat egocentrically, but also somewhat tolerantly, from his or her present moment’s cumulative assessment.

An Important Human Artifact/Aid. Bible-like books serve as memory prosthetics to aid this process as it occurs in our rich real world. I hypothesize that the two necessary properties of bibles are: (1) their large collections of stories and discursive instructions must be rich, and they must contain poignant prompts to thinking about all possible moral dimensions in all likely contingencies or interactions; and (2) there must be adequately conflicting advice and implied advice; conflicting messages are crucial. In that way, bibles enable their human partners in a symbiotic organic relationship. The human makers/perceivers of meaning, then, always are faced with good choices from the garden of cultivated meaning-issues. This sort of heuristic helps the people of any epoch and civilization to experiment with combinatorial systems of values and behavioral responses that lead to lively ferment and healthy growth.

ORGANIZATION AND HEALTHY PRODUCTIVITY

When it comes to humans, there are many possible evolutionary quasi-stable states. There is an inherent instability of forms of altruisms, with synergistic symbioses often like houses of cards, built up on trust but relying for efficiency on automaticities, and so becoming more and more fragile as the group grows in size and the routes for reinforcing feedback grow longer. As social complexity increases, it becomes more probabilistic as to whether the targets of reinforcing feedback are the same as their respective sources. Doorways to free-riding become wider. Maintenance by natural selection grows ever more tenuous.

If a scientific analysis turns out to be possible, I hypothesize it will incorporate aspects of the styles of economics, politics, and behavioral ecology, as suggested earlier. We should come to be better able to perceive gestalts, perhaps in qualitative or humanistic terms. In the broadest human enterprises, perceptions of "Something Larger" tend to be made real by our acting as if they *ought* to be real. And yet the possibility of success depends on our living in a universe in which that possibility *is already a real property*. Theistically speaking, such a property may have a somewhat organic, personalistic character (Ashbrook and Albright 1997).

This is a possible meaning I see in the idea of cocreation, implicit in Ralph's notion of symbiosis and made more explicit by some of his friends (Hefner 1993; Ashbrook and Albright, 1997). I'm still unsettled as to where to balance myself between these personalistic views and Ralph's adaptation of theistic locutions to a more mechanistic scientific worldview. As I did also frequently assert to him face-to-face, there seemed a certain shallowness in associating a raw, bottom-up view of nature with innuendoes about larger purpose and in attributing to "God's will" whatever happens to happen or whatever humans happen to lay the way for. This seems too thin as God-talk, and merely leaps by fiat between *is* and *ought*.

And yet, without Ralph's having communicated his interest in religion with wonderful effectiveness, all I now have might not be much more than my bottom-uppish bolts and gears. His willingness to say that whatever happens in nature is, in some sense, "for the best" was really, I think, a subtle and powerful challenge to perceptive human scientists to try with all their might to see the implications of their choices. In the terminology of Ralph's friend Garrett Hardin, we must try to be "ecolate," or ecologically literate. Ask yourself the question, "And *then* what is likely to ensue?" Ralph thus encouraged us to say to each other something like the following: "Scientists, be responsible in considering what is for the best, because you are about to make it happen." In the way he couched his God-talk, Ralph seemed to understand that the most effective "ought" is subtly entailed within an "is."

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RALPH BURHOE JOINS MY LIFE

A Lesson Climbing Upstairs. Several years ago, during a Christmas break in December, was the last time I visited Ralph Burhoe at home. My wife, Harriet, and I called on Ralph and Calla, who then lived in a pleasant assisted-care apartment in Hyde Park, overlooking Lake Michigan. They had moved there from the wonderful apartment on 59th Street in which Ralph used to meet with his many friends and colleagues, where Calla's warmth was a vital complement, and which must have become a center of those others' lives as it did of mine. After we chatted for a while in the seventh floor apartment, Ralph suggested that we visit a physicist friend who lived on the eleventh floor. I began to head for the elevator but was checked by Ralph, who suggested that since exercise is good we should walk. Aware of Ralph's age and his long-standing heart condition, I looked at him incredulously. With quiet amusement he pointed out to this fiftyish whippersnapper that I was assuming too much, perhaps unreflectively. The stress of stair climbing is simply a function of how quickly it is done. We would take our time walking up.

Beginning to see the sense in this insight, yet reluctant to grant Ralph the last word, I contributed some wisdom gleaned from a recent "Ann Landers" (or "Dear Abby") column: Although gentlemen usually allow ladies to precede them, in climbing stairs it is not proper for men to walk behind women—for obvious reasons, I winked. Ralph chuckled. He and I then climbed the stairs together—very slowly—with Calla and Harriet following.

This fond memory also recalls the way Ralph taught me—interactively—the value of taking religion seriously, initially an incredible idea, which I had indulged with youthful kindly condescension. And it recalls so

many of our other personal contacts: Calla preparing a delicious meal for us and our three teenaged children, many years earlier; Calla's welcoming presence at religion and science seminars, and her cookies; Ralph and Calla visiting us in Lake Forest; our many conversations in their living room in the apartment on Fifty-ninth Street.

First Contact between Science and Religion. My first contact with Ralph came after I had not given much thought to religion for a long time. Like so many modern youngsters, I had let religious practice fall aside following my Bar Mitzvah. Perhaps it was vague spiritual longings, a few years later, that led me to become intrigued with existentialism precociously, during high school. That phase of my life followed an impish remark made by my history teacher, Mr. Wolfson. ("Don't tell your parents the word I'm writing on the board." And then, in large letters, he scrawled "EXISTENTIALISM.") I became captivated by aspects of psychology while in college. I wanted to learn how the mind works, what consciousness is all about. This has been a persistent fascination.

I have been intrigued by science for as long as I can remember back into childhood, perhaps led to some degree by the endless-frontier spirit of the 1940s and 1950s associated with atomic energy and other postwar innovations. I was a child growing up while the same spirit was leading a young-adult Ralph Burhoe to create fertile associations of American scientists (Breed 1992). My wife and I were married by a rabbi in 1962, but religion again receded rapidly. I joined in my in-laws' Passover seders, sometimes politely, once seriously offending my future father-in-law with wisecracks. During my graduate training, I recall now with visceral embarrassment, I was self-confidently obnoxious to a fellow physiological psychology graduate student, who was also a practicing Christian. In my cosmos of the time there was no fathoming his strange rumination that there is a something he called a "personal God," and I told him so directly. At the same time I was always a handful for my graduate teachers in neuroscience and psychology in the way I pressed them for grander meanings in their experimental research.

During the 1970s I was fortunate, as a young professor, to have found steady funding for an empirical neuroscience research program concerning animal models of recovery from brain damage, cortical localization of touch and movement, and side effects of antischizophrenic drugs. Harriet, having a master's degree in biology, worked part-time with me in the lab. On weekends our three kids played in the science building with toys we had brought for this purpose, a black and white television, and old IQ test kits and other psychology artifacts. We published a number of findings, some of them in collaboration with undergraduate students at Lake Forest College. With my yen for larger issues and answers (remember "existentialism"), I found the time during the early and middle 1970s to write a

sequence of three articles joining evolutionary theory and general systems theory with some ideas about brain and psychology, which were published in the journal *Behavioral Science*. Among the inspirations for these ideas were the writings of philosophically inclined scientists Konrad Lorenz, Karl Pribram, Alexander Luria, Richard Gregory, Peter Milner, Ross Ashby, and several others. Among them also was Donald T. Campbell, whom I had the opportunity to meet in 1975—about the time he gave his inspiring presidential lecture to the American Psychological Association meeting in Chicago on the new field of sociobiology, its significance for social psychology, and the possible importance of “well-winnowed” cultural traditions, such as religious practices.

I first heard from Ralph Burhoe in a letter he wrote to me, prompted by his having come across an abstract of my fourth theoretical publication, immodestly titled “How Can So Little Brain Hold So Much Knowledge? Applicability of the Principle of Natural Selection to Mental Processes” (Glassman 1977). He suggested we talk. I recall that my first reaction to the letter was to be dubious, but I was also flattered; moreover, by my tenth year out of graduate school I had learned to be more polite in my responses to others, even if their concern was something as outside of rational ken as religion. I visited with Ralph, and we became friends. Over the next couple of years Ralph helped me write my first article for *Zygon*, “An Evolutionary Theory of Teaching and Proselytizing Behaviors” (Glassman 1980), which attempted to explain in a dutifully nonmystical way just such communicative outreach phenomena as the two of us had been practicing with each other.

Growth of Friendships. There followed twenty years of fruitful contacts with the many people who had gathered around Ralph informally or within groups having the acronyms CASIRAS, CCRS, and IRAS (the Institute on Religion in an Age of Science). Some of the most rewarding gatherings were the smaller meetings at Ralph’s or Phil Hefner’s apartment, the Lutheran School of Theology (LSTC), Meadville-Lombard, or a building just up University Avenue from LSTC, which was the home of CCRS for several years. My 1996 *Zygon* paper on “cognitive theism” developed largely out of such interactions with the members of the Chicago Group of CCRS, during approximately monthly meetings from 1989 to 1991. The opportunities to listen to and speak with scientists and theologians have been stimulating and motivating. This has also happened in the series of “Advanced Seminars” organized by Phil Hefner, the “Epic of Creation” series organized by Tom Gilbert and Phil, the Templeton Foundation Symposia, and other gatherings. It is good to participate actively in meetings with a group of intelligent and wise friends.

Although I’ve never allowed myself the security that I imagine comes with more forthright faith in God, these sources of friendship and

accomplishment have been as important personally as intellectually. Perhaps I'm now as religious as I can be for someone so thoroughly imprinted on secular, skeptical traditions. Don Campbell (1991) pointed to origins of religion in urban civilization. Maybe he is correct, although my own quintessentially urban upbringing in New York City was conducive to a brashly humorous variety of urbane skepticism, as was true for many other quipful city kids. That stubborn wryness has been two-edged; it also has encouraged defense against the pious pretenses in overreaching unripe sciences. (Here, I have not yet learned to be polite.) Today, I am tolerant of the mythological locutions of religions and am intrigued by them. I think they are telling us something far-reaching and important, and even something real, in an efficiently coded form.

My one-hour drives between Lake Forest College, on the Chicagoland North Shore, and the meetings in Hyde Park of the groups that Ralph bred and nurtured have for over twenty years now involved an interesting transition. With the motorist's necessary attention to the difficult Dan Ryan and Edens Expressways, I am in a vehicle in which consciousness shifts between a secular humanist environment, typical of today's liberal arts college, and a world in which religion is prominent. I drive between a state in which the notion of God is a precious oddity among faculty, or a largely unexamined accoutrement of early identity among students, to a parallel universe in which the notion of God as real is taken for granted. Both places are now home. The religion-and-science theme in Hyde Park has tempered my additional feeling of difference as a Jew among mostly Christians. It has served as a gateway to empathic understanding of some of the meanings of Christianity and recently to a desire to better understand Jewish theology.

A Return Without Leaving; Kindling Realizations about Freedom. Aware that I have been coming to appreciate Christianity a great deal, I recently decided—in honor of my father and mother, my two grandmothers and grandfathers, and my wife (not very religious people, yet with fairly strong Jewish identity) and my somewhat religious mother-in-law—to give Judaism a bigger chance, knowing what I know now. Rather than seeking advanced academic stuff at this point, on a Saturday morning while the conventionally observant were in synagogues, I drove to a nearby Barnes and Noble superstore. Things got out of hand, and when I looked up after about two hours, I had selected a small library. (How much did I spend? Don't ask.)

And I've begun to read this microlibrary. Now, as an intellectual raised in the traditions of psychology and neuroscience, I am struck by the contrast between those lines of thought and the insistent, eloquently audacious theistic positions of Abraham Heschel and Martin Buber. Their prose styles often seem like poetry, impressionistic, perhaps echoing

Romantic traditions; and yet they clearly stipulate hard-nosed conclusions about the limits of reductionism and the complementary need to look openly for patterns in nature. I had already reached these same conclusions by other means, with the encouragement of writings by Konrad Lorenz, Donald T. Campbell, and Michael Polanyi.

But new insights are occurring with this new reading. For example, it has taken me till now to grasp what it means to use the strange turn of phrase “Lord of History,” a concept that has puzzled me since I first encountered it in Ralph’s work (Burhoe 1975). Perhaps my scientific attitude has been rooted more than I realize in ancient Greek philosophical traditions, emphasizing eternal forms or laws. The phrase “Lord of History” goes with the idea that freedom is a human fundamental rather than a mere “condition of the gaps” in behavioral scientific understanding. Life is worth living not only for the successes of prediction and control. Life is to be lived for the surprises.

I think there is a relationship between this perspective and the human condition of partial *separation*, in the sense that Tillich often spoke of. The meaningfulness of individual lives and the constructive *reachingness* of our lives, individually and in symbiotic groups, emerge from this. Up till now, I have been doing science and religion largely in the vein of the “apology” genre. I “apologize” for being sentiently alive. I have felt the compulsion to derive that fact by delving into the logic of biology and behavior. I continue to feel compelled in that way, but Heschel (1951) has reassured me that the obvious is worth valuing in its own right: Our own living existence in every moment is a source of radical amazement! And I have begun more clearly to hear Christian colleagues and a Muslim colleague describe similar conceptions.

Recently, I have been trying to understand the idea of transcendence in terms of materialistic metaphors of much lower dimensionality than the whole of reality dynamics. Heschel (1951, 243; 1996, 154–63) insists that God cannot simply take us or leave us; God actually *needs* humans. In a material metaphor, I think this means that human beings comprise a substrate like a body of water, which bears *waves* in many directions. Or we are like a substrate of combustible substance, across which a *flame* passes. Lorenz (1969) similarly likened life to the “fulguration” of a grass fire moving rapidly in patterns across a prairie. However, we are a stiff-necked substrate rather than interchangeable molecules; our individual particulars strongly affect the flow of history. A commitment to the idea that God likes and needs that dynamic of affairs reminds us to also try to work together for something greater, respecting each other’s individuality.

Seeking Maturity. Early on, and in many meetings as we worked on my first paper for *Zygon*, Ralph insisted that there was something in evolution beyond my partial understanding of the logic of genetic inclusive

fitness. I fully understood, from reading Lorenz and Eibl-Eibesfeldt (1975), that successes of behavioral mechanisms are not generally contingent upon conscious insight into their adaptive value. I nevertheless found it hard to avoid following up on my understanding of natural selection by believing that a person has to cheer on his own genome. "Is" compels "ought." It somehow seemed appropriate to "root root root for the home genes; if they don't win it's a shame." Ralph cautioned me about a certain immaturity in this view, even as he admired sociobiological theorizing and those who did it well. In my turn, I continued to be exasperated by what appeared to be a gap in Ralph's logic. He seemed to see too much independence in the flow, through history, of genotypes and culturetypes. With my nose to the sociobiological grindstone I saw a need for tighter feedback coupling between cultural patterns and the genetic base on which they rode.

There was a curious counterpoint between Ralph and me in regard to behaviorism and sociobiology. Ralph cherished these schools of thought, attempts at comprehensive reductionistic analysis of animal and human life, schemes beginning with few axioms and building upward toward an understanding of people. He cherished them, but I have been possessed by them. Ralph's easy reference to parallel genetic and cultural tracks of information flow through history, therefore, always seemed too cavalier. The word *cavalier* does not go with Ralph, but he seemed to me to take too much for granted within what has recently come to be called "the standard social science model." He seemed to be indulging in a form of mysticism or supernaturalism, not acknowledged as such merely because of its ubiquitous familiarity. Ralph seemed to lend himself to it, as Don Campbell sometimes did, even while they themselves gave lucid explanations of evolutionary logic.

To me, it has not seemed possible that culture could sit in such loose contact with its genotyped substrate, like oil on water. If individual people try to fly too far culturally, in pristine elevation from the genes that underlie their aptitudes, motivations, and defense reflexes, natural selection will have the last, inevitable word. Icarus will fall. The Tower of Babel will decay to disorganized babble. Yet today I am rethinking this by considering, first, how human complexity might comprise less obvious, longer routes of sustained feedback regulation, perhaps even with dynamic hand-offs among multiple, changing means and, second, that some sort of additional natural processes may underlie human creativity.

I miss Ralph's presence. I miss the reminders he used to give and the new lessons, but I also eagerly look forward to more life together with our mutual friends and to pursuing our world lines as Ralph redirected them.

Several weeks ago in my Developmental Psychology course I made a show of sneaking into the classroom something wrapped secretly in a

brown bag while smirking at the students with as much flamboyant lasciviousness as I could muster. Next, I tried to elicit sympathy for our textbook's explanation and apparent strong advocacy of the idea of bringing "children's rights" within a state, national, and international legal framework. I then furtively opened the classroom door, stuck my head out into the lobby and looked in both directions, withdrew my head, closed the door, and revealed that the brown wrapper contained . . . a Bible! God is far more illicit than sex in a contemporary psychology class. It was late in the period when we got to this, so I simply encouraged the class to think about possible alternatives to drawing the legal system further into families. I suggested that in so doing they might reread "that famous piece of Paul's prose about love." Aware that as a Psychology Department chairperson it would be unseemly for me to appear too fluent with religion, I then slowly added, "I think it's in—ah—First Corinthians—ah—chapter . . ." This second hesitation was immediately filled in by one of the students in the class. "Thirteen," she reminded us. Ralph might have enjoyed that.

NOTES

1. New Revised Standard Version.
2. A term from ethology referring to a contrived stimulus whose exaggerated characteristics compel a response more certainly than the natural releaser (see Eibl-Eibesfeldt 1975).

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