

COOPERATION


Beyond the Age of Competition

Edited by Allan Combs

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General Evolution Studies
Volume 4

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COOPERATION

Beyond the Age of Competition

Edited by

Allan Combs

University of North Carolina at Asheville
USA

Gordon and Breach

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INTRODUCTION TO THE SERIES

The World Futures General Evolution Studies series is associated with the journal *World Futures: The Journal of General Evolution*. It provides a venue for monographs and multiauthored book-length works that fall within the scope of the journal. The common focus is the emerging field of general evolutionary theory. Such works, either empirical or practical, deal with the evolutionary perspective innate in the change from the contemporary world to its foreseeable future.

The examination of contemporary world issues benefits from the systematic exploration of the evolutionary perspective. This especially happens when empirical and practical approaches are combined in the effort.

The World Futures General Evolution Studies series and journal are the only internationally published forums dedicated to the general evolution paradigms. The series is also the first to publish book-length treatments in this area.

The editor hopes that the readership will expand across disciplines where scholars from new fields will contribute books which propose general evolution theory in novel contexts.

INTRODUCTION

The modern world that was created in Newton's astronomy and Descartes metaphysics comes to us steeped in competition. The Cartesian concept of causality, based on the idea of matter thrusting itself against matter, calls forth Ovid's image of nature before the original creation:

Chaos, so-called, all rude and lumpy matter,
Nothing but bulk, inert, in whose confusion
Discordant atoms warred . . .

Humphries 1955, 3

In time, the image of warring matter spread well beyond the sciences of physics, astronomy and chemistry; it extended into the heart of biology, where it took the form of competition and the struggle for survival. From there it diffused into the social sciences to provide a rationale for a whole spectrum of inequities. Indeed, the idea of competition has nowadays acquired such loose and extensive currency that it is casually applied to a host of social and economic concerns as well as to the natural world in general.

The importance of competition as an *idée fixe* of the modern world arises not only from mechanistic science, it is also a legacy of nineteenth-century economics. In *The Origin of Species*, Darwin credits Thomas Malthus for the idea of "the struggle for existence." Darwin was evidently influenced deeply by this notion of the primacy of cutthroat competition, giving it center stage in his own work. As a consequence of the connection between Malthus and Darwin, modern ideas of struggle and competition, especially the notion that human life is competitive because nature itself is so, amount to a thoroughly laundered *laissez-faire* philosophy of economics, masquerading as biology.

A dramatically different theme pervades the essays in this collection, a single motif that is expressed in many forms. It stretches from biological symbioses to friendships that "happen by themselves," from the moral sensitivity of the individual human being to issues of transnational governance. It is, strangely, a motif that lacks a single title, though there are many words for different aspects of it. The term *symbiosis*, for example, has strong biological connotations, while *synergy*, though a seemingly excellent choice, is given a very specific cultural meaning in the essays by

Ruth Benedict and Ralph Abraham. The term *cooperation* has the drawback of suggesting a human social context as its principal referent, but was chosen because it highlights a contrast with notions of competition.

The motif of cooperation is heard at many levels of the cosmos. Willis W. Harman, for instance, suggests that at base it connects to the even more universal theme of holism. A complementary way to think about this is in terms of systems in evolution. Whether we look to the level of single biological cells that join together symbiotically to form larger organisms, to plants and animals that interact in living ecologies, to men and women mutually engaged in human societies, or to nations and multinational units interacting in a global order, we are confronted everywhere with complex systems comprised of communities of seemingly disparate parts, or subsystems, each engaged in reciprocal, mutually resonant and supportive activities. Such activities are necessary for the continuance of the greater community, without which the individuals could not exist. Cooperation, in this most elemental sense, is a necessary condition for the creation of complex biological, social, political and economic systems.

The broad theme of cooperation is presently emerging on many fronts, accompanied by a weakening of the centrality of competition. Indeed, the assumptions that undergirded that centrality are being questioned on all sides and have been found wanting. In some instances the meaning of competition itself is changing, as is the case in certain business communities. In others, the whole idea of the importance of competition has come into question, as is the case in biology. At the same time, the motif of cooperation is appearing with increasing frequency. The purpose of this collection of essays is to sketch the emergence of this motif in a variety of its forms.

The idea of cooperation is consonant with the postmodern shift now visible in science and elsewhere, away from isolation and objectivity and toward context, involvement and participation. This shift was first felt most dramatically in the physics of the early twentieth century. Since then it has touched virtually every branch of science, as well as economics, political thought and the emerging values of a fledgling world culture. This shift evidently represents a fundamental cultural bifurcation, one that for the most part has gone all but unnoticed.

A number of the facets of this transition are chronicled in the following pages. As well as a shift toward holism in many areas of thought, they include the appearance of a dramatic movement away from classical "survival of the fittest" notions of evolution, and with them a departure from the cutthroat economics and business practices implied by the old Darwinian worldview.

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Ralph Abraham, professor of mathematics at the University of California, Santa Cruz, has been active on the research frontier of dynamics in mathematics since 1960, and in applications and experiments since 1973. Recognized as one of the founders of chaos theory, he has taught at Berkeley, Columbia and Princeton Universities, and has held visiting positions in Amsterdam, Paris, Warwick, Barcelona and Basel. Dr. Abraham is the author of *Linear and Multilinear Algebra; Foundations of Mechanics* with J.E. Marsden; *Transversal Mappings and Flows* with J. Robbin; *Manifolds, Tensor Analysis, and Applications* with J.E. Marsden and T. Ratiu; and *Dynamics: The Geometry of Behavior* with C.D. Shaw (in four volumes).

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Thomas Berry, a well-respected national leader in the field of ecology, is a historian of culture and religion and has recently come to call himself a geologist. Between 1966 and 1979 he developed the history of religions program at Fordham University. More recently he has served as president of the American Teilhard Association and is currently director of the Riverdale Center for Religious Research. Thomas Berry has authored numerous articles and books, including his recent *The Dream of the Earth* (Sierra Club Books), and the forthcoming *The Universe Story* with physicist Brian Swimme.

Ruth Benedict (1887–1948) was among the most prominent of American anthropologists. She was particularly interested in relationships between culture and personality, and her work dominated much of American anthropology during the 1930s and 1940s. Though she was an early and strong proponent of cultural relativism, in 1941 she introduced the notion of cultural *synergy*, suggesting that some cultural configurations are more humanistically viable than others. She was a professor of anthropology at Columbia at the time of her death.

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Alfie Kohn is an independent scholar who writes on human behavior and social theory. He has lectured at universities and organizations across North America and Europe. In addition to contributing to various magazines and journals, he is the author of three books: *No Contest: The Case Against Competition*; *The Brighter Side of Human Nature: Altruism and Empathy in Everyday Life*; and *You Know What They Say . . . : The Truth About Popular Beliefs*. He lives in Cambridge, Massachusetts.

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PART ONE

Psychology

The term *cooperation* is most familiar in the context of human beings working together toward common goals. In the first essay of this section, writer Alfie Kohn discusses many of the common misconceptions about cooperation and competition, showing that, despite popular notions to the contrary, cooperation is much more effective and productive. Psychologist Galen Bodenhausen's excellent review of the social psychology literature shows us the conditions in which people are most likely to cooperate with each other, and when they are not. Systems theorist and psychologist David Loye connects brain, mind and society in an examination of the roots of moral sensitivity and the implications for a humanly viable social order. At the end of this section, psychologist Allan Combs presents a thumbnail sketch of the archaeology of consciousness, exploring the genius of Jean Gebser and the implications for the meaning of cooperation in his various evolutionary structures of consciousness.

CHAPTER 1

Cooperation: What It Means and Doesn't Mean

ALFIE KOHN

WHAT OUR WORDS SAY

A visitor to the United States who was briefed about some of the connotations that cling to our words could deduce quite a bit about our attitudes and behavior. Consider, for example, that many elementary school teachers use the word *cooperation* chiefly to elicit obedience: “I want you all to cooperate now” means “Do exactly what I tell you.” They have another name for situations where children actually help each other to learn: This is called *cheating*. (The implication, of course, is that genuine cooperation has no legitimate place in these classrooms.)

Educators with an interest in public policy, along with economists and businesspeople, have an interesting term to refer to excellence or productivity: *competitiveness*. Thus is the concept of doing well collapsed into the concept of triumphing over others—even though the two ideas are not only distinct in theory but often antithetical in practice. If we have no language to talk about success without victory, however, the very idea may eventually cease to be real for us.

One last example should suffice here. The word *altruism* is often reserved for extraordinary acts of selfless, saintly behavior such as diving into freezing rivers to rescue drowning children or spending one's life caring for lepers. The most salient feature of this usage is its peculiar narrowness: No one, after all, would suggest that the word *aggression* be employed to describe only mass murderers. More than this, the decision to set the standards for altruism so high does each of us an injustice by seeming to put part of our repertoire beyond our reach. In *The Plague*, Camus (1947/1972) has his narrator refrain from extravagantly praising the honorable efforts of residents of the disease-infested town. His rationale is that

by attributing overimportance to praiseworthy actions one may, by implication, be paying indirect but potent homage to the worse side of human nature. For this attitude implies that such actions shine out as rare exceptions, while callousness and apathy are the general rule. The narrator does not share that view.

Moreover, a highly restricted use of *altruism* communicates the reassuring message that a few larger-than-life characters have become specialists in helping others. In taking on a life of this sort, they relieve us of the responsibility of having to go and do likewise. We call them exemplary but they are not literally examples to us. Indeed, such usage has the effect of turning altruism into an all-or-nothing proposition. If our private definition of the word ends with: “See ‘Mother Teresa,’” and if we are sure we could never be like her, then we may stretch out comfortably

in a life devoted to the self-satisfied satisfaction of the self. (This is why either/or thinking is always so popular: it makes choosing easy.) Here we may witness a self-fulfilling prophecy in action: If I believe altruism is not within my reach, I will not bother trying to act that way—or seek to cultivate it in my children. Then I can point to the selfish behavior that results and say, “You see? It’s just human nature to act this way.”

How we use words, then, does more than reflect a way of thinking about our species; it also contributes to certain practices and beliefs. In examining such phenomena as cooperation and altruism, which is my task here, it is important to be precise about how these terms are used and to peel off the layers of connotation that serve more to obscure than to reveal.

From a social psychological perspective, cooperation means that a group works toward a goal in such a way that each individual’s success facilitates the other’s—or, in the stronger version, that each person can attain the goal only if the others do so as well. This arrangement, sometimes called “promotive (or positive) interdependence,” (Deutsch, 1949) can be distinguished from one in which each person’s success is either facilitated by the other’s failure (competition) or irrelevant to what happens to anyone else. Strictly speaking, a purely cooperative *structure* stipulates that everyone sinks or swims together irrespective of each individual’s feelings or beliefs about the others; a cooperative *attitude* refers to a preference for mutual facilitation even in the absence of a requirement to this effect.

Perhaps the best way to explore the concept of cooperation—and, at the same time, to make the leap from theory to practice—is to explore what it does *not* entail. A few mistaken assumptions result from interpreting the word too broadly. For example, managers and teachers may assume they have established structural cooperation merely by eliminating competition. This is incorrect because, while the absence of competition may be inherently desirable (Kohn, 1986), and while it may be a precondition for cooperation, the absence of negative interdependence is not tantamount to the presence of positive interdependence. People may instead pursue their goals independently. Equally inaccurate is the assumption that people who are working in groups must be cooperating. Again, this is a necessary but not sufficient condition, a prerequisite but not a guarantee, since interaction does not assure interdependence.

Far more interesting and heuristically valuable is the opposite mistake: reading the idea of cooperation too narrowly, exactly as is done with *altruism*. I want to linger on each of three requirements that are frequently—and, I think, mistakenly—established for an arrangement to qualify as cooperative: the absence of conflict, the presence of intergroup competition, and the existence of an altruistic motive. In each case, what originally presents itself as a semantic question (How can *cooperation* best be defined?) quickly resolves into a compelling empirical question (What happens when people work for, with, and against each other?).

COMPETITION VERSUS CONFLICT

Conflict is not only pervasive in the workplace and the classroom, between family members and between nations; it is also probably inevitable. More to the point, and

less obvious to some who value cooperation, conflict is desirable. Children become less egocentric and more cognitively sophisticated as a result of discovering that other people see things differently and discussing those differences, according to Piaget (1928). Adults who strive too hard for unanimity for fear of conflict will often make poor decisions (Janis, 1982). The absence of conflict may suggest that people are frightened (to challenge a superior), resentful, or bereft of their rational faculties (as illustrated by the total agreement among cult members). It is no coincidence that the word *challenge* means both to require someone to use his full range of abilities and to call something into question. As the feminist psychologist Jean Baker Miller (1976, pp. 13, 130) put it, "Growth requires engagement with difference. . . . Conflict . . . becomes dangerous when its necessity has been suppressed."

While the word *conflict* denotes disagreement, disunity, or dissension, however, it does not imply the presence of competition. Likewise, cooperation does not require harmony or even concurrences. These distinctions are, in my experience, too rarely made by people who value collaboration, synergy, and the like. In any given setting, *the relevant question is not whether conflict will occur but rather whether it will occur in the context of competition or cooperation.*

The difference between these two versions of conflict is palpable whenever people get together to make decisions. One person at a meeting may raise an objection in the earnest hope of preventing the group from endorsing an unwise policy; another may do so in order to score rhetorical points and sound impressive. It is particularly important that teachers understand that they need not choose between creating a classroom in which students must arrive at a forced and artificial consensus, on the one hand, and one in which conflict is present but manifests itself as an adversarial exercise, such as debate, on the other. The former asks children to deny reality (because they know that disagreement exists) and deprives them of a real education; genuine learning does not smooth over or soothe. The latter shifts the lesson from whatever students are discussing to the goal of winning (Kohn, 1986, 1987). Far preferable is a third alternative: inviting disagreement but nesting it in a framework of positive interdependence.

David and Roger Johnson, who have spent the better part of two decades researching and refining the idea of cooperative learning, have referred to this optimal balance as "constructive controversy," "creative conflict," or, more poetically, "friendly excursions into disequilibrium." Their research suggests that this approach is generally preferred by students to either "concurrence-seeking" or debate, and that it promotes both more effective learning and more interpersonal attraction than the other models (Johnson, Johnson, and Smith, 1986). Similarly, in the workplace "it is the competitive approach to controversy that disrupts, not controversy itself; controversy within a cooperative context facilitates decision making and relationships" (Tjosvold and Deemer, 1980, p. 594; also see Tjosvold, 1986).

In short, people who are cooperating are working together to learn or produce something, encouraging and depending on each other but not necessarily seeing eye-to-eye. Nothing about the concept of positive interdependence requires that members of the group avoid conflict, and there are good data to suggest that they ought not to do so.

DOING WITHOUT A COMMON ENEMY

The predominant experience with cooperation in our society consists of having a group of people work together in order to defeat another group of people. The group may be a sports team, a company, or, in its most dangerous incarnation, an entire country. Sadly, even certain models of cooperative learning pit children from different groups against each other (Slavin, 1990, chap. 4). While some activities featuring a blend of intragroup cooperation and intergroup competition, such as sports, are widely acclaimed precisely on the basis of promoting teamwork, the most salient lesson they actually teach is that the only reason to cooperate is to defeat a common enemy.

Such a message is mixed at best and exceedingly damaging at worst. The important question to ask is whether intergroup competition is necessary in order to realize the advantages of cooperation. Here a review of the somewhat obscure research on the subject should prove useful.

To begin with, let us discard the canard that something about the nature of groups demands the presence of a common enemy, that every We must have a They. It is a socially constructed decision that results in the attempt to motivate individuals in groups—or bind them more tightly together—by establishing cooperation as a means to defeating another group. Obviously this technique can be effective (at least temporarily, and with significant costs), but there is no reason to think it is inevitable.

Is it, for that matter, more effective than carefully structured cooperation without intergroup competition? Consider the issue of productivity. Some of the older studies in social psychology set up the cooperative condition so that groups had to compete against each other, which led some critics, reasonably enough, to ask whether the achievement gains that resulted might have been due to the intergroup competition. By now, however, enough data have been collected so that we can be quite certain the answer is no. Unequivocally, we find that people's "performance benefits [from] cooperative conditions whether [these conditions involve] additional intergroup competition or not," according to one review of the research (Pepitone, 1980, p. 30). More recently, Johnson and Johnson (1989, p. 46) reviewed seven studies that explicitly contrasted cooperation with and without intergroup competition. Overall, no significant difference in outcome was found. In their review of nearly 200 studies comparing cooperation with individual competition in the classroom, meanwhile, the overwhelming advantage of the former was somewhat diminished in those experiments that included intergroup competition. Bringing individuals together so they can compete against other groups "does *not* enhance achievement and may decrease it," the Johnsons concluded.

Is intergroup competition necessary to achieve the *social* advantages of cooperation? Again, the classroom research says no. One study with college students (Dunn and Goldman, 1966) found not only that intergroup competition led subjects to view those from other groups negatively (a much replicated finding that is no less disturbing for being predictable) but that it was not helpful in developing feelings of acceptance within each group. Johnson and Johnson's (1989, p. 122) massive meta-analysis supports this conclusion: "Cooperation seems to promote better relationships when intergroup competition is absent."

Outside of the classroom, a series of studies by the Dutch psychologist Jacob Rabbie has likewise found “no evidence for a greater ingroup solidarity in the [competitive] condition. If anything there is a slight but nonsignificant tendency in the opposite direction” (Rabbie and de Brey, 1971, p. 243). This, he pointed out later, debunks the “very popular notion . . . that intergroup competition leads to ingroup cohesiveness” (Rabbie et al., 1974, p. 55). Even in the Army, another study found, the men in each squad did not come to look upon each other more favorably, or to know each other better, when they were in competition with other squads (Julian et al., 1966).

Many studies of adult cooperation do not specifically test for the effects of intergroup competition, but here, too, the absence of an outgroup does not seem to interfere with the formation of group identity—an identity that, in turn, leads people to put aside narrow considerations of self-interest (e.g., Dawes, Kragt, and Orbell, 1990): People will usually cooperate with others in a group so long as they are given an opportunity to feel a sense of belongingness to that group. In sum, as psychologist Harvey Hornstein (1976, p. 18) put it, feelings of intragroup amity simply do not require intergroup enmity; the former “can spring forth independently, as a natural response to one’s fellows.” Given that the productivity unleashed by cooperation also does not require a common enemy, there would seem to be no reason to encourage competition between groups, much less to graft this phenomenon onto the very idea of cooperation.

WORKING WITH VS. WORKING FOR

In a society that venerates competition and solitary effort, the suggestion that we ought to work together is regarded as either refreshingly humanistic or suspiciously un-American. The fact that writers who point out the advantages of cooperation to teachers, managers, and policy makers are often seen as radicals or visionaries says more about our devotion to narrow individualism than it does about cooperation itself. The simple truth is that most proponents of teamwork emphasize—and most participants realize—its benefits to each individual who takes part.

This may not be surprising given that the very definition of *cooperation* refers to interdependence, not altruism. “Cooperative behaviors traditionally have been defined more in terms of consequences for the self than the other, that is, as coordinating one’s behavior with that of another in order to achieve one’s goal” (Eisenberg and Miller, 1987, pp. 111–113). Helping may be present during cooperation but typically as a means (one of several, in fact) rather than as the end.

The implications of this are several. For one thing, cooperation makes for strange bedfellows, bringing together the likes of Rousseau, with his talk of community, and Hobbes, who was essentially recommending a cooperative solution to the threat of anarchic violence. (Because we share an interest in peace, we can and should agree to abide by the dictates of a central authority, he said.) The latter reminds us that cooperation, as such, leaves egoistic motivations undisturbed, which is a terribly useful fact for practitioners to emphasize when urging people to cooperate: No student or employee is being asked to forego benefit to herself; rather, she will benefit as a result of assisting, and working with, others.

The fact that cooperation does not require altruistic motives undoubtedly makes the concept more saleable in a culture saturated in the ideology of individualism. But, depending on one's values, it may also prompt doubts about the ultimate value of cooperation. Is our intention merely to provide one more strategy whereby the self-interested individual can reach his goals—or is it to move beyond this egoistic framework? If the latter, then cooperation no more addresses this issue than advising people to save their money addresses the problem of materialistic values.

Consider the way American children are typically exhorted to share or help. Parents often declare, "Now, Jason, if you don't share your tricycle with Jennifer, she won't let you play with her dinosaur"—a strategy more likely to inculcate self-regarding shrewdness than genuine concern for others. With respect to helping, we read fairy tales to children that are replete with magical creatures or royalty who pose as unfortunates and *reward charitable acts*. We also instruct them in religious traditions that emphasize egoistic inducements for generosity and promise that those who act rightly will be rewarded with a pleasant afterlife or a state of enlightenment, sometimes by earning the equivalent of cosmic merit badges. In a newer version of this egoistic appeal—one not restricted to children or the religious—we are told that volunteering our time for good causes will bring us a healthier immune system, lower cholesterol levels, and longer life.

In short, when we as a society are not busy justifying or rewarding selfish behavior, we are promising that prosocial action will redound to the benefit of the actor. I have argued elsewhere (Kohn, 1990) that these inducements are ultimately counterproductive, that there is little basis for the assumption that people ultimately respond to others' needs only for self-interested reasons—or even that appeals to self-interest are effective over the long run at promoting such helping. My point here, though, is to draw an analogy to cooperation: We may wish to aim higher than "coordinating one's behavior with that of another in order to achieve one's goal." At least I do.

This is not to suggest that looking out for one's own interest is an illegitimate motive. Each of us does so constantly, in looking both ways before crossing the street, choosing the most appealing dish from a restaurant menu, and so on. Consideration of self-interest may well be universal, and it is surely not objectionable in itself. The trouble is that interest can be compounded to the point that one loses sight of principle. The fact that taking care of oneself is morally neutral or even praiseworthy can easily become a rationalization for excessive concern with one's own desires, for overlooking or even actively trampling the claims of others.

But we can go even further. Yes, we should strike a balance between individual and group activity, and between responding to one's own needs and those of other people. But because the second alternative in both of these contrasts may be motivated by self-interest, we should add another balance—namely, that between egoism and altruism. Sometimes we should help others simply because they need help. And sometimes we should act not merely with others, but for them.

The philosopher Lawrence Blum (personal communication, 1988) has expanded this into a three-part formulation with respect to the attitudes parents and teachers should encourage. Ideally, he says, we want children (1) to derive pleasure from helping others, (2) to help others (at least on some occasions) even when doing so is

not pleasurable, and (3) to develop relationships in which their pleasure and that of others are intermingled.

BEYOND ALTRUISM

Blum's third notion is intriguing because it opens us to the possibility of transcending the altruism that, in turn, transcended cooperation—or, for those whose tastes run to the nonlinear, to circle back to a higher form of cooperation. The question of whether one is (or should be) attempting to benefit the self versus the other—a question, as we have seen, that is relevant irrespective of whether one is alone or in a group—rests on a bed of individualism. Here is a self with a bundle of interests and preferences. The egoist says it always attempts to maximize them. The non-egoist replies that it sometimes looks after the interests of another self. But both take for granted the existence of separate selves, each with its own set of (sometimes overlapping) interests. It is important to recognize, as Edward Sampson (1977, p. 770) did, that egoism and altruism are “in opposition only in an individualistic setting; their opposition is not written in granite, genetics, or our fundamental human psychology.”

Fleshing out the alternative to this individualism is a life's work. Here I will simply say that one may help another person not primarily to benefit oneself *or* to benefit that person but to benefit the “us” that has emerged from the relationship between the two. This does not involve a blurring of identities or a mystical fusion; it is not to lose sight of the two individuals who make up the us. It is, however, to recognize that there are some occasions in which one could not—even with perfect self-knowledge—reduce a prosocial act into an attempt to benefit either of the individuals involved. Someone may find himself acting without intending to benefit *just* the other *or* himself *or* the two separate selves added together. Pressed to explain, he will not say simply that he cannot tell what he has in mind, but rather that the question is misconceived because his reference point is something beyond either of the two partners: it is the connection between them.

Thus, if the question is asked, “But what do you get out of helping?”, the self-aware egoist replies, “Peace of mind” or “A respite from guilt.” The altruist replies, “Maybe nothing, but that's OK; personal gain was not the point of my helping.” The person thinking about “us”—there is no obvious label for him—replies by challenging the premises of the question, since the idea of self- versus other-gain seems, above all, irrelevant. The relationship in which such helping occurs (and out of which it grows) begets a motive that cannot be understood by most social scientists, mired as they are in egoistic premises, any more than a three-dimensional object could be apprehended by a two-dimensional creature.

For Blum (1980, p. 76), relationship, and specifically friendship, nudges us beyond the idea of altruism. He is worth quoting at length.

The terms “egoism” and “altruism” as usually understood serve us ill in describing acting from friendship. . . . Friendship involves persons being bound up with one another. The different sorts of emotions and feelings which the friends have towards one another get their meaning and significance from the entire relationship of which

they are a part. . . . This is why the caring and the acts of beneficence in friendship are not separate from my own interests, from what is personally a good to me; it is not, in that sense, “disinterested.” [It is also, he notes later, not just motivated by a *combination* of egoism and altruism.] In fact friendship is a context in which the division between self-interest and other-interest is often not applicable. The friendship itself defines what is of importance to me, and in that sense what is in my interest. In that sense I do not generally sacrifice my own interest in acting for the good of my friend. I act with a sense of the friendship’s importance to me, even though it is the friend whose benefit I directly aim at (i.e., which is my motive for acting), and not my own.

Two years later, Carol Gilligan (1982, p. 74) proposed a strikingly similar formulation that grew from her study of the moral development of women and girls. Beyond caring for the self and caring for others, she wrote, there exists a “perspective [that] focuses on the dynamics of relationships and dissipates the tension between selfishness and responsibility through a new understanding of the interconnection between other and self.”

Because this sense of “us” develops over time, it is reasonable to speak of some combination of egoism and altruism giving way to a relationship. Such a transformation has important implications for prosocial behavior. When we first meet, conventional motives explain my helpfulness; as we become friends, I begin to think and act in terms of us. Similarly, empathy initially may be a matter of vicarious distress or other-oriented sympathy and concern, but eventually it is a reflection of our relationship.

To return to our point of departure, something of the sort describes the change that often occurs in group interaction. Harry Stack Sullivan (1953, pp. 55–56) suggested that cooperation means that “I play according to the rules of the game to preserve *my* prestige and feeling of superiority and merit. When we collaborate, it is a matter of *we*. The achievement is no longer a personal success; it is a group performance. . . .” This has been the experience of many teachers who structure their classrooms to facilitate cooperative learning: At first, children help each other to learn because they have to, because they are told to or even, regrettably, because the teacher has made their grade contingent on the others’ achievement (Kohn, 1991). But typically a sense of group identity, an us, develops and the egoistic incentives become less salient (although they do not always disappear altogether). Now, instead of tutoring you because I will benefit from your improvement, I am genuinely interested in the performance we manage as a group. This group identity, described by Robyn Dawes and his colleagues among others, does not appear to be a matter of members’ weighing the benefits to self and group before selecting the latter. That there may be a trade-off is an assessment made by an outside observer—one steeped in an individualistic frame of reference. The issue for the group-identified participant, as for the person who feels connected to a friend or lover, is no longer simply “What can I do for her—and will it be at my expense?” but “What can I do for us?”

This brings us back to the issue of how words are defined. What I am describing here may be what some writers have meant all along by *cooperation*. For the sake of clarity, I prefer to use that term as Deutsch and others do, presuming the existence of a self-interested motive or bracketing the question of motive altogether. Once we

are speaking the same language, though, we are free to address the more fundamental issues, such as whether and why people can work and learn and live together.

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CHAPTER 2

Identity and Cooperative Social Behavior: Pseudospeciation or Human Integration?

GALEN V. BODENHAUSEN

What is at stake here is nothing less than the realization of the fact and the obligation of man's specieshood. Great religious leaders have attempted to break through the resistances against this awareness, but their churches have tended to join rather than shun man's deep-seated conviction that some providence has made his tribe and race or class, caste, or religion "naturally" superior to others. This seems to be part of a psychosocial evolution by which he has developed into *pseudo-species*. . . for man is not only apt to lose all sense of species, but also to turn on another subgroup with a ferocity generally alien to the "social" animal world.

Erik Erikson, 1966, p. 153

The concept of identity is a cornerstone in the thinking of the great psychosocial theorist, Erik Erikson. In the epigraph above, Erikson writes of one central aspect of identity, rooted in "tribal psychology," that is based on association with human subgroups. Identification with such subgroups rather than with the human group as a whole is what Erikson refers to as pseudospeciation, and it is so powerful that it can, as Erikson laments, produce atrocities and brutality that are collectively known as "man's inhumanity to man." Genocidal movements such as Naziism represent the most virulent form of such inhumanity, but physical and psychological cruelty on the part of one group toward those perceived as outsiders is a commonplace (if not ubiquitous) aspect of human culture (cf. LeVine and Campbell, 1972). In this article, the consequences of group identification for cooperation within and between social groups will be explored. Research evidence will be reviewed that makes it abundantly clear that pseudospeciation of the sort described by Erikson is a two-edged sword. On the one hand, it promotes cooperation *within* social groups, overpowering the selfish interests of individuals in favor of collective interests. On the other hand, it inhibits cooperation *between* groups, and indeed, it fosters conflict and mistrust. Although other aspects of identity undoubtedly can affect the tendency to be cooperative (e.g., role status within a hierarchical group structure, Messé, Kerr, and Sattler, in press), the focus here will be on identity based on group membership *per se*. After reviewing work documenting the impact of group identity on cooperative and competitive behavior, implications for the promotion of intergroup harmony will be discussed.

THE NATURE OF GROUP IDENTIFICATION

That people tend to identify themselves with social groups is part of our evolutionary heritage. Because of the adaptive advantages of group living arrangements, social grouping is a common phenomenon among mammal species. This is what the phrase “tribal psychology” signifies. Among human beings, two psychological forces, one cognitive and one motivational, become crucial in understanding the origins and consequences of such social groupings. Philosophers and psychologists have long realized that categorization is the human mind’s adaptive response to a vastly complex social environment. When the social perceiver is categorizing other human beings, a fundamental decision is implicit in any categorization scheme that might be adopted: One of us, or one of them? Wherever social boundary lines are drawn, the perceiver is either including or excluding herself from the groupings that arise. Around this very basic realization, the eminent European psychologist Henri Tajfel built one of the most influential theories of social psychology, social identity theory (Tajfel, 1981). The essence of this powerful theory can be conveyed succinctly. Because social categorization inherently involves self classification, we reflexively divide the human world into ingroups and outgroups. Ingroups are all those categories with which we identify or in which we hold membership, and outgroups are the remaining categories. A person’s social identity is comprised of all of her various ingroup memberships (e.g., nationality, race, gender, religion, profession, etc.). Like many psychologists (e.g., Rogers, 1961), Tajfel postulates a basic human motive for positive self-regard. Inasmuch as one’s group memberships form an important basis for one’s identity, it becomes desirable to view ingroups as positively distinct from outgroups, thereby enhancing one’s self-regard. In combination, the cognitive tendency toward simplifying, categorical modes of thinking and the motivational tendency to view oneself and one’s groups favorably produce the psychological seeds of ethnocentrism and its behavioral manifestations.

In a series of elegant experiments, Tajfel and his associates have demonstrated that virtually any basis for social categorization is sufficient to produce ethnocentric behavior such as ingroup favoritism in reward allocation. A study by Tajfel, Flament, Billig, and Bundy (1971) is a prototypic example. English school boys served as the research participants. They viewed reproductions of paintings by Paul Klee and Wassily Kandinsky and indicated their preference for one artist over the other. By this procedure, the group of boys was divided into Klee fanciers and Kandinsky fanciers. This categorization often cut across pre-existing friendships in the group. (Unbeknownst to the boys, their group assignment was actually randomly determined by the experimenter; this was possible because it was not revealed which painter had painted which picture, and the boys lacked knowledge that would enable them to make this determination themselves.) After this minimal categorization, each boy was asked to assign valuable points (later to be traded for coins) to other boys (but not to themselves) who were identified only by their group membership (Klee vs. Kandinsky fanciers). A seemingly reasonable strategy under these circumstances would be to divide the points evenly among all the boys, but by far the dominant tendency was to assign more points to members of one’s own group, defined by apparently shared aesthetic preferences. In this and dozens of subse-

quent studies, ingroup favoritism emerged after even the most trivial sorts of social categorization (see Brewer, 1979, for an excellent review). As social identity theory asserts, moreover, the act of favoring one's fellow group members (but not oneself) in these minimal intergroup situations is linked to increases in one's personal self-esteem (Oakes and Turner, 1980).

The studies conducted by Tajfel and his associates clearly show that the process of ingroup identification produces a tendency on the part of individual group members to try to benefit other members, at the expense of members of the outgroup. In order to feel good about one's own group, people have a tendency to disparage salient comparison outgroups. The implication of this pattern of behavior is that group identification will facilitate cooperation within the group but also facilitate competitiveness toward the "less worthy" outgroup. It is important to note another implication of Tajfel's studies. Sociobiologists investigating the nature of altruism have often hypothesized that altruistic and cooperative behavior should be found within kin groupings because such behavior facilitates the survival and transmission of shared genes to future progeny (e.g., Trivers, 1985), and they point to such groupings as providing the evolutionary impetus for ethnocentric tendencies (e.g., Ike, 1987). Kin groupings are certainly of unquestionable importance to one's social identity. Without doubting the plausibility of such sociobiological thinking, Tajfel's studies indicate that group identification and beneficent behavior toward fellow group members can arise readily in the absence of any kinship ties. As Vine (1987) aptly puts it, "the epigenesis of our ethnocentric tendencies *does* involve a modest element of genetic priming—but the most critical causal factors are psychosocial ones" (p. 61). Tajfel's theory and experiments provide a valuable description of the specific psychosocial forces underlying Erikson's description of the pseudospecies mentality. We turn next to an examination of the consequences of this mentality within the ingroup.

GROUP IDENTITY AND COOPERATION IN SOCIAL DILEMMAS

One of the more interesting and significant topics of social research concerns cooperative or uncooperative behavior in social dilemmas. A social dilemma occurs when there is a shared finite resource pool and the following conditions are met: (1) Mutual cooperation leads to acceptable levels of the resource for all parties using the resource pool; (2) Noncooperating individuals can gain even better personal outcomes at the expense of other users of the pool; but (3) If many individuals choose not to cooperate, no one will receive an acceptable outcome. Garrett Hardin (1968) described a prototypic case: The tragedy of the commons. Historically in rural English villages (and elsewhere), individual herdsmen let their livestock graze on a shared area of pasture known as the commons. This pasture supported only a finite number of animals, but as long as each individual used only his fair share of the resource, each could make a successful living, and the resource could be replenished. However, an individual could enhance his own livelihood by adding more animals to the commons. If only one or a few individuals chose this more selfish option, they would benefit at the expense of others. If many individuals

chose this option, the commons were overgrazed, were not replenished, and the welfare of everyone was imperiled. The situation was labelled a "tragedy" by Hardin because in actuality, the selfish option was favored by many, so overgrazing and economic disaster were a frequent consequence of the social structure of the commons. Self interest took higher priority than collective interest, to the ultimate detriment of all. Examples of analogous situations are abundant in the contemporary world.

Students of human nature will hardly be surprised by the selfish behavior often in evidence in social dilemma situations. Certainly the dominant view of man, conveyed by such diverse intellectual figures as Machiavelli, Hobbes, Nietzsche, Skinner, Freud, and Darwin is of a dedicated egoist. Consequently, in devising strategies for promoting cooperation in social dilemmas, the emphasis has often been on coercive threat and punishment or social sanction for selfish defection (e.g., Hardin, 1968). But recent experimental investigations of behavior in social dilemma situations has revealed an effective alternative solution for reining in this egoistic tendency. When they have formed an identification with the collectivity of resource pool users (i.e., an ingroup identity), individuals seem quite willing to cooperate for the mutual benefit of all concerned. Thus, promotion of group identification may itself be sufficient to produce cooperation (Campbell, 1958). By this process of transpersonalizing one's identity, one may come to value positive collective outcomes even more than personal ones (Brewer, 1979).

Three studies by Kramer and Brewer (1984) provided initial evidence that group identification can in fact promote cooperation in a "commons-style" social dilemma. They used a computerized experimental task that involved having several research participants make individual decisions about using a shared resource pool. The pool contained points that could later be traded for cash. Over a series of trials, each individual could take between 0 and 10 points, after which the pool of points would be replenished in proportion to the amount of remaining ("unharvested") points. To sustain the resource pool, each individual would have to take about five points or fewer per trial. If most people follow this rule, everyone could continue to use the resource infinitely. If many people overharvest, however, the pool will be steadily depleted across trials. As in the commons of historical England, this situation represents a sore temptation for the egoist, who can reason to himself, "If I take just a few more points, my total will rise faster." Information about the behavior of other participants was manipulated by computer feedback. The critical manipulation concerned the participants' sense of social group identity. Half the subjects were led to think of the other participants as compatriots and fellow ingroup members (a shared superordinate identity), while the other half were led to think about the other participants as part of an outgroup (a differentiated subordinate group identity). In one experiment, for example, the student participants were encouraged to think about the other participants either as fellow University students (shared identity) or as students with a different academic major (differentiated identity). In all three of the studies, individuals in the shared identity condition showed significantly more cooperative restraint in their harvesting behavior.

Dawes, van de Kragt, and Orbell (1988) have pursued this line of thinking further in another set of compelling experimental studies. In these experiments,

the effects of group discussion on cooperative behavior was examined. The variations and replications are too numerous to describe in detail, but the results consistently show that discussion enhanced cooperative behavioral tendencies. The reasons for this enhancement were found to lie in an increase in group identity and a concomitant increase in genuine concern for the quality of others' outcomes. Moreover, discussion enhanced cooperative behavior only when the beneficiaries of the cooperative action were one's fellow group members (the average proportion of cooperative behavior under such conditions was .69); when members of a different experimental group would be the potential beneficiaries, cooperation levels were no different from the no-discussion groups (around .30). Based on their extensive experimental work, Dawes et al. (1990) concluded that "cooperation rates can be radically affected by one factor in particular, which is independent of the consequences for the choosing individual. That factor is group identity. Such identity can be established and consequently enhance cooperative responding in the absence of any expectation of future reciprocity, current rewards and punishments, or even reputational consequences among other group members. Moreover, this identity operates independently of the dictates of conscience" (p. 99).

These studies show that identification with a human subgroup, even when defined in relatively trivial ways such as "fellow University students" or "people in my experimental group," can exert a strong pull for cooperation and beneficence toward fellow group members, just as Tajfel's social identity theory implies. When group identification is founded on a more important subgroup membership (e.g., shared ideology, ethnic heritage, nationality, etc.), history is full of examples of frequent and sometimes extreme self-sacrifice for the greater good of the ingroup. Japan's kamikaze pilots are perhaps the most salient of many examples. But this example highlights the other side of subgroup identification. Heightened ingroup identification comes at the cost of antipathy toward other subgroups. This tendency, which Erikson described so well, follows directly from Tajfel's theory, and it also flows from models of the cultural evolution of cooperation (e.g., Boyd and Richerson, 1990). A complete picture of the effects of group identity on cooperation requires a careful consideration of this more disturbing consequence of in-group solidarity.

PSEUDOSPECIATION AND INTERGROUP COOPERATION

In our world of increasingly interdependent social groups, finding a means for successful intergroup cooperation and harmony seems imperative for human survival. As Erikson noted, the impediments to such cooperative intergroup action seem formidable because of the pseudospecies mentality. Dramatic evidence of this tendency was provided in the classic social psychological study conducted at Robbers Cave by Sherif, Harvey, White, Hood, and Sherif (1961). The participants in this study were 11-year-old boys at a summer camp in Oklahoma known as Robbers Cave. The researchers planned to take advantage of this situation by dividing the boys into two arbitrary groups to observe the consequences of this social categorization on intergroup behavior. The two groups (the "Rattlers" and the "Eagles") were

initially segregated; almost immediately, heightened ingroup solidarity and mutual helping emerged within each group. The researchers planned to hold competitive events to induce intergroup antipathies. However, even before such competitions were held, hostility toward the outgroup were evident. The boys actively sought competition with the other group, which came automatically to be viewed as their opponents. The hostilities took the form of verbal harassment, bitter invective, theft and destruction of property, and physical assault. Moreover, the boys' ratings of their respective ingroups were highly favorable (in fact, near the ceiling of the rating scale), but their ratings of the outgroup were significantly lower. In short, the ingroup alliance was accompanied by negative sentiments and behavior toward the outgroup.

Another field experiment conducted at a New England campsite by Sherif and Sherif (1953) involved an interesting twist on the Robbers Cave procedure. In this case, the segregation of boys into subgroups was delayed for a week, until after the boys had a chance to form spontaneous friendships with fellow campers. When the group categorization occurred, it cut across these blossoming friendships. Perhaps having friends as members of the other group would defuse the tendency toward intergroup hostility. It did not. At the outset, more than 60% of the boys named an individual in the other group as his best friend, but after subgroup identification took effect (and the intergroup hostilities emerged), fewer than 10% of the boys named outgroup members as friends. In fact, fraternizing with outgroup members was systematically punished by other ingroup members. One dramatic historical parallel to this demonstration of the power of social categorization to neutralize and even reverse previous loyalties can be found in the cases of first-order relatives who found themselves on opposite sides of the Mason-Dixon line during the American Civil War. The research on intergroup behavior shows us that when identification with a particular subgroup is strong, the prospects for intergroup cooperation can be severely compromised by animosity that develops toward outsiders, animosity that is often labelled prejudice.

A survey of the anthropological literature has revealed ethnocentrism to be a commonplace phenomenon (LeVine and Campbell, 1972). The attitudes and behaviors defining ethnocentrism are just those revealed in these experimental studies: positive affect, loyalty, cooperation, and self-sacrifice within groups, but negative affect and hostility between groups. It is interesting to hypothesize, as many sociobiologists have (see Reynolds, Falger, and Vine, 1987), that man's proclivity toward prejudice and xenophobia arose precisely because these attitudes were adaptive in competitive ancestral environments. However, as Erikson notes, the advent of weaponry of mass destruction could very well "lead man's adaptive genius to its own defeat" (1966, p. 154). We have seen so far that mankind has a strong tendency to form identifications with groups in which memberships are held, and this has many positive consequences for behavior within the groups in question. Moreover, these identifications seem to arise even when the criteria for social categorization are minimal. But the downside of this tendency, the push toward ethnocentric pseudospeciation, now confronts us with an unprecedented potential for tragedy. What can be done about it? The problem is undeniably complex, and there are no simple answers. However, some basic issues about the

nature of social identity are clearly relevant to whatever complex answer might be formulated. In the remainder of this essay, some psychological prerequisites for the establishment and maintenance of mutually beneficial intergroup cooperation will be considered.

STRATEGIES FOR PROMOTING INTERGROUP HARMONY

In terms of social policy, perhaps the most frequently proposed solution for poor intergroup relations has been the instigation of contact between the groups. The thinking behind this policy is fairly obvious: People from different groups hold erroneous negative beliefs about each other based on a lack of knowledge, and by encouraging interaction, these prejudices will be whittled away as the people get to know the "real" qualities of outgroup members. If nothing else, contact permits the possibility of real communication between group members, a process that is often subject to bias and distortion in formal intergroup contexts (Bodenhausen, Gaelick, and Wyer, 1987). School desegregation and busing programs represent dramatic tests of this contact hypothesis, and the evidence that emerged from these social experiments hardly inspires confidence in the value of contact per se as a panacea for the problems of race relations in America. Cases in which these policies demonstrably improved race relations were exceptional. In a summary of empirical evidence about the consequences of contact, Amir (1969) concluded that contact has beneficial implications for intergroup relations only when it occurs under certain rather specific conditions. Among these were: (1) a generally positive climate; (2) opportunities for cordial, personal interactions with outgroup members; and (3) shared superordinate goals that require intergroup cooperation for their successful attainment. Given these stipulations, it is not hard to see why desegregation programs often failed, centered as they often were in very negative climates. But why do these particular conditions promote intergroup harmony? It is precisely these elements that encourage individuals to forge a broader social identity, one that is inclusive of people formerly seen as "outsiders" or members of some other, less fully human species. Working together with such individuals toward shared goals, a new group identification is likely to emerge, and the intragroup benefits described in the previous section (e.g., positive relations, willingness to cooperate and incur costs for the group as a whole, etc.) are likely to follow. Contact of this sort is likely to be successful because it leads people to trade in a narrow social identity for a more encompassing one.

Readers unfamiliar with Sherif and colleagues' field experiments on intergroup hostilities among school boys may have wondered whether the researchers ever did anything to try to ameliorate the hostility and viciousness that arose in the course of their investigations. In fact they did, and we return to this research now because it exemplifies the salving power of superordinate goals in reducing intergroup antipathy and promoting cooperative behavior. In the midst of all the negative behavior that pervaded the Robbers Cave campsite, the researchers arranged to stage some apparent crises that required the Rattlers and the Eagles to work together if a successful solution were to occur. The crises occurred over a period of about a week,

and involved, for example, problems with the water supply and mechanical breakdowns of equipment. In order to deal with these problems, the boys from each group did indeed work side by side. They eventually even decided to all contribute money so that a film could be rented for viewing by all campers. By the end of this week of activities directed toward superordinant objectives, harmony was restored to the campsite. At the end of the camp, most of the boys even insisted that everyone ride together back to the city, rather than in a group-segregated arrangement. Common problems (and common enemies) have great potential to elicit cooperative action among antagonistic groups. But how do the benefits of such cooperation occur? Miller and Brewer (1986) articulated several alternative models of the possible processes involved, but chose one particular model as the most useful conceptualization in guiding their own thinking and research. In this model, working together toward goal attainment has a direct effect on social categorization. Specifically, it decreases salient identification with one's subgroup. Other beneficial outcomes (increased acceptance of outgroup members, decreased stereotyping, etc.) follow from this principal effect. Empirical support for the view that changes in social identification mediate the positive consequences of superordinant goals was recently provided by Gaertner, Mann, Dovidio, Murrell, and Pomare (1990). So it seems that in facing their common problems together, the boys adopted a broader social identity with significant benefits accruing to all in terms of successful problem solving *and* greatly improved social relations.

Contact, by itself, is not enough; contact involving coordinated efforts toward common goals seems to be the prerequisite. If mere desegregation was not sufficient to improve race relations among school children, perhaps structured learning experiences requiring members of different groups to work together could prove beneficial. This was the hypothesis behind a number of educational techniques devised for racially diverse student groups. The "Jigsaw Method" proposed by Aronson, Stephan, Sikes, Blaney, and Snapp (1978) is one example. In this technique, members of different racial groups are given learning problems to solve, but the problem is distributed among individuals in such a way that only by working together can an acceptable performance emerge. Meta-analysis of this and similar classroom methods indicates that they are indeed successful in reducing hostility directed toward children who are members of outgroups (Johnson, Johnson, and Maruyama, 1984). Of particular importance for the present purposes, these benefits were found to follow from reduction of ingroup/outgroup differentiation (Brewer and Miller, 1984; Miller and Brewer, 1986). To use Erikson's terminology, these techniques work because they stifle the tendency toward pseudospeciation.

Getting groups to act in concert to achieve mutually valued goals is thus a road to intergroup harmony. The act of cooperation itself, even if initiated grudgingly, is a tonic for intergroup hostility. But the tonic is potent only to the extent that the cooperative behavior results in a modification of social identity. Interesting experimental confirmation of this can be found in a study conducted by Worchel, Ferris, Samaha, Axsom, and Schweizer (1978). They created subgroups of participants that competed against each other in an initial phase of the study, but they later were given tasks to solve jointly. In half of the cases, the two subgroups were identified by different, distinctive uniforms (specifically, white vs. red lab coats) that were worn

throughout the study. Under this condition, it was expected to be more difficult to disregard one's identity as a subgroup member. In the other half of the sample, people in both subgroups were given white uniforms, thus making it easier to "erase" the previous subgroup identity during the cooperative portion of the study. As expected, the benefits of cooperative action in terms of improved intergroup sentiments were significantly greater in the absence of differentiating uniforms. One implication of this research is that when subgroup identity is associated with obvious physical markers (e.g., special attire, skin color, etc.), it may become more difficult to override such identities, because the markers serve as constant reminders of the differences between the groups. This research further bolsters the conclusion that social identity is central to intergroup harmony. Identifying with subgroups, or one's pseudospecies, limits the beneficial effects of cooperative intergroup contact.

The formation of a salient superordinate identity among two human subgroups is a distinct and different outcome from the personalization of the outgroup. Merely to recognize the individuality of outgroup members is not the same as identifying oneself with them in some broader social categorization scheme. While the individuation of outgroup members is a desirable outcome it is unlikely to produce the kinds of positive social consequences that a shared identity can. A study by Gaertner, Mann, Murrell, and Dovidio (1989) provides a demonstration of this point. In a two-phase procedure, groups of six participants were initially segregated into two three-person groups. Having formed these subgroup identities, ethnocentric biases emerged in ratings of ingroup and outgroup members. In the second phase of the study, two types of recategorization were accomplished. Participants were either encouraged to think of themselves as a single six-person group (inclusive identity) or as 6 separate individuals (personalization). Both procedures reduced ethnocentric bias, but they worked in different ways. In the personalization condition, the bias was eliminated because the ratings of the former ingroup members decreased. In the inclusive identity condition, however, the intergroup bias was reduced because the ratings of former outgroup members increased. This study confirms, once again, that social identification has positive consequences for relations among those sharing the identity, benefits that do not follow from an individuated view of others. Thus, strategies for combatting the pseudospecies mentality that focus on personal identities only cannot be expected to have the same benefits as those that focus on a shared superordinate identity.

CONCLUSIONS

Any given individual is inevitably a member of many different groups, including a kin group, a nationality, an ethnicity, etc. When identification with any of these groups is salient and strong, cooperation and even self-sacrifice for the benefit of other group members are elicited. These groups can be (and tend to be) viewed as pseudospecies meriting one's highest loyalty. But every individual is also a member of the group *homo sapiens*, a true species possessing undeniable genetic integrity. At this moment in time, the future of our planet seems to hinge on our ability to

forsake our pseudospecies identities and their associated antipathies toward outsiders in favor of a commitment to our mutual survival as a species. In 1966, Erikson wrote, "In all parts of the world, the struggle now is for anticipatory and the more inclusive identities" (p. 165). There is certainly no shortage of serious problems confronting our species that require joint effort for their successful remediation. The "common enemy" that may yet unite humanity is undoubtedly ourselves: our exploitation of the ecosystem and our general failure at civilized conflict resolution among other deficiencies. It is sadly not hard to envision ecological crises of such magnitude that the internecine quarrelling of the various would-be pseudospecies must be replaced by coordinated human action to secure our very survival. In a more recent essay, Erikson (1985) noted some grounds for optimism about the human prospect. The development (and sharing) of technologies for food production and distribution on a global scale, for example, may alleviate the sorts of resource scarcity that fuel intergroup hostility. He also noted with hope the sympathetic response that tends to be elicited in humans by all infants of the species, even those who are progeny of other subgroups. The infant is the common denominator of the species, the human being prior to pseudospeciation; the culturally undifferentiated human infant serves to remind us of our shared humanness.

In a world filled with ethnic and national conflict, it may seem rather naïve and pollyannaish to call for or expect widespread identification with humanity as a superordinant group. Moreover, ingroup cooperation has been found to be inversely related to group size (Komorita and Lapworth, 1982), so identification with the largest possible human group may not evoke the kinds of harmonious behavior patterns easily. But large-scale ingroup loyalty does occur, and there is no reason why it should be impossible in principle on even larger scales. Nor does this species identification necessarily have to involve the elimination of cultural differences between groups. In the final analysis, however, real harmony and voluntary cooperation may only come through valuing each other for our common specieshood *and* evaluating each other as individual persons rather than undifferentiated members of an alien, inferior pseudospecies. Attempts to coerce, bribe, or legislate intergroup harmony are likely only to have transitory success at best (cf. Kelman, 1958). It will certainly not come easily, but perhaps through constant attempts to create opportunities for cooperative action and dedicated efforts to understand the origins of intergroup hostilities, we can eventually find the common ground we share as humans. It will require the insights not only of social psychology but of all the diverse disciplines of the academy, many of which are represented in the present collection of essays. Perhaps by transcending our parochial scholarly identities, we can together find effective solutions to the focal problem of our times, human relations. "For man to realize his specieshood and to exchange a wider identity for his pseudospecies means not only the creation of a new and shared technological universe, but also the outgrowing of prejudices which have been essential to all (or almost all) identities in the past" (Erikson, 1966, p. 154).

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CHAPTER 3

Cooperation and Moral Sensitivity

DAVID LOYE

Traditionally, morality has been viewed from the perspective of religion, spirituality, or secular philosophy as a matter either “above” or “outside” the realm of science. Beginning with Immanuel Kant, however, very slowly over the past 180 years there has grown up within social science a tenuous new science of morality.¹ For a variety of reasons, this scientific study of morality is now at a critical turning point. Not coincidentally, this comes at a critical crossroads in our evolution which, while fearing the worst, many hope may prove to be the great turning point for our species.

I have found through my own research into the origins and operation of moral sensitivity that a key question that repeatedly comes up is of the relation of cooperation to moral sensitivity. This paper briefly outlines what brain research and both old and new perspectives on our biological and cultural evolution reveal of this relationship.

COOPERATION AND THE BIOLOGICAL EVOLUTION OF MORAL SENSITIVITY

Works ranging from Darwin’s *The Descent of Man*² and Peter Kropotkin’s too often forgotten classic *Mutual Aid*³ to the recent work of Humberto Maturana⁴ and several members of the General Evolution Research Group make apparent to those who are receptive to such a view that moral sensitivity is not something that suddenly pops into being with ourselves, ostensibly the highest of organisms. We may find its roots in the biology of Vilmos Csanyi⁵ and Francisco Varela,⁶ in Ervin Laszlo’s new projection of “cosmic connections,”⁷ in the thrust of Bela Banathy’s “evolutionary learning.”⁸ More directly, this is the clear implication of a three book cycle which Eric Chaisson is completing.⁹ Such sources make it evident that moral sensitivity is something that can be found emerging in life, level by level upward.

Particularly striking in this evolutionary journey is how scores of formal biological studies¹⁰ (also summarized elsewhere in this volume by Robert Augros and George Stanciu) show cooperation in the form of symbiotic relationships at early and mid levels of the developmental tree. Indeed, if we do no more than read the newspapers we find regular examples—for example, again and again the story of dolphins going to the rescue of humans endangered by drowning or by sharks.

In my own research, I see this track of evolution as evidence for a new organic and systems theory of moral sensitivity I am developing.¹¹ That is, a theory of moral

sensitivity as being organic to life itself—as being an emergent part of life itself, as being emergent within evolution; and as being part of an evolutionarily emergent higher guidance system. In other words, this is directly opposed to the view of moral sensitivity as a separate “something” that mysteriously pops into being only with ourselves, or that can only be imposed upon us, for which there is no genetic base or receptivity.

One sees it all come together most vividly in the human brain. Here we see the magnificent rise of structures upward through the organisms—all this development so ingeniously nestled together, stage by stage, within our own brains. Within our own development as embryos, we see the progression neurologist Paul MacLean popularized as from “reptile” to “horse” to “human.” We see the bulb atop a spinal cord become lower, mid, and then at last the “higher” brain, the cerebrum of mammals, reaching its apex of development with ourselves.¹²

Through immersion in the findings of brain research, I came upon a compelling new perspective on the relation between cooperation and moral sensitivity in this way. My original interest was in prediction, or how this remarkable brain of ours works in advancing our “futures sensitivity.”¹³ Through this research I became aware of how prediction of the future is heavily dependent on certain aspects or areas of the frontal lobes of the cerebrum. We know this from the fact—established by the work of the Russian neuropsychologist Alexander Luria¹⁴ as well as many others—that if a part of these frontal lobes is diseased or blown away, no longer can this impaired human deal adequately with the future.

But I kept running into a great difficulty. It was that certain other frontal lobe capacities were interwoven with prediction that were confusing my study. This is a familiar problem to most researchers. One sets out to try to separate a single variable from the unintelligible mess in which it is embedded—and it just keeps getting lost in the mess. This is so prevalent a challenge in science that it is known as the confounding of variables—and to let things remain so confounded is a methodological sin.

After bumping against this problem for some time, the obvious finally sunk in on me. One of these confounding variables was moral sensitivity. And when I came to re-examine my data and my thinking from this new perspective, I saw that what seemed at first to be an unintelligible mess was actually a strikingly intelligible system. By taking a close look at moral sensitivity and futures sensitivity along with the other confounding variables, I saw what I now call the guidance system of higher mind.

I saw that within the frontal lobes—or in some way heavily dependent on frontal lobe capacities—are six sub-systems which cooperate to form this guidance system of higher mind. If we think of the brain in terms of the flow of information—or in terms of the input-output, information processing model—the sequence is as shown in Figure 1: The Guidance System of Higher Mind.

If we closely examine a sample incident from beginning to end, we may see how this cooperative guidance system operates. Let us say something happens that alerts our brain and mind to the need for identification and consideration by the brain. It could be anything from reading the newspaper to hearing a shot in the night and a knock on our door.

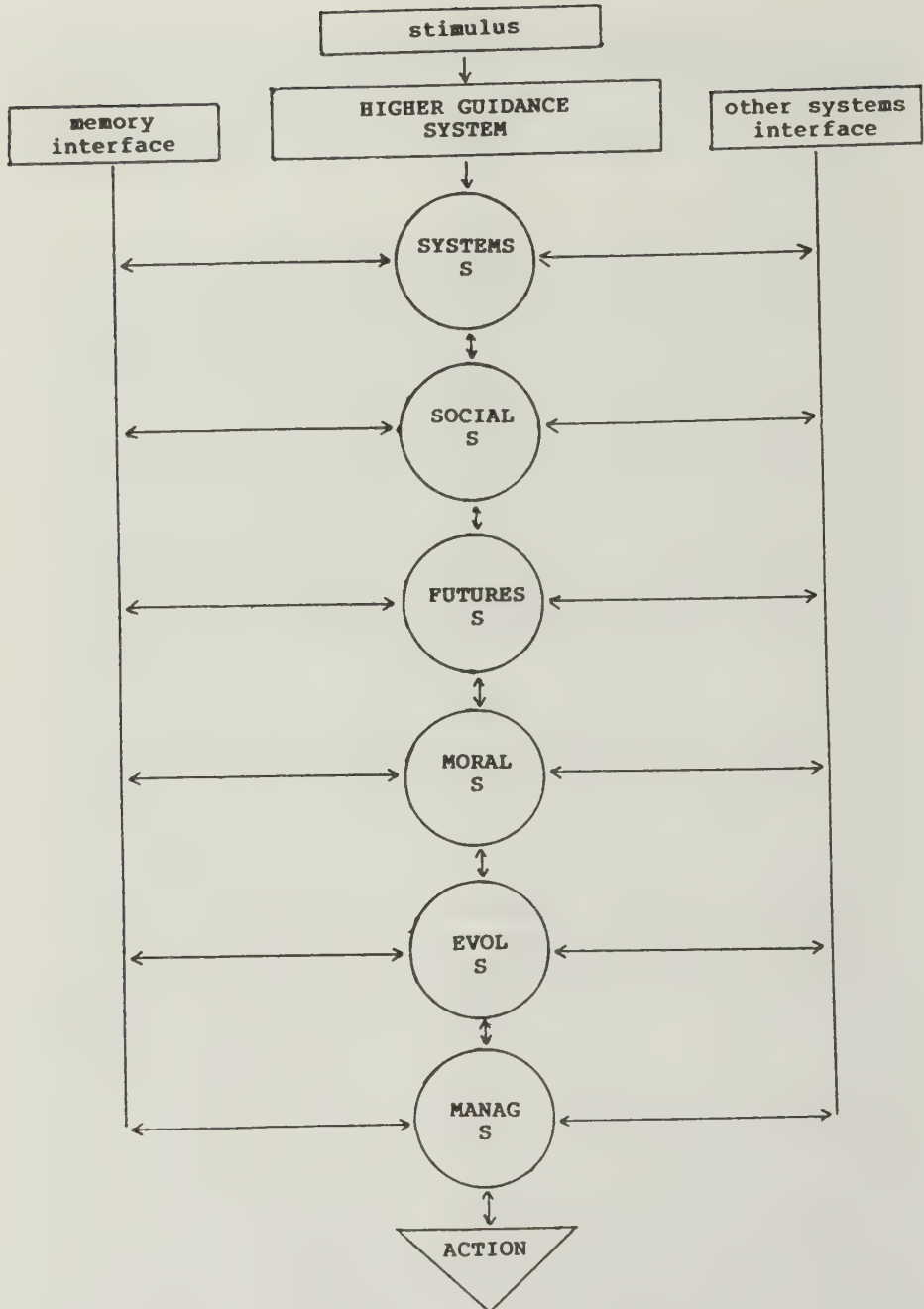


Figure 1. The Guidance System of Higher Mind.

This information is first processed by capacities comprising our systems sensitivity. This is our reading of whatever it may be in terms of orientation to space and time and known objects and relationships within space and time.

Next, this information is processed by our social sensitivity. This phase labels the phenomena in terms of our assessment of its probable meaning for our relations to other people—significant others, people to fear, people to love, people to ignore. Most notably, brain research makes it quite evident this assessment is not primarily cognitive. In such terms, it is primarily precognitive and affective. In other words, primarily via right brain half processing, the readings of emotion, and of a mysterious information-gathering capacity we do not yet understand, come first. Then out of such readings rises the cognitive reading, heavily shaped by left brain analysis.

By means of these first two sensitivities we answer the question “what is it?” We establish this sense of the thing itself—or what basically exists, what is.

Next in processing sequence is our futures sensitivity. By means of the imaging capacity of our brain and mind we project the possible consequences of whatever this is. We project alternative scenarios for feeling, thought and action. We answer the question of what can be.

Next comes the phase that is of increasing importance to us at this critical juncture in human evolution, the assessment of moral sensitivity. On the basis of both our experience and, I am increasingly convinced, of inbuilt standards and selection principles—which experience may either evoke and strengthen or vitiate and nullify—we identify whether whatever-it-is is good or bad for us and for others. In other words, out of the array of possibilities—the “what can be’s,” the alternative futures that futures sensitivity presents us—now we narrow the focus to answer the key question of what should be.

Next comes the fascinating sub-system that emerges when one lays out the others in flow chart form. You see the flow of these sub-systems—and then you see how they are interlinked through a multiple set of feedback and feedforward connections. I saw then that another processing stage must be posited, one which provides a re-reading of all these sub-systems prior to the decision-making or managerial phase: a systems sensitivity that, most importantly, provides a holistic reading of the meaning of movement through time—this movement being variously perceived in the dynamics of dialectical, developmental, or evolutionary relationships. This is why, for this sub-system, a suitably descriptive name would be dialectical-developmental-evolutionary sensitivity. As this is cumbersome, I am calling this stage either dialectical, or developmental, or evolutionary sensitivity, depending on context.

Last in this information-processing sequence is the decision-making and action-initiating capacity. As brain research from the great Hughlings Jackson forward has shown, this managerial capacity for brain and mind is also heavily dependent on frontal lobe brain functioning.¹⁵ After taking into consideration the conclusions of all previous information-processing phases, this sensitivity achieves the synthesis, the compromise, which underlies both decision-making and the initiating of action. For these reasons, I call it managerial sensitivity. It answers the question of what should I do—or what should I not do.

Now this model has a number of implications, four of which fairly directly bear on the question of the relation of cooperation to moral sensitivity. The first is that throughout both the evolutionary development and the contemporary operation of this guidance system of higher mind, at every turn we encounter cooperation as a basic ingredient or governing principle. We find cooperation of the cells in the buildup of the brain eventuating in the frontal lobes. We find cooperation in the operation of brain areas in the guidance system one can identify at this highest level of the brain. And we find cooperation in the feedback/feedforward model that emerges—as will shortly be shown—if we abstract and build a useful model of what is going on here in familiar systems scientific terms.

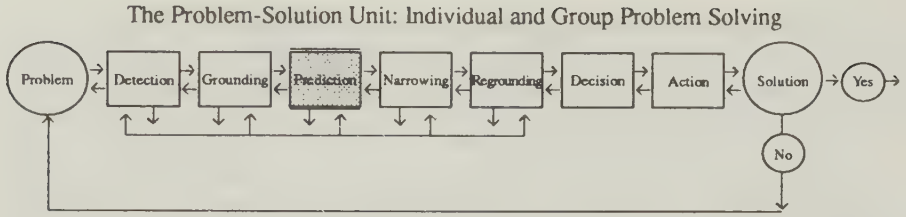
A second implication is the matter of this being the guidance system of higher mind. All systems, of course, involve input and output. If we look at everything that flows to this frontal lobe based system through our sensory equipment, and through lower levels of the brain, as input; and if we look at everything that then flows out from the frontal brain through its closely aligned motor areas as output; then it seems evident that this is—or is some reasonable approximation of—the guidance system of the brain, therefore the guidance system of higher mind.

A third implication is that it seems further evident that this guidance system will, beyond the individual, be reflected in the guidance systems of groups and of society as a whole. Figure 2, which re-presents this model in the form of a basic unit for problem-solving, extends the model level by level outward from cooperativity in the individual, into cooperativity in groups, to cooperativity in our global “family” in its often desperate search for peace and fulfillment.

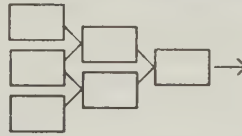
Though the labels are different, the guidance factors are the same. Here I show systems, social, futures, moral, dialectical, and managerial sensitivity in their functions: as responsible for detection, grounding, prediction, narrowing (of options), regrouping, and decision and action.

Fourth—and this is by far the most important implication—through this model we see moral sensitivity not as something apart from, or mechanically added to, the old Cartesian model of the mechanical man we all still carry within us, no matter how much we see ourselves as being liberated from it. We see moral sensitivity not as something isolated from or compartmentalized within our life system as a whole—not something just for two hours on Sunday, or for politicians to pay lip service to, or for theologians to talk to death; not as something to be set on a pedestal and ignored. We see it as Immanuel Kant did—but without the 180 years of intervening science necessary to deny his vision, but then to reach again the same basic conclusion.¹⁶ We may see it now as a very special capacity built into the structure of our genetic potential, our brains, our minds, into our lives—and indeed, into the intimate and indeed routine information processing for practically every moment of our lives.

That, as I see it, is the clear implication of the way moral sensitivity is imbedded within systems, social, futures, evolutionary and managerial sensitivity in this cooperativity model. This new perspective is based not only on the pioneering brain research of Alexander Luria, but also on the frontal lobe research of Karl Pribram¹⁷, Walle Nauta¹⁸, Ward Halstead¹⁹, Walter Freeman²⁰, Paul MacLean²¹, and many other leading brain researchers extending back over 100 years.



Problem-Solution Structure I: Individual, Group, and Organizational Conscious Evolution



Problem-Solution Structure II: Human and Global Conscious Evolution

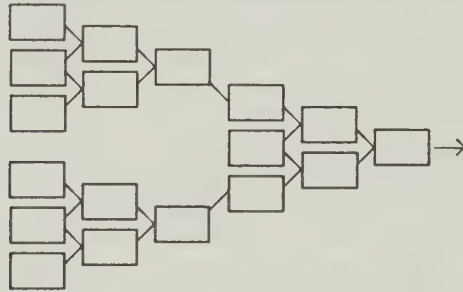


Figure 2. Conscious Evolution: A Feedforward/Feedback Model.

COOPERATION AND THE CULTURAL EVOLUTION OF MORAL SENSITIVITY

Going now from biological evolution to cultural evolution, we embark on the track that has led to much confusion. In other words, we can look at the brain. We can look at what we know of biology. We can look at how this model I've developed seems to be reflected in human affairs. And from this, we may conclude this could be a reasonably good model of the guidance system of higher mind—but only as an abstraction of our potential. The model seems to reflect the basic neurological equipment that had evolved in humans by possibly one million years ago. But the question now is how have we been taught by our cultural experience to use this wondrous equipment?

How is this model—or better stated, the neurological system which it represents—actually particularized? How has it been made operational through our cultural evolution over thousands of years? And in what forms is it expressed today, through differences in people, in groups, and in nations?

Again, we find the weaving and reweaving of cooperation at every turn—but now as very much uphill going much of the way. Traditionally, the data on cultural evolution has been gathered by archeologists, mythologists, linguists, historians,

anthropologists, and sociologists for interpretation by themselves or by other social analysts. This has led to a bewildering variety of opinions as to what constitutes moral sensitivity, and the hope or lack of hope for moral sensitivity to have any effect in human affairs.

To cut through this confusion, I have found two extremely useful sources of both data gathering and interpretation. One is the cultural evolutionary systems analysis of another member of the General Evolution Group, Riane Eisler.²² The other useful source is the striking new works of archeology that Eisler draws on—the work, for example, of archeologists Marija Gimbutas in Old Europe, James Mellaart in the Middle East, and Nicholas Platon in Greece.²³ Here, from the viewpoint of an exploration of moral sensitivity, is the picture of our cultural evolution that emerges from these—as well as, by now, scores of other—sources.

In Europe, for example, it is still commonly supposed that prior to the conquest of the Romans there existed only the most backward and savage of people. The Romans, it is assumed, not only brought civilization but—in comparison to the Goths or Visigoths, let us say—something that must have represented an advance in moral sensitivity for its time. The facts, it now appears, could not be more radically otherwise. Moreover, the difference I will describe also seems to be the picture more generally—in the Middle East, in ancient Greece, even, we are discovering, in India, elsewhere in Asia, and in the Americas.²⁴

Despite long-entrenched resistance, Gimbutas and some of her co-workers in Indo-European studies have begun to establish this very different picture of the past. They have found that over at least a 4700 year span—from approximately 6500 to 2800 B.C.—there existed in Europe a remarkably advanced, widespread and cohesive culture that was, in key regards, a polar opposite both to what came later, and to what we know today. For this culture of old Europe was not only highly creative, with striking art works and—contrary to the impression give us by traditional scholarship—a pre-alphabetic language of its own. It also displayed a remarkably high degree of moral sensitivity by both subtle criteria, which I develop elsewhere, and by criteria which by now seem obvious to a majority of those fortunate enough to be both concerned and sufficiently well informed about the present state of humanity.

There is by now fairly general agreement, as Immanuel Kant articulated in his time and increasing thousands are in ours, that the violence and continual warfare that wracks our world—and in the atomic age, now threatens our very existence as a species—is a profoundly immoral phenomena. There is also much agreement that the devastation of the environment that provides us and all other living creatures with the wherewithal for life is also profoundly immoral. Many can also agree that there is profound immorality in the extreme inequalities between humans, between nations, and between regions of this world. Similarly, many can agree on the immorality of the dynamics of exploitation that feeds on these vast inequalities.

Now the evidence mounts that in this earlier culture, over a span of thousands of years, there was a pattern of peacefulness that today is almost impossible to believe. Archeologists digging at this level, for example, find a startling lack of fortifications. They also find a lack of artifacts depicting the kind of violence that becomes standard in the art of later times.

As for the valuing of our environment, in thousands of figurines and other artifacts there is massive evidence of an ecologically-oriented Goddess worshipping religion in this earlier time in which a systems-integral valuing of the environment was culturally so inbuilt, so automatic, so compelling, as to again be almost beyond our understanding.

As for the equality-inequality criteria, elsewhere I detail many indicators of a lack of the class and power extremes that came later,²⁵ but one in particular is worth pondering in the context of an interest in the operation and fruits of cooperation. One of the most distressing problems of our time is that of vast economic inequalities: this problem of the misery of a majority of the people of this earth, while only a minority of us may enjoy the so-called good life.

Yet back there in this earlier culture most vividly exemplified by Minoan Crete, there was established an ethos of cooperation in which the wealth of a surprisingly advanced economy of general abundance was generally shared by all. These were not—as those entrenched in outdated information would be tempted to believe—tiny groups of gentle savages sharing minimal goods because there was nothing around to fire up their greed or ambition. These were hundreds of thousands of people already conducting trade all over the Mediterranean, who possessed gold jewelry and fine clothes, and in Crete even comfortable town houses and apartments in large apartment complexes. And these apartments and town houses were in towns (e.g., Knossos, Phaistos, Zakros) laid out with such a profound feeling for the quality of life that such architectural intelligence was not to be seen again until our own time.²⁶

This was the world most notably built and held together by cooperation that Eisler, drawing on Gimbutas' work in Old Europe, Mellaart's work in Catal Huyuk, Platon's excavations at Knossos and Phaistos, and many other sources, identifies as the earlier gylanic or partnership model culture. This is the more peaceful and joyful world that over approximately 1600 years was radically transformed into the cultural core for the more violent and miserable world we have today in which cooperation is such an uphill struggle.

What is interesting to some of us involved with nonequilibrium and chaos theories is that this transformation from what Eisler calls a partnership culture to a dominator culture precisely follows the dynamics isolated by Prigogine in chemical solutions or by Edward Lorenz in weather formations.²⁷ This early culture was in a steady state over an amazingly long time. Then suddenly there appears the "strange attractor" of Lorenz—which is also quite literally a "peripheral invader" in the sense articulated by Eldridge and Gould.²⁸

Along the periphery of this settled, agricultural-based people living in the fertile areas was this other world—of nomads roaming with their herds, living in colder or hotter, more inhospitable areas. Out there beyond these people enjoying an economy of abundance and open-handed cooperation were these people driven by a contrasting economy of scarcity and fierce competition. And the people of this other world were so different as to almost seem another species: for, above all, they valued inequality, they valued exploitation and despoilation, and they valued war.²⁹

In mathematical dynamics, as Ralph Abraham vividly demonstrates, we see the strange attractor appear in a system; then disappear; then suddenly, seemingly out

of nowhere, in an amazingly swift time—as storms emerge in weather systems, or as unexpected reactions cloud or clear a chemical solution—the strange attractor may become the primary attractor, now with new control over the whole of the system which it has transformed.³⁰

In precisely this way, in three great waves of invasion, out of what are now the steppes of Russia, there swept into Europe the people Gimbutas calls the Kurgans. They were the leading edge of a more general incursion of the people who for more than 100 years have been identified as the Aryans and the Indo-Europeans.

Through slaughter, rape and pillaging they seized control. Then, to maintain control, they did two very effective things. First they systematically destroyed as much of the physical evidence of this earlier time as possible. Then they reshaped the art to celebrate violence. Then hordes of priests—and later, secular scholars, generation after generation—rewrote history so that it might seem to begin with these invaders. By this means—predating the methods of Big Brother in Orwell's *1984* by thousands of years—there was established upon this victimized earth the peculiar cultural system that is still ours today.

It is a truly incredible story that, for many, is simply impossible to accept the first few times they hear it. The evidence is there. It has been repeatedly revealed by scores of scholars only to be again and again diverted and glossed over. The basic psychological problem seems to be that it requires us to shed our last protective illusions as to the nature of the cultural system that is our home. For bit by bit as one absorbs this new information one comes to see—as not only these unwelcome scientists but also our greatest philosophers, poets, playwrights and novelists have tried to tell us—that ours is a truly unnatural, horribly unbalanced, and indeed psychically and socially schizophrenic system.

For example, on one level of the strange, split-level mind and mindset of our culture, we find this moral system that ostensibly values equality, economic fairness, cooperativeness, and peace. Such are the noble goals put forth in thousands of speeches by political leaders and in the prayers of religious leaders. But actually, operationally, in everyday fact—as so many of us have not only long observed, but often deplored—our system not only values, but it will fight to the death to keep in place inequality, exploitation, conflict, and war.

A CHOICE OF FUTURES

As I am extensively developing in works in progress, what emerges from this revised understanding of our cultural evolution is a picture *not* of the one world we assume. Rather, one gradually comes to see that shaping everything in our lives, including moral sensitivity, are two very different basic worlds—or, depending on discipline and orientation, two paradigms, models, attractors.

Deriving from the earlier culture is what Eisler terms the gylanic or partnership model, which stresses equality, nonviolence, and the power of our linking with others. Deriving from the violent culture which transformed—but never wholly displaced—the earlier culture is what Eisler terms the androcratic or dominator model, which stresses inequality, control through violence or the threat of violence,

and power as ranking over others. On the level of moral systems I find the difference—which I've extensively analyzed in terms of brain functioning and general systems theory—reflected in a “partnership moral sensitivity,” as prototypically expounded by Jesus, and a “dominator moral sensitivity,” as prototypically expounded by Nietzsche.³¹

What we have then on all levels is a most confusing mixture of the two, where what one says tends to be guided by one model, but what one does—and particularly at the national leadership level—tends to be guided by the other. We have this situation of a growing mass of people not only extolling but increasingly desperate for cooperation and the fruits of cooperation. But we also have those among us who through the long cultural entrenchment of the Dominator model are motivated—and unfortunately still greatly empowered—to do everything possible to undermine and negate cooperation and deny most people its fruits.

To summarize: Following the track of biological evolution, by the time we have developed over nine months in our mother's womb, and have been born into this earth, we have the basic neurological equipment for cooperation and moral sensitivity that I have outlined—this model for a guidance system for higher mind. Because of its grounding in basic research into the operation of the frontal lobes as well as related lower brain areas and levels, I believe this model, or some approximation of it, will eventually come to be accepted without too much difficulty.

We further, however, have this troubling picture of how this basic equipment we are born with is operationalized in the directions I have indicated. On one hand, there is this primary thrust established in prehistory, which still struggles for an effective voice in our world: this direction toward an ethos valuing equality, respect for the environment, cooperativity, and peace. On the other hand, there is this later aberration, also established in prehistory, which is still the ruling direction: toward an ethos valuing inequality, exploitation, conflict, and war.

The most important implication of this new biological/cultural perspective on cooperation and moral sensitivity is this. Prior to modern brain research, modern archeology, and modern feminist scholarship, we could be caught like automatons within the system as it presently exists. But given this new knowledge, we have now been given a new clarity and level of choice.

Out of the present confusing hybrid of dominator and partnership moral sensitivities, we are now empowered by the growth of knowledge to choose one morality over the other. We can further make this choice knowing that this is not merely a matter of individual whim in a world that will go on pretty much the same as it is, whatever we do. We can make this choice knowing that if we don't make the choice we are not likely to survive as a species. But also, we can make this choice knowing that a rare and precious window of opportunity has been opened up for us here in time.

At least, for a while, the dynamics are with us. We can, in effect, choose to ride with the new “strange attractor” of a very old morality and a biologically inbuilt cooperativity that has become newly meaningful. And this attractor—to which each of us may contribute a small but cumulatively vital portion of force—may then help guide a vast systems shift into the much, much better future world we all so greatly desire.

Notes

1. In various books, I am presently writing of a progression for the development of a science of morality one can trace through the work of Kant, Marx and Engels, Spencer, Durkheim, Freud, Piaget, Fromm, Kohlberg and Gilligan.
2. Darwin, C. 1952. *The Descent of Man*. Chicago: The University of Chicago Press.
3. Kropotkin, P. 1950. *Mutual Aid*. Boston: Porter Sergent.
4. Maturana, H., and Varela, F. 1987. *The Tree of Knowledge*. Boston: Shambhala.
5. Csanyi, V. 1989. *Evolutionary Systems and Society*. Durham, N.C.: Duke University Press.
6. See note 4.
7. Laszlo, E. *The Intelligent Universe*. Work in progress.
8. Banathy, B. 1987. "The Characteristics and Acquisition of Evolutionary Competence." *World Futures: The Journal of General Evolution*, 23, pp. 123–144.
9. Chaisson, E. 1981. *Cosmic Dawn*, Boston: Atlantic-Little Brown; 1987. *The Life Era*, New York: Norton.
10. Augros, R., and Stanciu, G. 1989. *The New Biology*. Shambhala New Science Library.
11. Loye, D. *Moral Sensitivity: An Action Theory for an Endangered Species and an Endangered Planet*. Work in progress.
12. See David Loye. 1984. *The Sphinx and the Rainbow: Brain, Mind and Future Vision*. New York: Shambhala New Science Library, 1983; Bantam; and Paul MacLean. 1973. *A Triune Concept of the Brain and Behaviour*. Toronto: University of Toronto Press. Though popular and frequently cited by non-neurologists and neuropsychologists, MacLean's triune brain concept is frowned on by many experts in this area. I cite it mainly because no other generally known work has adequately captured the nature of the developmental sequence that is clearly there and MacLean provides an anchoring imagery.
13. Loye, D. 1978. *The Knowable Future: A Psychology of Forecasting and Prophecy*, Wiley. *The Sphinx and the Rainbow*; and *The Psychology of Prediction: Toward a New Science for the Sciences* (work in progress).
14. Luria, A. 1973. *The Working Brain*. New York: Basic Books.
15. Pribram, K. 1973. "The Primate Frontal Cortex—Executive of the Brain." In Pribram, K., *Psychophysiology of the Frontal Lobes*. New York: Academic Press.
16. As I will bring out in *The Glacier and the Flame* (work in progress), Jean Piaget's work makes this completion of the circle evident.
17. See note 15.
18. Nauta, W. 1971. "The problem of the frontal lobe: A reinterpretation." *Journal of Psychiatric Research* 8:167–86.
19. Halstead, W. 1949. *Brains and Intelligence: A Quantitative Study of the Frontal Lobes*. Chicago: University of Chicago Press.
20. Freeman, W. 1942. *Psychosurgery: Intelligence, Emotion and Social Behavior following Prefrontal Lobotomy for Mental Disorders*. Springfield, Ill: C. C. Thomas.
21. See note 12.
22. Eisler, R. 1987. *The Chalice and the Blade: Our History, Our Future*. San Francisco: Harper & Row.
23. See Marija Gimbutas, "The First Wave of Eurasian Steppe Pastoralists into Copper Age Europe," *Journal of Indo-European Studies* 5 (Winter 1977): 277; James Mellaart, *Catal Huyuk*, New York: McGraw-Hill, 1967; and Nicolas Platon, *Crete*, Geneva: Nagel, 1966.
24. For the long hidden or suppressed data on the shift to a Dominator culture in ancient India and Pakistan, see Bridget and Raymond Allchin. 1982. *The Rise of Civilization in India and Pakistan*. London: Cambridge University Press; George Feuerstein. 1974. *The Essence of Yoga: A Contribution to the Psychohistory of Indian Civilization*. London: Rider. For the shift throughout the Middle East and as far east as China, see J. P. Mallory. 1989. *In Search of the Indo-Europeans*. London: Thames and Hudson. For the shift in the Middle East, North Africa and Central America, see James DeMeo, "The Origins and Diffusion of Patrism in Saharasia: Evidence for a Worldwide, Climate-Linked Geographical Pattern in Human Behavior." *World Futures: The Journal of General Evolution*, in press.
25. In works in progress *The Glacier and the Flame* and *The River and the Star*.

26. Platon's *Crete* (Geneva: Nagel, 1966) provides a sense of this but no book I know of adequately brings this out. One must go to Crete and, in the ruins of Knossos and Phaistos, see the evidence for oneself.
27. See Ilya Prigogine and Isabelle Sengers. 1984. *Order Out of Chaos*, New York: Bantam; and Edward Lorenz. 1984. "Irregularity: A Fundamental Property of the Atmosphere." *Tellus* 36A, 98–110.
28. See Niles Eldridge and Stephen J. Gould. 1972. "Punctuated equilibria: An alternative to phyletic gradualism." In *Models in Paleobiology*, Peter Schopf (Ed.), San Francisco: Freeman, Cooper.
29. The portrait is most vivid and complete in recent sources such as Gimbutas and Eisler (see notes 22 and 23); however, the nature of this difference has been accurately perceived for much of this century by various scholars, e.g., H. G. Wells in *The Outline of History* and V. Gordon Childe, 1958, in *The Dawn of European Civilization*. New York: Knopf.
30. See Ralph Abraham and Christopher Shaw. 1983. *Dynamics. Part II: Chaotic Behavior*. Santa Cruz, Calif: Aerial Press.
31. Nietzsche, F. 1966. *Beyond Good and Evil*. New York: Vintage.

CHAPTER 4

Jean Gebser and the Spirit of Cooperation

ALLAN COMBS

Epochs of great confusion and general uncertainty in a given world contain the slumbering, not-yet-manifest seeds of clarity and certainty. The manifestations of the aperspectival world . . . show that these seeds are already pressing toward realization. This means that we are approaching the “zenith” of confusion and are thus nearing the necessary breakthrough.

Jean Gebser, 1953
*The Ever-Present Origin*¹

Experience teaches that it is not disarmament that points the way to peace, but rather that peaceful relations open the door to disarmament. Peace is the consequence of practical cooperation.

Richard von Weizsäcker²
President of West Germany

It is evident that the continued success of the human species into the opening decades of the twenty-first century will require a spirit of cooperation. This means a spirit of working together between individuals, a spirit of working together between political units such as nation states and international collectives, and a spirit of working together between the human and the many other species with which it shares the Earth.

Gebser's evolutionary model of consciousness³ provides a uniquely valuable framework from which to examine the topic of cooperation. The very meaning of cooperation as well as its forms of expression change with each successive evolutionary structure of consciousness. The potentials, qualities, and limits of cooperation thus depend on the structures of consciousness from which it is born. These potentials, qualities, and limits form the subject of the present discussion.

Cooperation is a topic that is more than tangential to human survival in the decades to come. As suggested in the second opening quotation above, it is at the heart of the process of reconciliation and peacemaking among otherwise ambivalent or even hostile factions. Based on extensive behavioral investigations of four species of nonhuman primates (chimpanzees, rhesus monkeys, stump-tailed monkeys, and bonobos) as well as careful observations of human behavior, Frans de Wall⁴ suggests that the failure of cooperation in the form of conflict is a natural part of life among primates. He also suggests, however, that reconciliation is just as natural, and as much a part of the primate constitution as is conflict. He finds that what leads to reconciliation is not the absence of strife but the presence of a valuable relationship, whether this relationship is between individuals or between nation states. Many friendships, for instance, are fraught with conflict, but both parties

continue to reconcile their differences as long as the relationship continues to meet their intellectual, emotional, economic, or political needs. What this means in plain English is that both parties are involved in a mutually beneficial interaction.

It is apparent from even a tertiary survey of modern biological literature that cooperation is almost as widespread as life itself.⁵ Even at the level of single cell organisms cooperation in the form of symbiosis is commonplace if not, in fact, the rule.⁶ The meaning as well as the mechanics of cooperation are modulated, however, by the complexity of the particular organisms involved. With the evolutionary advent of large brains, behavior becomes more flexible and dynamic. Intelligence allows for increasingly higher order interactions in which separate organisms join together in elaborate behavioral exchanges. At the human level, such exchanges create higher order systems such as families, communities, cities, nations, economic networks, and so on.⁷

Within the full spectrum of human activity there are many forms of cooperative exchange. One way to understand these is to examine the major structures of human experience and their implications for cooperation. In Gebser's terms this means to explore the worlds of human reality implicit in the principal structures of consciousness, each with its own implications for cooperation as well as for hostility and aggression. The following pages will undertake this examination.

THE STRUCTURES OF CONSCIOUSNESS

The Archaic Structure

On a historical scale, this structure is essentially prehuman. It is a form of consciousness which, though it knows it not, experiences a primal unity with the light of the *origin* itself. According to Gebser, this structure is the historical analog of the mythological state of purity at the beginning of history, life in the Garden of Eden before the fall. It represents a time when our hominid ancestors were entirely at home in the world of nature.

Since there are no detailed records of life in this epoch, perhaps the best appraisal of it is obtained from observing the natural state of nonhuman primates. These tend to live in relatively small groups within which complex patterns of social interaction are commonplace, including cooperative behavior exhibited, for example, in defense of the group, foraging for food, and establishing social hierarchies.⁸

Aggression is not uncommon within and between such groups, but it is often followed by reconciliatory efforts, so that there seems to be a natural counterpoint among primates between conflict and peacemaking.⁹ Waal concludes that this counterpoint is probably characteristic of most if not all primates, including humans, and probably has genetic roots that extend back at least thirty million years to a time before the modern primates, including humans, divided from a common ancestor. Interestingly, nonhuman primates, like their human relatives, may bear grudges for considerable periods of time, but tend not to exhibit them while cooperation dominates social interaction.¹⁰ Welker, for example, comments on the capucine monkey's "ability to suppress enmities, and its inability to forget them."¹¹

When fighting breaks out among nonhuman primates it is in response to present

causes such as territorial pressures or imbalances in the social structure within the group,¹² and does not escalate into sustained conflicts such as are typical in human society. As was suggested above, we might well suspect that life was similar among archaic humankind as that described above for nonhuman primates.

The Magic Structure

We have no pure example of a solitary structure of consciousness in the human being because, like functional systems of the human brain, each new one as it emerges forms a governing system over the older ones, which in turn continue to function at their own level. From the perspective of the modern human, Gebser's structures are, in fact, *ontogenic* rather than *phyletic*, that is, each forms part of the deep structure of the modern psyche.

Historically, as each new structure emerges it becomes dominant over the older ones, until it itself becomes secondary to another emergent structure. We may look for examples of dominantly magical consciousness, for example, in Native American or Australian Aboriginal cultures, but such cultural outlanders of the modern world, while exhibiting a greater awareness of magical possibilities than is characteristic of industrialized cultures, are still products of unique and long evolutionary histories in which the mythic and mental structures have had more than enough time to develop in their own right. Gebser himself was quick to point out the inappropriateness of directly equating, for example, ancient Europeans with modern tribal peoples.¹³ Still, it is the opinion of the present writer that something is to be learned from such comparisons if they are made cautiously and in the context of the available archeological records of our own history.

Gebser noted that the dominant magic structure of consciousness expressed a tribal or group identity rather than the personal or individual one characteristic of the mental and especially perspectival consciousness. This suggests that cooperation in the dominantly magical human was a matter of immersion in the ethos of the group or tribe. Strong relationships between individuals may well have existed (pair-bonding is not unknown even among nonhuman primates) but this would have been secondary to psychological absorption in the collective.

Magical consciousness, however, also implies a first awakening to a sense of separation from nature, and thus the beginning of the drive for power and control. Cultures dominated by this structure would seem capable of power-motivated conflict within and especially between tribal or collective units. If such conflict arose, it seems more than likely that magic played some role in it, possibly in the form of spell casting or witchcraft. Large scale and sustained aggression, however, would appear unlikely in the absence of a developed mental structure to organize and sustain it over long periods of time.

The Mythic Structure

The mythic consciousness is characterized by story telling. In it the imagination is projected outward as imagery, then transformed into narrative. Imagination ex-

pressed through myth, in Gebser's words, "renders the soul visible so that it may be visualized, represented, heard, and made audible."¹⁴ This brings into the spotlight the vastly important process of language.

While Gebser tended to focus on the centrality of the imagination in his discussions of the mythic structure of consciousness, the advent of articulate language no doubt played an important historical role in the appearance of the great societies of the mythic epoch, all of which relied heavily on social cooperation. These included the neolithic society of Old Europe,¹⁵ as well as the ancient civilizations of Mesopotamia, Egypt, Greece, Crete, the Indus Valley, and the Yellow River in China.

Cerebral asymmetries in the skull casts of *Homo habilis* suggest that the beginnings of human language may date as far back as four million years.¹⁶ The elaboration of language into an exquisite and powerful vehicle of social control and coherence probably did not come about, however, until much later. This may well have occurred as recently as a period from about fifty thousand to perhaps ten thousand years ago.¹⁷ This corresponds roughly to the development of the mythic imagination. It includes the flourishing of the imagination expressed in the paintings found in the great cave sanctuaries of southern Europe,¹⁸ as well as the spread of the widely held mythology of the goddess beginning at about 20,000 to 18,000 B.C.¹⁹

The full sweep of the mythic imagination, however, did not break free of the older structures and come into its own until the advent of neolithic agriculture sometime around 8,000 to 9,000 B.C. During the next few millennia the entire Old European civilization based on farming developed in regions now largely in Eastern Europe and the Near East, bringing with it artistry, commerce, copper metallurgy, and even what appears to be a rudimentary script.²⁰

Historically, the pouring forth of rich visual imagery characteristic of the mythic structure of consciousness was the internal combustion engine behind the rapid acceleration of technology that was so characteristic of the first millennia of the neolithic era. *Homo erectus* had lived for over one million years making no technological statement beyond a few modestly well crafted stone tools. Later the Neanderthal spent half a million years developing what appears to be a moderately rich culture, but one still lacking in rich aesthetic and technological expression as judged against modern standards. With the Cro-Magnon these aspects of culture began to gain speed, and with the advent of full-blown mythic consciousness artistic and technological development accelerated exponentially. Feuerstein points out that this enormous creative energy needs to be made explicit because Gebser, in his own works, tends to stress the introverted aspect of mythic consciousness.²¹

One might suspect that societies dominated by the mythic structure of consciousness, like those earlier ones dominated by the magic structure, would, without the direction that the mental structure can provide, be subject to no more than occasional conflicts of the type observed in nonhuman primates. This would indeed seem to be the case for the Old European civilization, for which virtually no evidence of violent conflict has yet been found.²² If we look, however, at the more recent, but still ancient civilizations, for instance of Mesopotamia, Greece, and China we find quite a different picture. It would seem, in fact, that war as we know it

today was virtually invented in Sumer around the third millennium B.C. A chronicle of that period reads:

Sargon, King of Agade . . . the city of Uruk he smote and its wall he destroyed. With the people of Uruk he battled and he routed them. With Lugal-zaggisi, King of Uruk, he battled and he captured him and in fetters he led him through the gate of Enlil. Sargon of Agade battled with the man of Ur and vanquished him; his city he smote and its wall he destroyed. E-Ninmar he smote and its wall he destroyed, and its entire territory, from Lagash to the sea, he smote. And he washed his weapons in the sea . . . ²³

What could motivate such destruction? The chronicle itself seems to swagger with the answer. No matter what social or economic reasons might be offered, part of the answer would seem to be the appearance of rulers such as Sargon who were intoxicated with egotism. Thus, while we are viewing a historical epoch that is, for the most part, still characterized by domination of the mythic structure of consciousness, the mental structure, and even the ego has surfaced with a vengeance.

If there is any doubt about the appearance of the ego in ancient Mesopotamia, it is put to rest by a reading of the epic of Gilgamesh. Here we find the ancient hero blatantly parading his masculine ego to the express humiliation of the representatives of the ancient tradition of the goddess,²⁴ and in the end voicing his frustrations with the limitations of human life in a thoroughly self-consciousness manner that carries a distinctly existential flavor.

In the ancient campaigns of king Sargon we have the oldest known record of the emergence of an equation that will occur again and again throughout the history of warfare and conflict. The mythic structure alone would most likely be incapable of sustained and systematic conflict of the kind we see in the campaigns of king Sargon. It would be more likely to engage in more or less sporadic flourishes of fighting, and these with an emphasis on heroic actions of individual warriors. It is what we find in many tribal peoples such as the Native Americans, and it is the style of fighting depicted by Homer in the *Iliad*. What we see in Sargon, however, is the play of the ego as a modulating influence on the tendency of the mythic consciousness to create great issues, that is, to polarize differences in perspective and magnify them into "mythic proportions." In Sargon's case, and many to follow him, this is accompanied by an inflation of the ego to the point that it sees itself as vastly larger than life. Sargon was a megalomaniac.

This mixture of the mental and the mythical structures, by which the mental makes distinctions—"I am important and you are not," "capitalism is good, communism is bad," "Christianity is right, Islam is wrong," etc.—and the mythic polarizes them into gigantic proportions, can readily ignite into uncontrolled hostility and war. The enemy may then be projected as a demonic *other*, deserving of less than human consideration. Combine this with the still extant tendency of the magical structure to be drawn into collective social movements such as the Nazi party or the Moral Majority and we have the full prescription for relentless and heartless aggression. All this is to say that already in the third millennium B.C. we see the basic pattern for war even as it comes to us today, involving a unique interaction of the magic, mythic, and mental structures of consciousness.

The Mental Structure

This structure became the dominant way of incorporating reality during the final centuries before the birth of Christ, and remains dominant today. As Gebser points out, it first reached full expression in classical antiquity when Parmenides, in 480 B.C., could say *to gar auto noein estin to kai einai*, "For thinking and being is one and the same."²⁵ Plato, in the *Phaedo*, attributes a similar attitude to Socrates, who seems to equate the soul and the afterlife with pure thought. The identification of being with thinking would be expressed again in modern times by René Descartes.

Feuerstein²⁶ estimates that the roots of the mental structure of consciousness may actually go back many millennia before Christ and, as noted above, there is reason to postulate the emergence of the ego in certain individuals well before Greek classical antiquity. As with the other structures of consciousness, however, there is an *efficient* and a *deficient* form of mental consciousness. The efficient form is represented by directive, discursive thought, as seen, for instance, in the dialogues of Plato. One suspects that such discursive thought carried the potential for the first time of cooperative interactions between relatively large numbers of individuals, interactions based on a mutual exchange of ideas. Indeed, this is precisely what we find in classical Athenian democracy.

The democracy of Athens was no less than an experiment in governance by intellectual discourse. The fact that it lasted for only a brief period of time does not take away from this fact, nor form its greatness. The reasons for its failure are complex, but clearly involved a loss of mental balance in favor of the greed and heady egotism that led the Athenians of the late fifth century into the disastrous naval campaign against Syracuse. It seems that, tragically, while the new democracy was able to triumph over the deep collective tendencies of magical consciousness and the larger-than-life polarities of mythic consciousness, it was unable to stand against the catalytic power of the emergent egoic structure.

The possibilities for thoughtful cooperation and governance offered by the mental structure were not unique to Greece. For example, the Roman Empire, despite its many political turmoils and its final decadence, gave the world its first great system of international government. This was founded upon an effective system of reasonably equatable international law that was unprecedented in history.

The deficient form of the mental structure is perspectival consciousness, associated with an ego focally located in the head. This perspectival posture did not move into the foreground of consciousness until the mid sixteenth century A.D. and the Italian Renaissance, but as noted above, its roots go back well into the ancient world. Perspectival consciousness is associated with rational thought, or *ratio*, characterized by divisive, immoderate and hair-splitting reasoning. Gebser wrote:

Ratio must not be interpreted . . . as "understanding" or "common sense"; *ratio* implies calculation and, in particular, division, an aspect expressed by the concept of "rational numbers" which is used to designate fractions and decimals, i.e., divided whole numbers or parts of a whole. *This dividing aspect inherent in ratio and Rationalism—an aspect which has come to be the only valid one—is consistently overlooked, although it is of decisive importance to an assessment of our epoch.*²⁷

As expressed so poignantly in this passage, our own age is as much beset by the faults and problems brought on by the rule of the ego as that of the ancient Athenians, and indeed more so. Such problems include a tendency to adopt isolated and self-centered viewpoints, accompanied by wrangling and hair-splitting over trivial differences in opinion, and, with the help of the mythic and magic strata of the psyche, magnify these to monumental proportions and emotionally act them out in blind collectives. The result has been everything from the holy crusades and the Holocaust to the present threat to world cooperation and peace posed by nationalist and fundamentalist factions throughout the globe.

Even with all of this, however, the perspectival consciousness holds the seeds of a new form of cooperation, one that will reach completion only with the awakening of the aperspectival or integral structure. This is the ability to enter into cooperative exchanges with others while retaining a complete and developed awareness of one's own individuality. In relationships founded on such exchanges each party can pursue her for his own individuation while at the same time contributing to the goals held in common. Such relationships may involve a diad, as in the marriage relationship, a group of scholars with certain broad interests shared in common, or an economic community of separate nation states.

We may understand such collections of dynamic centers of self-initiated activity, engaged in exchanges that benefit both individual goals and mutual interests, as *synergistic* communities, in the general sense suggested by Ruth Benedict,²⁸ and in the recent specific formulation by mathematician and dynamical systems theorist Ralph Abraham.²⁹ Benedict defined synergy as a situation in which "any act or skill that advantages the individual at the same time advantages the group,"³⁰ She contrasted it with the opposite social situation in which "every act that advantages the individual is at the expense of others." Abraham has modelled this notion in the mathematics of dynamical systems theory.

Riane Eisler has developed a *partnership model* of cooperative interactions between individuals "in which social relations are primarily based on the principle of *linking* rather than ranking."³¹ The essential notion here is that human relationships, individual, political, or otherwise, have historically tended to fall into one of two attractor basins, to use the terminology of dynamical systems theory. One of these she terms the partnership model, described above, and the other she terms the *dominator model*. The latter emphasizes hierarchical relationships in which a small elite controls the lives of the majority by virtue of political power, financial influence, or simple brute strength. Such elites, almost always male, have for the most part determined the destiny of humanity since the Endoeuropean invasions of the peaceful Old European culture right down to the present day refusal of the American political elite to give up the nuclear weaponry that threatens to bankrupt the nation, if not to destroy the world outright.

The strength of the dominator system takes its origin from the ancient magical urge for power, an urge that undercuts all of the highest motives of compassion and reason. As Carl Jung observed, where there is will to power there is no love, and where there is love there is no will to power.

Even at its highest octave the best intentions of perspectival consciousness tend all too frequently to be undercut by self-centered egoic agendas, nit-picking, and

failure to see beyond one's own perspectival limitations. If sustained cooperation is to be achieved in personal relationships, in national and international economic ventures, and in the local, national, and international political areas, a more effective form of consciousness is needed. Such a form is integral or aperspectival consciousness.

The Integral Structure

The models for peaceful cooperation that are possible for the mental consciousness are also possible for the integral consciousness, which can carry them forward without the self-destructive limitations of the perspectival structure. Indeed, integral consciousness is not a structure among structures. It is, in part, the ability to experience all of the structures to their fullness without being consumed by any of them. It offers a clarity of awareness that stands above and yet contains all other structures. In integral consciousness it is possible to experience one's own motives and aspirations with increased transparency, and to see them in the context of the needs of others and of society and the world. It is also possible to overcome the ego's neurotic habit of concealing from itself its own self-serving agendas, while pursuing them with a vengeance in the world.

A central feature of aperspectival consciousness is freedom from the temporal and spatial constraints of perspectivity that allows it to view both objects and situations from multiple perspectives. This yields a degree of objectivity that no previous structure of consciousness could enjoy. Such objectivity carries a new and enlarged potential for understanding, respecting, and cooperating with others.

From the sober perspective of the last decade of the twentieth century the idea of a widespread emergence of the integral structure of consciousness may seem like the pipedream of a troubled world. Even though Gebser saw evidence of its coming in many spheres of human activity—from biology to music, from mathematics to jurisprudence, and from physics to poetry—the world seems no less turbulent today than when Gebser was writing in the 1940s and 1950s. There is, however, reason to be hopeful.

Developmental psychology tells us that flexibility in perspective begins with the perception of concrete objects and moves only slowly to more abstract spheres. Clearly there has been a trend that has gained momentum throughout the twentieth century in favor of an increasingly flexible understanding of abstract realities³². Its consequences have been varied. In some it has meant a sense of disorientation and loss of contact with reality. In others it brings a truly aperspectival playfulness toward belief systems previously regarded only in somber seriousness. As this playfulness matures, it brings with it the promise of a deeper understanding of the experiences and beliefs of others.

In recent decades the world community has become visibly interdependent. At the same time the vague but unmistakable outlines of a world culture are appearing on the horizon.³³ All of this lends hope to the possibility of a future in which cooperation is more than an ideal, but plays a central important role in human affairs.

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PART TWO

CULTURE AND HISTORY

In the following section Willis Harman examines the “peculiar endurance” of the competition model, and in the larger context of holism discusses the shift toward a cooperative one. He also suggests changes in traditional science to bring it into alignment with an emerging post-modern worldview. Following that, Ruth Benedict’s classic lost essay on social synergy is reprinted here. In it she examines the quality of life in a variety of human cultures in terms of cooperation and competition. Mathematician Ralph Abraham takes these as guidelines for a pioneering dynamical systems model of social interaction. Author and social theorist Riane Eisler, with Allan Combs, then looks at the long record of human history and prehistory, discovering two fundamentally different “attractors” or styles for human social organization: a *dominator* style that emphasizes competition, hierarchical organization and male dominance; and a *partnership* style that emphasizes cooperation, lateral organization and gender equality. Philosopher Min Jiayin’s essay details the historical role of cooperation in Chinese philosophy, focusing particularly on the influence of Confucius and, in modern times, imported notions of dialectic. Finally, philosopher and humanist Guy Burneko examines subtler resonances of the notion of cooperation as they emerge both from ancient Taoism and the post-modern appearance of the psychocosm in science and philosophy.

CHAPTER 5

The Emerging “Wholeness” Worldview and Its Probable Impact on Cooperation

Willis W. Harman

Cooperation is emerging as an organizing concept in management, organization, development, education, conflict resolution, social science, and to some extent in evolutionary theory. Other contributors to this volume have assembled evidence that evolution and animal behavior in the natural environment involve much more cooperation than ruthless competition; that our shared human nature involves much more love, caring, and cooperative behavior—and less naked aggression, brute competitiveness, and selfishness—than is typically assumed; that ordinary social interactions are much more cooperative than one would guess from what appears in our news sources; and that our society would not work nearly as smoothly as it does if cooperative behavior were not far more the norm than the usual social science perception would have it.

Cooperation in nature is far more widespread than they told us in school. “The paradigm of modern biology depicts nature as a ruthless struggle between opposing forces. . . . But paradoxically, it does not square with observation. Ruthless struggle between species can be induced artificially in the laboratory, but it is difficult to point out clear examples of mutual harm between natural species undisturbed by man.” (Augros and Stanciu, 1987; p. 89) It appears that, whereas biologists have tended “to seek competition everywhere and to overlook or downplay cooperation,” the biological world abounds with symbiotic relationships, some at least of which are not the relationship of prey to predator or parasite to host, but genuinely appear to be cooperative, driven by something more than and different from the survival instinct. As biologist Lewis Thomas says, “The urge to form partnerships, to link up in collaborative arrangements, is perhaps the oldest, strongest and most fundamental force in nature.” Yet this picture endures, of nature darkened by brutal competition, whereas with different eyes the central interdependence and cooperation would be obvious.

Cultural anthropologists can furnish many examples of the truism that the degree of cooperation and altruism in a society is directly related to that society’s worldview. Among the great diversity of societies that have evolved on this planet, there are many where one’s stature depends not on what one has, but on what one *gives*; not on how well one can compete, but how well one *cooperates*.

In spite of all this evidence and much more, we persist in holding a diminished

notion of “human nature.” It is considered more sophisticated to “face up” to the unpleasant image of humankind as aggressive and competitive like the brutes from which we evolved—and naive to perceive humans as innately cooperating and caring.

THE PECULIAR ENDURANCE OF THE COMPETITIVE MODEL

We have, in various sectors of science, the beginnings of a science of man/woman which takes as its subject matter the innate shared nature of humankind. Human nature can of course never be observed as such, but only in its specific manifestations in specific situations. It is a theoretical construction which can be inferred from empirical study of the behavior of humans. The method of the human sciences is to observe the reactions of persons to various individual and social conditions and from these observations to make inferences about human nature. Thus history and anthropology study the reactions of persons to cultural and social conditions different from our own; social psychology studies their reactions to various social settings within our own culture. Child psychology studies the reactions of the growing child to various situations; psychopathology tries to arrive at conclusions about human nature by studying its distortions under various pathogenic conditions.

Authoritarian thinkers through the ages have tended to assume the existence of a human nature, fixed and unchangeable, characterized by unruly sexual and aggressive urges, perhaps even by a tension between good and evil. This premise then justifies their ethical systems and social institutions. This dogma has influenced the human sciences, particularly in the 19th and the early part of this century. Progressives welcomed the 20th-century findings of anthropology and psychology which seemed to establish the unlimited malleability of human nature, since this meant that norms and institutions, the assumed cause of human nature, could be moldable too. But they arrived at an equally untenable position. The individual would then be only the puppet of social arrangements. If persons were nothing but the reflexes of culture patterns no social order could be criticized or judged, since there would be no independent platform from which to judge it. But such is not the case. To be sure, persons can adapt to slavery, or to a culture permeated by mutual distrust and hostility, or to cultural conditions which demand the repression of sexual strivings, or to almost any other cultural pattern. But insofar as these are contradictory to their nature, they develop mental and emotional disturbances which force them eventually to rise up and change these conditions.

But that means that another force is present beyond genetic composition and social conditioning—beyond nature and nurture. That third force is, clearly enough, human volition. However there are those among us whose worldview does not allow for any concept of “free will”; they would exclude volition, or reduce it to genetic makeup or conditioning. (As B. F. Skinner once put it, “freedom” is “a prescientific concept for behavior for which scientists have not yet found the cause.”) One worldview can cause us to overlook factors that would be obvious in another

worldview. For example, if we were in a different culture, it would be most natural to add still another force: the influence of karma.

THE INFLUENCE OF WORLDVIEW ON PERCEPTIONS OF INNATE COOPERATION

The actual and perceived extent of cooperation and altruism in modern society—whether cooperative tendencies are perceived as innate or needing to be learned or conditioned; whether they are perceived as potentially unlimited or ultimately overshadowed by selfish concerns; whether cooperation is perceived as unqualifiedly desirable to society or to be tempered by healthy competition—all these are intimately related to our dominant worldview. In modern society that prevailing worldview has become that of science. E. A. Burt, in *The Metaphysical Foundations of Modern Science* says, “In the last analysis, the ultimate picture that an age forms of the nature of the world is . . . the final controlling factor in all thinking whatever.”

The societies of Western Europe went through a fundamental transformation, roughly around the 17th century, which we know as the shift from medieval to modern times. The apparent advantages ensuing from this shift (which included the scientific revolution, the capitalist revolution, precursors of the industrial revolution just ahead, and the early stirrings of the liberal-democratic revolutions to come) resulted in modernism eventually spreading to become a dominant cultural force around the world. But what primarily characterized this period was the dramatic shift from the worldview of the Middle Ages to the view of modern times.

This was basically a shift from a worldview of oneness, connectedness, wholeness, to a worldview characterized by *separateness*—separateness of mind from matter, observer from observed, man from nature, “fundamental particles” and even persons from one another. The “separateness” paradigm has dominated science for several centuries, ever since the scientific revolution. That worldview contributed to weakening the religious base of values of Judeo-Christian tradition, to nihilistic tendencies of the modern world, to an emphasis on competitive over cooperative behavior, and to the dominance of economic over ecological and what might be termed “ecosophic” values (*eco*- habitat + *sophia* wisdom; values conducive to wise care of our home, planet Earth). The late 20th century version of the scientific worldview includes relativistic quantum physics, molecular biology, neo-Darwinistic evolutionary theory, the creation of order from chaos in “dissipative structures,” and “Big Bang” cosmology—but it is still physicalistic and ultimately encourages separateness, competition, and nihilism.

There are some indications of another fundamental shift in scientific paradigm, centrally involving the life sciences. Roger Sperry and a few others predict a “consciousness revolution” (1987); this might seem supported by such splinter movements as “philosophical psychology,” “humanistic sociology,” “transpersonal psychology,” etc. Brian Goodwin proposes a radical holistic “science of qualities” in the biological realm (1987). Whatever may be the fate of these specific proposals,

the underlying issue is of the utmost importance to questions of values, meanings, purposes—the bases of all civilizations.

FUNDAMENTAL PROBLEMS WITH PRESENT SCIENCE

We need to review the reasons for this brewing discontent with science in its present form. There seem to be at least *four broad categories of anomaly* that resist satisfactory explanation within the present paradigm:

(1) Our scientific knowledge about the universe appears to be incomplete in that there is no place in it for *the consciousness of the observer*—nor in general, for *volition* (“free will”) or any of the other attributes of consciousness.

Philosopher of science Marjorie Grene had made a somewhat broader point: “The question [is] whether material causes are ever adequate, without reference to formal causes, to explain the nature and existence of organized being. . . . Living things, unlike non-living, are doubly determinate. . . . At least a two-level ontology is needed for the interpretation of all living things. . . . No biological science is wholly molecular. . . . The relation, say, between cellular function and the chemical laws which specify necessary conditions for its operation, is *not* a complementarity like wave and particle. It is a hierarchical complementarity, in which the lower level leaves open boundary conditions to be specified by the laws of the higher level.” (1974) Nobel laureate Roger Sperry (1987) argued similarly with regard to consciousness, insisting that no science could be complete that did not include “downward causation,” from the higher level of consciousness to the lower, physico-chemical level.

The self constitutes a particularly challenging aspect of the consciousness puzzle. The conscious self is ineluctably involved in observation; yet the science constructed from those observations contains no place for the self. Certain individuals seem to have multiple personalities, and the shift from one self to another may be accompanied by measurable physiological changes, indicating that the holistic concept of “self” or “personality” has to be taken seriously. There is evidence, abundant and diverse although admittedly controversial, of survival of the self following physical death. Ian Stevenson (1987) has assembled impressive data suggestive of incarnation of the self in multiple lives. The “perennial wisdom,” distilled from the experience of the world’s spiritual traditions, finds the self existing on other ontological levels besides the space-time physical level.

(2) A fundamental *self-organizing force in living systems* remains unexplained. Recognizing the non-local self-organizing tendency in living systems reframes the old vitalist debate.

Living systems exhibit a tendency toward self-organization (e.g., homeostasis; intricate patterns in flowers, butterfly wings, etc.); toward preservation of integrity (e.g., healing and regeneration; ontogenesis from a single fertilized egg to an adult organism); toward survival of the organism and the species (e.g., complex instinctual patterns for protection and reproduction). Self-organizing appears from the smallest to the largest conceivable organisms. Whether the search for understanding is through some sort of “program” in the genes, or a “morphic field” metaphor,

or in terms of images in something akin to Jung’s “collective unconscious,” the attempt falls short of satisfactory explanation.

In evolutionary theory there appear to be two particularly profound challenges. One relates to the proposed mechanisms of evolution (random mutation, natural selection). Throughout evolution there seem to have taken place, over and over, the sudden emergence of new classes (such as mammals) and new orders (such as primates). There are no intermediate forms—nothing semi-mammal or semi-primate for example—and hence the concept of gradual evolution, by any mechanism, doesn’t fit the facts. The second challenge has to do with the total inadequacy of randomness to successfully account for the complexity, ingenuity, and elegance that is observable in the biological solutions that various organisms have come up with.

(3) The fundamental inquiry within physics into *the ultimate nature of things* does not appear to be convergent. (By that we mean that the search for more fundamental particles seems to lead to still more fundamental particles; the search for the ultimate reductionist explanation seems to point to a wholeness.)

(4) There remains the persistent puzzle of “action at a distance” or *non-local causality*. This shows up especially in the far reaches of quantum physics and in the area of what Jane Henry at U.K.’s Open University calls “meaningful coincidences,” where “meaningful” may refer to the subjective judgment of the observer, or to a judgment based in historical data (as in the case of astrology or the I Ching). (This term is intended to comprise Carl Jung’s “synchronicity” (Peat, 1987) and most of the range of “paranormal” or “psychic phenomena.” Its advantage is that it does not imply any particular kind of explanatory conceptual framework.)

As productive as science in its present form has been, it now appears that it has been biased toward high effectiveness in dealing with one highly valued kind of knowledge (that which leads to the ability to predict, control, and manipulate), resulting in a tendency to underplay other kinds of knowledge (e.g., having to do with value issues, such as conditions for optimum development). That bias has led to the consequences of the physicalistic paradigm as identified above.

In attempting to deal with such a disputatious issue, it will help to consider scientific inquiry as being made up of three parts:

(1) *Model-building and model-testing*. This comprises the chief *activity* of scientists. It is not unique to science; the main way in which little children learn about their environment is to create mental models and test them by experience. The uniqueness of scientific inquiry lies in the other two aspects.

(2) *The distinguishing values* of science, chief among which are openness of inquiry, healthy skepticism, and public validation of knowledge.

(3) *Adopted assumptions*. Practically all of modern science is characterized by certain *basic metaphysical assumptions* which are the result both of long-standing characteristics of Western culture and of the tension between science and the Church around the 17th century. The first two of these three aspects are unassailable. The third, however, is a product of the culture within which modern science was born and flourishes. The time may have come for a reassessment of these assumptions.

Among these metaphysical assumptions which have been assumed intrinsic to modern science, the most important are:

Objectivism: the assumption of an objective world which the observer can hold at a distance and study separately from himself;

Positivism: the assumption that the real world is what is physically measurable; and

Reductionism: the assumption that we come to really understand a phenomenon through studying the behavior of its elemental parts (e.g., fundamental particles).

In fact, these basic assumptions really boil down to a *single assumption of separateness*—separateness of observer from what is being observed; of the component parts of a system from one another; of “fundamental particles”; of investigators, competing over who was first discoverer. That one metaphysical assumption contains within it the seeds of other characteristics of modern science, including the three abovementioned assumptions.

This assumption of separateness was attractive to the early scientists both because of the practicability of focusing the new empirical methods initially on relatively simple, isolable physical systems, and also because it was compatible with confining science to the tangible, physical world. We can easily understand why the founders of modern science found it expedient to avoid conflict with the Church by restricting science so as to leave the mind and soul clearly within the jurisdiction of the Church. However, the consequence of that expedience was that science has not been very helpful in terms of our understanding of consciousness—or of religion.

Values and purpose find no place in the “separateness” paradigm; the observer seeks only to predict and control the objective world, subjective experience is not considered a valid source of knowledge, and consciousness has to be “explained away” because there is no room for it in the basic assumptions.

Thus the third aspect of modern science is characterized by the *ontological assumption of separateness* and the *epistemological assumption of physical sense data as the sole evidence on which to base our scientific picture of reality*.

THE POSSIBILITY OF A “WHOLENESS SCIENCE”

Society today has the exciting possibility of developing a complementary science based, not on “separateness” but on the “oneness” of things, on “wholeness.” Such a science would start from the assumption that everything is, in reality, part of a unity. Certain aspects of that unity can still be quite profitably studied by means of “separateness science,” but that kind of science would no longer have the authority to insist that we are innately aggressive and competitive, that we are here only through random causes, that the meaning of our lives is only what we arbitrarily assign, nor that our consciousness is “merely” the chemical and physical processes of the brain.

“Wholeness science” would include and emphasize more participative kinds of methodologies; it would assume that, whereas we learn certain kinds of things by distancing ourselves from the subject studied, we get another kind of knowledge from intuitively “becoming one with” the subject. We do not learn about reality from controlled experiments; rather, by identifying with the observed.

Openness to alternative theories and explanations, and healthy skepticism, are at

least as important as they have been in the present “separateness science.” Consensus validation also remains of central importance, but it will be accomplished in a somewhat different way.

We can get some sense of what this complementary science might be like if we try to imagine starting from the radical assumption of unity—from the holistic assumption that everything is really connected to everything else. (“Everything” here includes not only physical things but all things experienced—including sensations, emotions, feelings, motivations, thoughts.) If things are so interconnected that a change in one can affect all, then truly, everything is the cause of everything else. In other words, *there are not cause and effect; only a whole system evolving.* What normal science does, in this view, is to study relatively isolable systems where causal factors can be considered limited, and in particular, where no volitional factors need be taken into account. (To recall how special this is, note that the judicial setting comprises another special case, wherein volition and motivation are considered central.) It is apparent that if we imagine starting from the holistic assumption, then there is no separation of observer from observed. “Causality at a distance” is a nonproblem. We don’t find volition, consciousness, teleological influences, “meaningful coincidences,” etc. to be “anomalous.” None of present science is invalidated in the limited domains where it was generated, but some of its extrapolations become questionable.

One of the main implications of “wholeness science” is the assumption that we contact reality in not one, but two ways. One of these is through physical sense data—which form the basis of normal science. The other is through being ourselves part of the oneness—through a deep intuitive “inner knowing.” In other words, there is a basic epistemological issue involved: namely, whether our encountering of reality is limited to being aware of, and giving meaning to, the messages from our physical senses (sometimes referred to as “objective”), or whether it includes also a subjective aspect in an intuitive, aesthetic, spiritual, noetic and mystical sense. (It should not escape our notice that an intuitive and aesthetic factor already enters into normal science in various ways—for example, the aesthetic principle of “elegance”; the “principle of parsimony” in choosing between alternative explanations.)

WHAT ARE ADMISSIBLE DATA?

The rigid behaviorist approach to the human sciences, much in vogue in an earlier part of the century, insisted that human nature could be studied only through measurable behavior. The assumption that behavior is ultimately determined on a biological basis is an even further extreme.

Cognitive science is now beginning to deal with all three levels in human information processing—*neurophysiological*, *syntactic* (dealing with symbolic systems, formal structural characteristics of languages, etc.) and *semantic* (dealing with purposes and meanings). Consciousness, unconscious processes, meaning, thought, imagery, attention, memory etc. are treated as inferred, unobservable constructs based on reliable evidence. Volition, for example, is variously interpreted at different levels.

Some of what may feel like free choice may appear to be actually in genetic patterns; some may be early childhood conditioning. But that does not belie the fact that a component of volition associated with meanings and purposes, and that self-reports relating to those meanings and purposes, need also to be taken into account.

Needless to say, not all scientists agree as to what is admissible data from which to build the human sciences. Potential data would seem to fall in at least the following four categories:

1. *Those data admissible in the strict logical empiricism model—namely measurements of physical parameters.* A science limited to these data leaves out whole areas of experience where it is possible to achieve consensual agreement in other ways than common observation of physical measurements. Some of these data relate to our common inner experience and its implications for values and meanings. If this kind of experience is ignored within science, it most certainly will be dealt with elsewhere. But this invites return to the “science versus religion” kind of dualism, with all of its unanswered questions.

2. *Data depending on the connoisseurship of expert judges, such as those on which systematic (taxonomic) biology is based.* These data tend to support the concept of teleological factors operative in living organisms. As is well known, the predominant stance in the biological sciences is a faith that, although teleological metaphors and language abound, nevertheless ultimate biological explanations reside in the submolecular structure, and what may appear to be goal-seeking behavior, function, or purpose will eventually be understood from this biophysical level.

3. *Data which is essentially self-reports of subjective experience,* obtained in an environment that promotes high levels of trust and candor, subjected to sophisticated skepticism because of our known capability for self-deception, and checked in other ways wherever possible. (One example is the data on which are based scientific findings that analgesics relieve pain. A more troublesome example is self-reports regarding volition.)

4. *The subjective self-reports of trained “inner explorers” of various cultures.* With the word “trained” we are referring to a variety of meditative disciplines, yogas, and spiritual trainings that have been employed in many cultures. Of special interest are the reports of deep inner exploration that have led some to the concept of a common experience and a universal “primordial tradition” or “perennial wisdom” at the esoteric core of the world’s spiritual traditions.

We cannot afford to overlook the importance of the issue here. Science is the *only* generally recognized cognitive authority in the modern world. If we humans really are spiritual beings in a spiritual universe, and the dominant worldview of modern society—that of science—denies this, it is a fundamental and in the long run, costly error.

ESSENTIAL FEATURES OF A “WHOLENESS SCIENCE”

We are thus led to identify one of the essential features of the “wholeness science” which would overcome the problems associated with present science: It would open

its doors to *all four of the above categories of data*, thus presenting a more complete accounting of the totality of human experience.

As a corollary to this, it would replace rigid objectivism by a *more participative methodology*, recognizing that whereas one kind of knowledge is obtained through objectivistic science, one gains a different kind of knowledge by identifying with, intuitively becoming one with, that which is observed. In such research the experience of observing brings about sensitization and other changes in the observer. Thus an essential attribute of the participatory researcher is *the willingness to be transformed in the process of "sciencing."*

A "wholeness science" would recognize a hierarchy among the sciences, such that concepts and metaphors suited to the biological sciences are *not necessarily reducible* to explanations in terms of deterministic physical science; and concepts and metaphors suited to the study of human consciousness and its interactions with the total environment are *not necessarily reducible* to biological explanations. Thus, for example, this science would not insist that all biological explanation in principle can be reduced to physical and chemical causes, nor that phenomena involving human consciousness (such as cooperative or competitive attitudes) must either have a purely biological explanation or be explained on the basis of conditioning. A "wholeness science" would admit, as Roger Sperry urges, "inner conscious awareness as a *causal reality*" (1981).

Finally, whereas in the past, scientists have tended to insist that *teleological and value-focused questions* are not appropriate to science (overlooking that such questions are regularly asked in the health sciences, for instance)—such questions are deemed quite appropriate in a science based on wholeness rather than separateness.

THE IMPLICATIONS FOR SOCIETY

More and more people are sensing a need for fundamental change in the institutions of modern society, and in its official knowledge-validating system, namely science. There are a growing number of persons who have undergone some kind of personal transformation; who are already deeply concerned for the seemingly permanently perilous state of destructive conflict on the planet; and who in many cases are involved with more surface-level actions to preserve the environment, reduce toxic chemical emissions, build shelter for the homeless, etc. Many of these people are coming to understand that—somewhat as in psycho-neuro-immunology—the real causes of the societal illness lie deeper, in the dominant social paradigm itself. They need clarity regarding the necessary deeper-level shift; they already have the motivation to help bring about needed change.

Every thinking person received a lesson from the events in Eastern Europe in late 1989, about how fundamental societal change comes about. The number of discontented people grows, and the challenge to the legitimacy of the old order strengthens until, with relative suddenness, rapid change begins. *The reform is not led from the top*; the impetus comes from the vast middle-band of people who are relatively well educated, and are quite capable of succeeding in the old order but no longer find that fulfilling.

Thus the change in scientific paradigm may come—as the recent changes in Eastern Europe—much more rapidly than most of us have been expecting, with the force for change coming only partly from within the scientific community.

If science were to come to include a complementary body of knowledge based on the unitive or “wholeness” assumption, several important consequences can be postulated:

1. *It would tend to foster different attitudes toward nature.* We can imagine very different attitudes toward such issues as taking care of the environment; preserving species and habitat; avoiding irresponsible climate change, desertification, salination, etc.; raising animals for slaughtering; using animals in research, etc. This is not just a theoretical point; we have examples to look at. The worldview of the Native American Indian (and most other indigenous peoples as well) is just such a wholeness-based view, and the associated attitudes toward the Earth and our fellow creatures are there for anyone to observe. The Indian’s relationship to his environment has proven to be sustainable over many centuries, which has not been true for most of the “civilizations” that have appeared throughout history.

2. *It would result in science being more sympathetic to, and more amenable to research relating to, “meaningful coincidences.”* Survey research discloses that most people are aware of these “coincidences” in their lives; they definitely do not feel like random events. These include, for example, the “coincidence” of feeling that a distant loved one is in danger, and then receiving a confirming report. Another type of “coincidence” is that between the act of prayer and the occurrence of the prayed-for, such as healing. Yet another example is the feeling of having a “guardian angel” when a person feels warned about a danger, or provided with a particularly fortuitous circumstance in life. Other examples are in the areas of “hunches,” “miracles” and “psychic phenomena.”

3. *It would tend to stimulate research in the entire spectrum of states of consciousness.* These include “religious experiences”; experiences of “mystical” states of consciousness, of “other dimensions of reality.” These experiences have been at the heart of all cultures, including our own. They have been among the main sources of the deepest value commitments. They cannot be ignored; yet modern science has denied their significance.

4. *It would tend to foster a worldview supportive of the highest values of all societies.* Such a world view would contribute toward societal consensus with regard to central values, meanings, and purposes. It would support that attitude of cooperation and non-tribal “creative altruism” which Sorokin (1954) argued is the sine qua non for the continued existence of human civilization on the planet.

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CHAPTER 6

The Synergy Lectures

RUTH BENEDICT

Introduction by Allan Combs

There is no problem about which we need more enlightenment than about concrete ways in which synergy is set up in societies.

In her Bryn Mawr lectures of 1941 Ruth Benedict explored the relationship between social structure and human aggression, pivoting her discussion on a novel concept that she termed social synergy. This concept divided cultures in which the individual and the rest of society share in mutually beneficial interactions from those where individuals struggle in opposition to the rest of society. Benedict's real interest, shared with the graduate student Abraham Maslow, was to find some criteria that portrayed her intuition of what made a culture "nice," in other words, supportive rather than cruel to its members.

Such thoughts were tantamount to heresy at a time when anthropology, much by her own efforts, had finally put ethnocentrism on the run. To reopen the issue of whether certain cultures are humanistically superior to others would have been to release a hornet's nest of criticism and misinterpretation. Perhaps for these reasons, Dr. Benedict chose not to publish the sizable manuscript on which she based her lectures. Instead she consented to give it to Maslow for safe keeping. After he suffered a heart attack, however, he became concerned that he would not outlive her, and returned them. She died in 1948 and the manuscript was not located among her possessions, and has not been found since. Fortunately, a graduate student named John J. Honigmann, himself destined to become a prominent anthropologist, came into contact with the manuscript while it was in Maslow's possession and, recognizing its value, transcribed large parts of it by hand. These notes were later edited and published by Maslow and Honigmann in the *American Anthropologist*, from which the present article is taken.

Maslow, in fact, was deeply moved by the humanistic concept of synergy, and wrote about it in the mid-sixties in his *Eupsychian Management*. It generated considerable discussion in management circles at the time, but has since fallen into obscurity. It is hoped that its appearance in this volume, along with Ralph Abraham's treatment of it in systems terms will help bring this valuable notion to a broader audience.

[III]

The pressing problem about human behavior that I want to consider now is aggression. Aggression is behavior in which the aim is to injure another person or something that stands for him; it may be angry or resentful, combative or [secretively] malicious, but its object is to expel or humiliate another painfully. Is there any sociological condition that correlates with strong aggression and any that correlates with low aggression? . . . From all comparative material the conclusion that emerges is that societies where nonaggression is conspicuous have social orders in which the individual by the same act and at the same time serves his own advantage and that of the group. The problem is one of social engineering and depends upon how large the areas of mutual advantage are in any society. Nonaggression occurs not because people are unselfish and put social obligations above personal desires but because social arrangements make these two identical. Considered just logically, production—whether raising yams or catching fish—is a general benefit, and if no man-made institution distorts the fact that every harvest, every catch, adds to the village food supply, a man can be a good gardener and be also a social benefactor. He is advantaged, and his fellows are advantaged.

Let me give a simple example from the relations between a chief and his band. They may be set up for mutual advantage—the chief needs adherents to have chieftainship at all, the adherents want to belong to an outstanding band. Even if the chief must be exaggeratedly generous to be a “good” chief, it advantages him and his adherents, both in the same act. On the other hand, in another part of the world, a chief may hold his group by a rod of iron and exploit them for his private advantage.

I shall need a term for this gamut, a gamut that runs from one pole, where any act or skill that advantages the individual at the same time advantages the group, to the other pole, where every act that advantages the individual is at the expense of others. I shall call this gamut *synergy*, the old term used in medicine and theology to mean combined action. In medicine it meant the combined action of nerve centers, muscles, mental activities, remedies, which by combining produced a result greater than the run of their separate actions.

I shall speak of cultures with low synergy, where the social structure provides for acts that are mutually opposed and counteractive, and of cultures with high synergy, where it provides for acts that are mutually reinforcing.

There is no problem about which we need more enlightenment than about concrete ways in which synergy is set up in societies; and the way in which synergy is achieved differs according to the various ground plans [of the society]. [*Ground plans* refer to the basic structure of the society, whether it be entirely hierarchical, for example with a king and nobility, or divided into equal but separate clans, and so on.]

Anthropologists have not found any atomistic society with high synergy; courses of action in mutual opposition to each other are the order of the day, and the possibility of people joining together for common action is minimal. Nevertheless, areas of mutual benefit are set up in some degree in some atomistic societies. Among the Central Eskimo there are two major areas where people share a mutual

advantage: one in food supply and one in removing conditions that prevent successful fishing. When a seal is brought to the village, all those who are living there at the time share in the distribution. The seal hunter has demonstrated his own powers—which they value most highly as achievement—and at the same time all the villagers are fed. The other occasion on which they work together for mutual benefit is more backhanded; it is when they confess their sins. Their belief is that every broken tabu causes a veil of murky fog to settle around Sedna, the goddess of the sea and “owner” of all deep-sea animals, and when this murk banks up around her, the sea animals are hidden from the fisherman. Therefore the bank of fog caused by broken tabus must be annually removed. To do this everyone must gather and go through a check list of tabus confessing them all. The others chant: “It is a little thing. Let it not be held against us,” and when all have unburdened themselves, the shaman goes to Sedna at the bottom of the sea and clears the atmosphere. It is a typical common enterprise of an atomistic society; they support one another in the proceeding, but they have not harnessed something the individual is proud of doing to something the group wants done. The individual is not proud of his broken tabus; nevertheless the group supports him in this nonprideful activity in behalf of the common good.

Extremely low synergy in atomistic societies is the commoner rule. The man who can, takes what he can get; he seeks supernatural power to get his own way at the expense of others; he defeats others and humiliates them. He is his own court of last appeal. He is aggressive, acquisitive, tyrannous, vengeful, and insecure.

In all corporate societies the social order makes certain provisions for synergy. As homologous, segmented societies depend upon and build up in their members an experience of social solidarity within each separate segment of the society, however small a man’s own kin-group, his class, his village, his horde—whatever it is—that support him in his undertakings unless he defaults. The group may be so tiny and so at odds with other like segments of the society that it is in endless conflict with others. But somewhere there is a group to which one is united. If other factors in the social order make synergy low, the own group also is less dependable; but it is still there. This ground plan does not exist in primitive society without this primary provision for identification. And this identification is in terms of positive ends to be achieved—sharing of food, joining together in the hunt, worship of the totem ancestor, support of one’s brothers in getting a wife or financing marriage. Though there are also sometimes negative ends that are peculiar to this faction of the tribe—ends like defending itself against other clans in war or in a blood feud—they are not, except in almost suicidal tribes, the primary basis of solidarity as they often are between two tribes that have no dependence of any sort on one another.

[Such group synergy is shown in a variety of social arrangements: living together, taking meals, tasks in common, calling men of the same generation brothers, women sisters, and other men fathers; the chief’s position, if there is one, is one of responsibility rather than command; marriage is a collective venture of one house with another; young men are set up in production as soon as they are able to work.]

. . . [a society] with this ground plan often [has] provisions for synergy that extend over all the fractional units that make up the tribe. They are all ideally homologous and relations among them are not threatened by foreignness and

difference. They pool their individual masks or ceremonies or medicine bundles in great overall tribal ceremonies for common tribal blessing, like rain or human increase.

[There may be other sociological mechanisms for synergy in societies of this type, for example, age-societies, which unite a man with his age mates throughout the tribe. This way the men reaffirm tribal unity through age-grade activities from birth to death. Another example is double descent:] the strong localized groups may be made up of descendants through males, but cross cutting the whole tribe may be a warmer, more permissive matrilineal line that provides strong ties in groups outside one's own gens. One can act therefore to one's own advantage not only with one segmented group but also with the cross-cutting group, and a wider identification—tribally wider—is therefore structurally provided for.

When homologous societies are set up sociologically in such ways as these, the experience of the individual is unfamiliar to us. Structurally his society is like a joint-stock company sharing the profits and pooling the risks. Differences in the amounts of individual holdings certainly exist within it—that is, there are differences in status, in supernatural power, or in wealth—but that fact still leaves the joint-stock operations intact. No man is singled out among his fellows for humiliation because he is individually ruined; he is not individually ruined. He may be disciplined, even expelled from the tribe, for faults, but he is ordinarily given many chances to reform, and people are apt to wait patiently for his growth in wisdom and discretion. The whole course of his experience has inculcated in him a faith in the rewards of acting with his fellows. He sees life as an area of mutual advantages where by joint activity he attains his own personal desires. His thoughts and behavior have been shaped and molded by the whole course of his life, which has convinced him that his own goods are the goods of society. His achievements are the boast of his group and his group's prestige is his boast. Our theories of human nature must be wide enough to include the kind of behavior that occurs in such sociological settings. Will to power over people has not been called into being by his experience; fear of desertion, fear of humiliation, are only deterrents to improper behavior; and desertion and humiliation will not fall to his lot unless he defaults; he does not live in a threatening universe, and he does not have to snatch and grab to maintain himself.

This segmented ground plan may also be set up so that each separate group is at odds with the other. Because the groups are always set up as ideal duplicates, if there are prizes they can all try to appropriate to themselves alone, they will fight even though they are all intermarried and parts of a single tribe. In modern civilization it is our nations that are set up on this segmented ground plan, each with its own sovereignty, its own dream of a place in the sun, its stake in international trade. Naturally nations fight. In our international relations between sovereign nations there is anarchy; there are no mechanics to ensure peace among them. The mechanisms that provide mutual advantage have always, even in the smallest tribe, been reciprocity and joint-stock company arrangements, and these are absent in international affairs. I believe we are misled by mere scale and too easily believe that we are faced by a condition civilizations have not met before. Small scale or large, the fundamental condition of peace is federation for mutual advantage.

In the ground plan where interchange of *different* services is basic, there are again societies that foster aggression and those that do not. Again it is a question of whether they contribute their services to their mutual advantage. But, in contrast to homologous societies, difference is socially basic. It is sociologically a problem of making the separate services compatible with self-interest. The interests are almost inevitably different; the herder's interest is pasture, the farmer's a fenced field, the ironworker's his technological efficiency. And their rewards may be different. Conflict of class against class comes when the services of some group find no takers, and so far as we know from primitive corporate societies that have been studied, this dilemma was left for civilized societies to invent. The class war is not found in primitive societies. . .

The hierarchical ground plan, again, has tribes of high and low synergy. Here the crucial point is the relation to the state. The state may seek its own exclusive advantage at the expense of its citizens, and in primitive societies as in civilized groups this advantage has always been power—to have its will by naked power at the expense of the governed. We are wrong to think dictators are a new invention. Some African states have dictators who could give pointers to Hitler; each individual is reckoned as manpower of the king, and if he breaks a leg he is penalized because he has decreased the efficacy of that manpower; abortion is a crime because it lessens his manpower. . . Aggression is of course rampant. On the contrary, the Bathonga . . . are also hierarchical and conflicts are minimal because the king's advantage is the advantage of his subjects, and his subjects' advantage the king's advantage. He has responsible, not irresponsible, status; his family goods are the tribal goods, and his courts are not venial.

Whatever the special type of ground plan, therefore, synergy is set up sociologically by a social order that provides mutual advantage and eliminates activities at the expense of other groups involved. When synergy is high, psychological behavior responds; when it is low, it responds. . . To understand aggressiveness or nonaggressiveness, persecution or mutual helpfulness, in any human social group, one must check the social order and its man-made institutions for their provisions for social synergy.

[IV]

There is nothing we feel so personal about as we do about our likes and dislikes, our willingness and unwillingness, our confidence and our lack of confidence. It is by these things that we recognize ourselves, and when we explain them we fall back on incidents of our personal lives: the accident when we were five, a harsh, unsympathetic parent; a bad break in the office or the factory. And these are important. Individual differences in experiences, individual differences in temperament, are never absent even in the most regimented primitive culture, and the interplay between different individuals is something that can be studied in any culture. It always has social consequences and it is always important.

But our personal feeling about ourselves and our behavior needs much correction, and it will not serve, as it stands, as a basis for a science of behavior. Not just the

chance happenings of individual life, but also gross cultural facts have entered into one's experience. Last week I spoke of one of these great cultural contrasts. I spoke of societies with high social synergy, where their institutions ensure mutual advantage from their undertakings, and of societies with low social synergy, where the advantage of one individual becomes a victory over another and the majority who are not victorious must shift as they can. I spoke too of the differences the structure of society makes. One's family life has been one kind of thing if one was brought up in a tiny household of father and mother and own siblings, and divorce or death of one's parent could make a difference in whether one had food or education. It has been a different kind of thing if instead, in another culture, one was brought up in a clan house where a dozen or more mothers and fathers were practically indistinguishable and one's place could never be threatened by the divorce or death of one's parents because the unit of society was not an unstable conjugal pair but instead an extended family line of brothers and cousins and their children, all of whom would teach the child and give it adult implements to work with just as soon as the time had come for it to be interested in such things. One's experience is different if one's culture makes it a father's boast to support his children in everything even when they are married and themselves fathers, or whether it is humiliating to be dependent on one's father. One's life experience is different if economic institutions make it impossible to be hungry as long as anyone in one's world has food at all, or if they make it necessary that, like some Africans, you sell yourself or your children as debt-slaves if your individual harvest has failed.

Individual behavior, as one can see it in studies of different cultures, is never what it is as the "result" of any single selected phase of traditional life. . . . Actually, in order to understand individual behavior in different societies or epochs, it is necessary to know the *interaction* of all traditional institutions: childrearing and the economic order and the sexual arrangements and tabus. It is an illusion to seek for a single determinant.

Nevertheless, for purposes of description such categories as economic life and religion are necessary and helpful. And of course I must speak of economic arrangements. In so doing I am segregating one aspect of social synergy, and I am discussing economics specifically as it patterns aggression or non-aggression in individual behavior. . . .

. . . Primitive economic orders fall into two main types. The first of these I shall call the funnel system. All that the community produces you are to imagine going into the large end of the funnel, which collects everything and channels it toward the richest persons. The collective wealth has only one prime destination, the person who already has valuable possessions. This system depends upon certain men's claims to the labor of others, or upon ownership and the right of favored persons to corner certain articles of wealth. It reaches its highest development where there is interest and where wealth can be used to obtain forced labor. [The system has no relation to any particular state of economic development.] Among agricultural tribes of this type there must be ownership of land, although it need not be individual ownership. A family may own land in common, but a family of many workers can get into its control the bulk of available land, and the "have nots" can grow food only by renting the land. For this they must borrow, and with high interest

rates the renters are doomed to increasing indebtedness. Whenever a costly funeral or marriage must be celebrated, they go further and further into debt. The rich man gets richer and the poor man gets poorer, but no man in the funneling system can reach a security from which he cannot be dislodged either by other rich men ganging up on him, or by failure of crops, or by death in his family. He is insecure. His only security lies in having not merely much property but more property than his neighbor.

He is driven into rivalry with his peers and he must outdo them, better yet, if he can, undo them. He is driven into rivalry not because he is a bad man or because he is an ungenerous man but impersonally because the system works that way. Copying the rich man, the poor man competes too and tries to outdo other poor men. In primitive tribes this rivalry over and over again takes the form of heaping up goods in competition with one's rivals and letting them rot. . .

Nevertheless, even in tribes with a funnel system of economics all men have some access to means of production. If they are agriculturalists, there is land for sweet potatoes that they have a right to cultivate though the rice fields are beyond their means. If they are hunters, there are no game wardens. Some few tribes have individuals who are adrift and hungry, and some even sell the poor into slavery when they are in debt. But even slaves are fed and housed. By these provisions primitive funnel societies often attain a comparatively high synergy; they provide that essential means of livelihood shall not be put into the funnel at all, and hence food, clothing, and shelter cannot be diverted from the majority of the population to the man who is already rich. There is another mechanism found where the funnel system depends on exploited labor, and it is a mechanism with which we are all familiar because it was characteristic of feudalism. . . The feudal lord benefitted by his serfs' labor, but he was responsible for them too; he could not discharge them, for they belonged to the land. His responsibility included, too, protection against enemies. We are shocked at the low standard of living among feudal serfs in Europe in the Middle Ages, but there was nevertheless in certain centuries real exchange of services and responsibility on both sides. Primitive societies have sometimes used this pattern in feudal setups and built upon it stable and zestful societies, but such societies have ensured the mutual responsibility of lord and underling.

The second great pattern of economic orders is one I shall call the syphon system. This is the economy where wealth is constantly channeled away from the point of greatest concentration—from any point of concentration—and spread throughout the community. Thus, if one has fields, one's neighbors gather at work bees and one feeds and entertains them at planting, hoeing, and reaping seasons. . . The syphon system ensures great fluidity of wealth; if a man has meat or garden produce or horses or cattle, these give him no standing except as they pass through his hands to the tribe at large. Tribes often stage huge giveaways, which bring honor—and poverty—to the erstwhile owner. . . Constant fluidity of goods is ensured also in many cultures between intermarrying families. All the extended kin group unite in gift-giving not only at betrothal and marriage but also at birth of children and at death and even at the subsequent marriage of the children. Goods pass from hand to hand endlessly.

The syphon systems often begin their operation even before accumulation can

occur. In such societies produce is actually pooled whether or not it is stored in private storehouses. It is on call for public purposes like intervillage entertainments that are there the prime way in which prestige—group prestige—is achieved. . . . Since everyone is provided for . . . poverty is not a word to fear, and anxiety, which develops so luxuriantly in funnel societies, is absent to a degree that seems to us incredible. These are preeminently the societies of good will, where murder and suicide are rare or actually unknown. If such societies have periods of great scarcity, all members of the community cooperate to get through these periods as best they can. . . .

When one is studying aggression in different cultures, therefore, one of the things one looks for is the degree to which economic distribution is set up according to the syphon method or the funnel method. These two methods do not correlate with stages in human progress, but they are relevant to the kind of individual behavior that occurs. [We need not have selected economic order; we might have selected law and the state, structure and obligations of the kin group, sex and marital arrangements.]

[V]

Because the patterning of religion has in one sense a different significance from that of economics or the law or the state or the family, I have chosen religion as the other institution I shall speak of in relation to psychological behavior. For in their religion, societies have transcribed and apotheosized the cooperativeness or the aggressions their cultural life arouses. It is not true that the common element in all religions has been worship of a power that makes for righteousness; the will to righteousness has to be inculcated in the daily round of life or it will not find expression in religion. In their religions people have cast on a screen their hates and maliciousnesses if that was what their society inculcated, or warmth and righteousness if *that* was what was possible in their daily lives. You must remember that primitive people have no bibles . . . everything in primitive culture is preserved in the minds and bodies of living transmitters, who not only change the functions of religion with changing conditions as they are changed in our culture but also are then unable to check those changes against the gospel of an antique manuscript. . . . In any integrated primitive society, religion is a work of the imagination in which people have stated their thoughts and emotions, whatever they are, that their life in society has allowed them to have.

Societies with high synergy construct religions in which they pray and dance and sing for benefits that are benefits to all the tribe. These may be rain or good crops or a run of salmon or many children or general health or ensuring the success of the seasons. Their ceremonies may remove all evil influences, having right of way to all good things, or there may be worship or propitiation of tribal ancestor gods. In the elaborate servicing of these ceremonies many individuals have prideful roles, and often every person takes active part in the singing and dancing; even when some participate only as audience, they are included in the performance in a way not allowed to audiences in our culture. In such ceremonies there need be no conflict

between the pleasures we associate with a social dance or a general good time and those we associate with a cathedral Mass; social pleasures and worship mingle with no sense of incongruity.

In addition to the general tribal ceremonies, individual supernatural powers are always present. They may be amulets or charms, or they may be guardian spirits. . . In tribes of high synergy, amulets are used not to harm another but to strengthen oneself, and guardian spirits give power to win against tribal enemies, to cure the sick, and to name children—all of which are general benefits.

Tribes with low synergy, however, with little experience in their daily lives of any benefits not gained at the expense of others, typically build their religious practices upon these privately owned supernatural powers and use them according to the habits of aggression set up in their daily lives. They use them, if they are amulets, to bury in another's field and ruin the crops; if they are charms or spells, to bring starvation or smallpox or elephantiasis or madness upon a fellow tribesman; if they are guardian spirits, to go at their command to kill a rival in combat. Almost always these powers are bought either by payment of goods or of arduous service or they are inherited as private property. The extreme development of this sort of religion is the full practice of sorcery. Primitive people seldom make our distinctions between one kind of power, of God, and another, of the devil, but sorcery tribes frequently divide ambivalent supernatural power into low(which is for good) and high (which is for evil). In this way they can account for the fact that people with hardly any power may dally with curing, but people with real power will be occupied with working harm. Some tribes even believe that power for good does not really exist; the only way you can be cured of an illness is to prevail upon the person who has worked the sorcery to remove it. Any good that is worked by supernatural power is therefore only renouncing the evil sorcery.

In sorcery tribes the shadow of fear lies heavy over the society. In many such tribes a man who believes he has been cursed takes to his bed, refuses all care, and dies in two or three days with no diagnosable ailment. . .

Sorcery flourishes in societies of low synergy where people have good reasons to know that the universe they live in is hostile. They have no reason to expect good will from others, and they do not expect it either from their gods. The gods in such societies may be cannibalistic demons who lie in wait for men. They may be spirits busy about their own affairs who, when they concern themselves with men at all, enjoy playing tricks upon them. They may be powerful gods who have to be overcome and left prostrate before they will accede anything. For all people have made gods in their own image, and the ways in which they deal with them are ways they know are effective in dealing with human beings in their own culture. When they know they can get what they want in daily life by hurling insults at a rival, they may trust insult in getting their way from the gods; they may shout when they want rain: "You great beggars, give us rain!" Or they may threaten that they will end their ceremony by staging an incestuous rite so that the gods will come across. If they trust punishment in their daily life, they may threaten their idols or their sacred flutes that they will let them down into the river with the crocodiles. They do it, too. . .

To the comparative student therefore, religion is not an institution whose com-

mon characteristic is a striving for ethical values. Rather, it is a sensitive plate upon which peoples have inscribed their emotions and, in so doing, whether these are warm and affiliative feelings or whether they are hostile and malevolent ones, have given them a force of their own that heightens and carries further the love or the hostility with which their social order is charged.

The student of psychological behavior in different cultures will always check, therefore, the sorcery in any tribe, and when it is virulent, he knows he has before him the makings of great aggression and great abasement. Even when its worst effects are controlled by the state's making every sorcerer a malefactor, one does not find the friendliness and the psychic ease of behavior one finds in a tribe with a religion of high synergy.

[VI]

. . . The social arrangements are never just something outside the individual. The possibilities or impossibilities they create become his possibilities and impossibilities; they are internalized in men and women. The individual will have a type of functioning different from that of an individual in another culture and this functioning becomes steadily more irreversible. As a result of his immersion in one particular culture he will have a particular character structure. . .

[VII]

Societies with good morale fall into two classes in relation to humiliating institutions: on the one hand, they may not invent them at all, and on the other hand they may provide the individual with [readily] available techniques for wiping out the mortification, ways that will lead to higher prestige. Both methods are possible, and both give democratic societies that do not succumb to tyranny and sorcery. But the two methods are different and depend on fostering very different character structures in their members.

CHAPTER 7

Mathematical Cooperation

RALPH ABRAHAM

1. SOCIAL MODELS

Complex dynamical systems theory provides a modeling strategy for social systems, which are usually too complicated to model without a theory which allows chaos and bifurcation. These new models contribute to the hermeneutical circle for evolving social structures, in which mathematical help in understanding may be very welcome. Even the simplest social systems, such as two persons or two nations, tax our intuitive cognitive strategies. Dynamical models may be used as navigational aids for cooperation, or conflict resolution, in many situations in which good will prevails, yet does not suffice. Here we give a few examples of this art of building social models, *erodynamics*.

2. FIRST STEPS

Newton, soon after his development of the calculus in 1666, became interested in world history and prehistory. He pursued applications of astronomy to the *chronology of ancient kingdoms*, and probably envisioned dynamical models for cultural evolution. Our first recorded models for social systems are the Verhulst model for population growth, of 1837, and Richardson's model for the arms race, of 1919. This sequence accelerated after World War II with the syntheses of general systems theory and cybernetics. In the mathematical branch of these movements, *systems dynamics*, we have the extensive development of models for factories, cities, nations, the world monetary system, and many other systems. The work of Jay Forrester was central to this growth. The independent development of dynamical systems theory after Poincaré remained aloof from social applications until recently, and now a reunion of these two branches of mathematics is underway. In the Poincaré lineage, came the development of catastrophe theory by René Thom, its extensive application to social systems by Christopher Zeeman, and new dynamical models for economic systems by Steve Smale, in the 1970s. Since then, chaos theory has discovered systems with complex structure, and systems dynamics has discovered chaos.

3. ARMS RACES

Lewis Frye Richardson was an English physicist, meteorologist, and Quaker. A conscientious objector in the first World War, he served as an ambulance driver on

the front lines in France, and saw a great deal of death and suffering. He decided to devote his life to the elimination of war. He developed a *linear model* for the arms race between two nations, in which a spiral of increasing armaments in each nation resulted from mathematical laws, as shown in Figure 1. He felt that the individual nations caught in this kind of dynamic were innocent victims of an out-of-control global system. He submitted a paper on this model to a journal, fully confident that another war could be averted. However, as the paper was rejected, the second World War began. After this rejection, Richardson continued his work, trying to justify the model on the basis of actual armament statistics. In these efforts, he founded the field of *politicometrics*. In 1935, Gregory Bateson adapted the Richardson model to the process of the division of a culture into subcultures, analogous to differentiation in biological systems. He called this universal dynamical process for the development of a schism a *Richardsonian process of schismogenesis*.¹ Richardson's life work was published posthumously in 1968. In the 1970s, Isnard and Zeeman replaced this with a *nonlinear model*, the cusp catastrophe of Thom's theory, shown in Figure 2. They applied their model to the original arms race context of Richardson's work, showing how the model fit a situation of schismogenesis, in which the voting population of a democratic nation split into *hawks* and *doves*. Zeeman also adapted the cusp to model *anorexia nervosa*, an emotional disease in which gluttony and fasting alternate.² In 1985, Kadyrov, a systems scientist in Moscow, put together two of these cusp models into a *double-cusp model* for two nations engaged in an arms

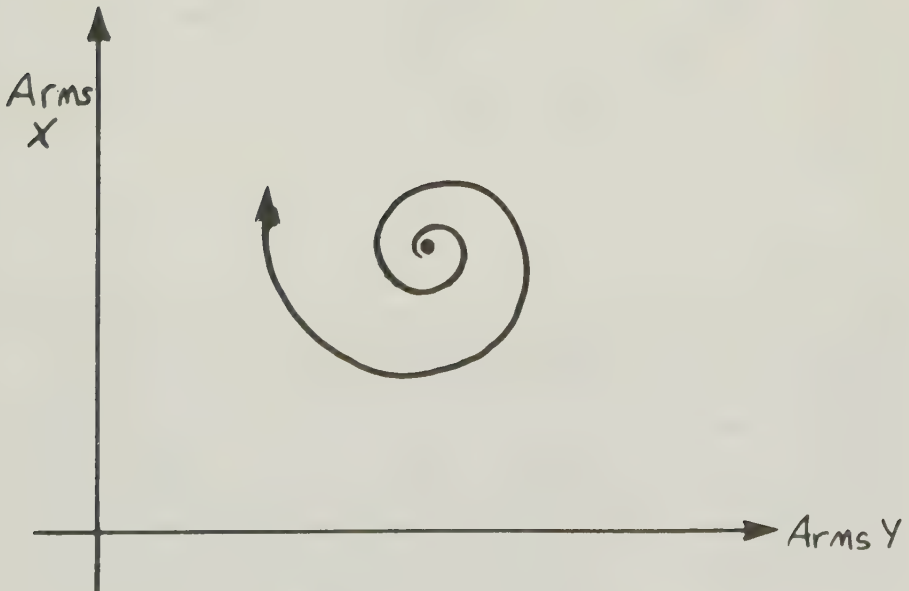


Figure 1. Richardson's spiral process.

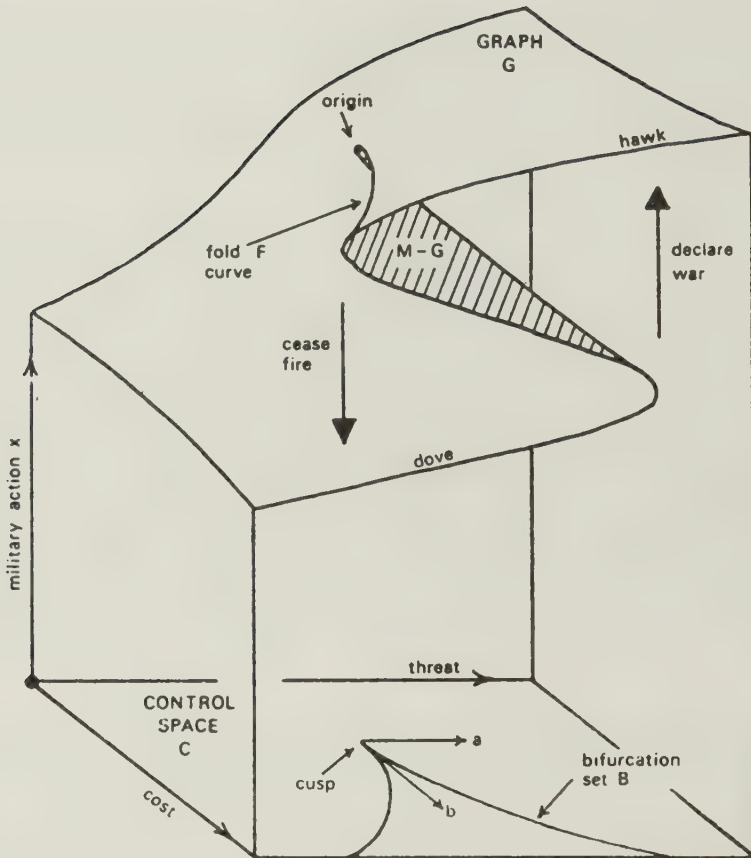


Figure 2. The cusp model.

race, completing the nonlinear version of Richardson's original model. It provides a map, in the two-dimensional space of sensitivities of each nation to armaments of the other, showing regions of different behaviors, such as hawks and hawks, hawk-sand doves, doves and hawks, and doves and doves, as shown in Figure 3. In the central region, labelled 4, there are four point attractors. In the two quadrants labelled 2, there are two point attractors. Surprisingly, in the north-west and south-east sectors of this map, Kadyrov found oscillating behavior. This might be significant in situations of codependence or addictive behavior.³ A slightly different double cusp map was used by Callahan and Sashin in the treatment of anorexia nervosa.⁴ Some other nonlinear adaptations of Richardson's model for the arms race have been studied by Mayer-Kress and Saperstein, who found chaotic behavior in their model.⁵

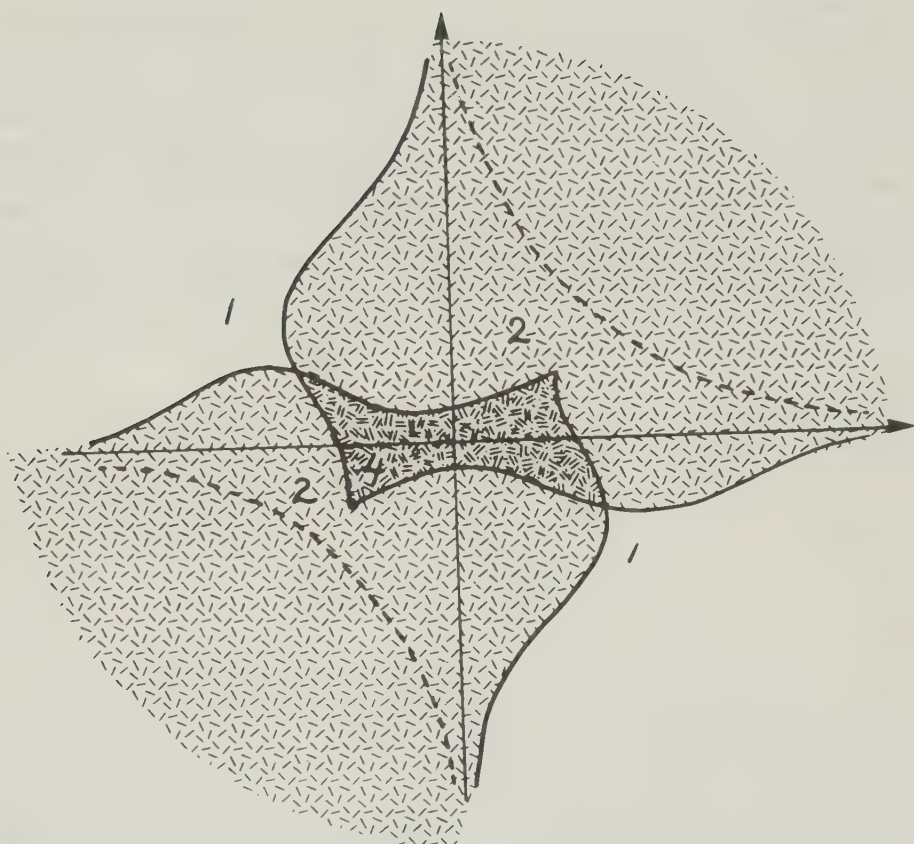


Figure 3. Kadyrov's map.

4. COOPERATION

Our goal in this section is to show that in a complex dynamical environment, a complex dynamical model may be used as a navigational aid, to improve the chances of achieving a mutually desired goal. Various examples of this navigational approach, basic to control theory, have been applied to politics (conflict resolution), medicine (surgical and pharmaceutical intervention), psychiatry (therapeutic strategies), and in many other areas. We may consider, as a typical application, the cooperation of two nations, or multi-national corporations, in trade, and use the Kadyrov model as an example. In this hypothetical situation, the control parameters in the double cusp model (the plane shown in Figure 3) would select strategies

such as trade restrictions, tariffs, credit limits, and so on. The state of each partner, rather than stockpiles of weapons, will be inventories of products.⁶ The two partners sit down to talk, and each must restrict their agreements according to the supervision of some group of stockholders or voters, which are subject to a process of schismogenesis into two camps, say conservatives and progressives. In the absence of a model, the complex dynamics of these four influence groups overwhelms and frightens the negotiators, and they may wish to risk little. They may at best make small adjustments in the status quo, and wait to observe the results and reactions.⁷ But now let us suppose that a complex dynamical model is at hand, the Kadyrov model for example, and that confidence in it, in this application, is firmly established in experience. The trading partners then may simply consult their

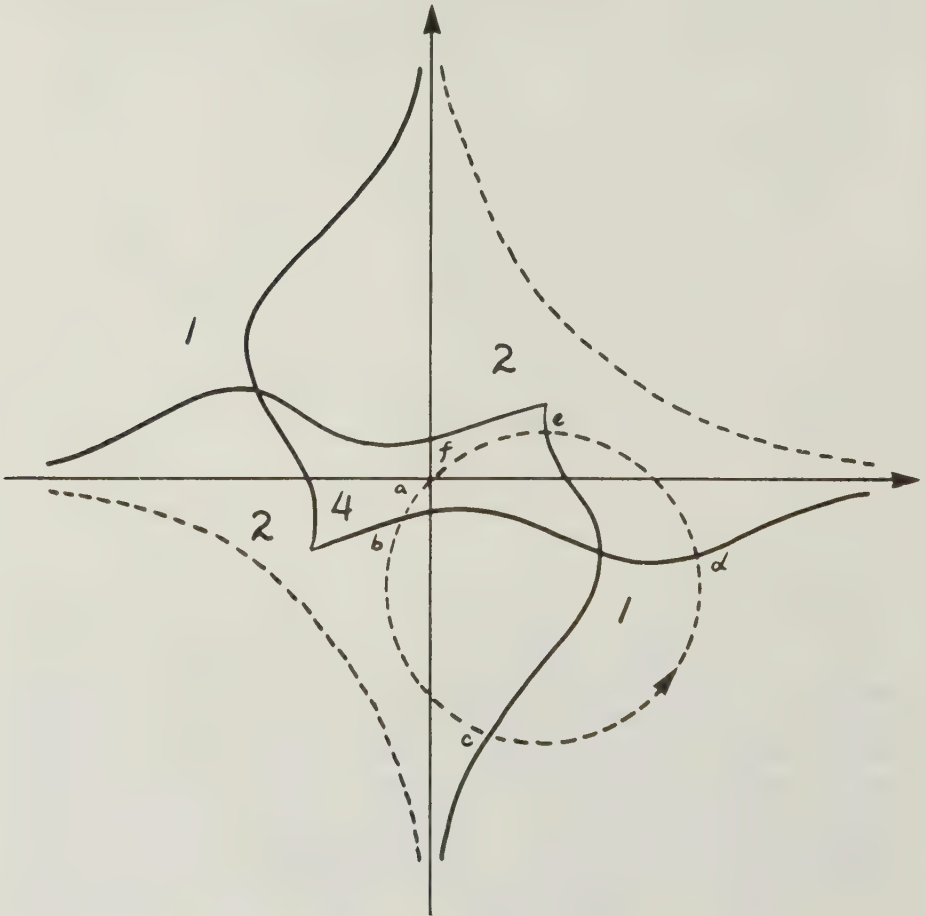


Figure 4. A cooperative strategy.

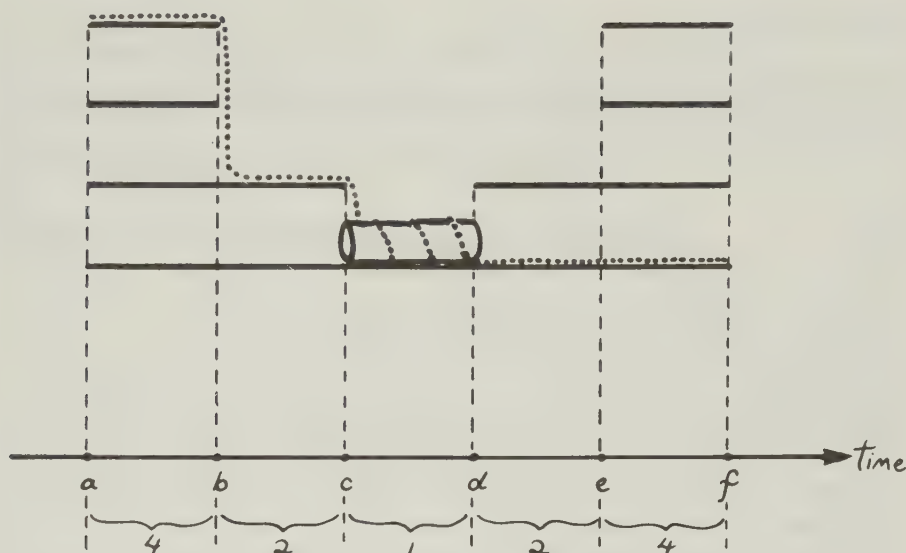


Figure 5. The bifurcation sequence.

data—quarterly statements, opinion polls, or whatever—and find their positions on the model map. This map applies to them jointly, not individually. They may then cooperate in choosing a strategy, a timed sequence of steps, from among the continuum of choices, with more courage than fear. One possibility is shown as the dotted curve in Figure 4. It is a short loop, to be traversed in a sequence of steps over a period of time, on a strict schedule. It is a closed loop in the space of strategies. And yet, while counter-intuitive, it achieves the mutually desired result with a minimum of cost. It leads the state of the joint system from the current state to a new state, after a sequence of bifurcations, shown in Figure 5. A similar approach has been used by Callahan and Sashin in the treatment of anorexia. It seems unlikely that this phased strategy shift would occur to the partners without a model. The oscillations in the Kadyrov model have been avoided as much as possible in this application, as they may be expensive states to maintain. However, if the subjects are lovers rather than trading partners, they may wish to maximize these vibrating states.

5. CONCLUSION

Here we rest our case. *Chaos*, the mathematics of complex dynamical systems, is in its infancy, and so are the social sciences. Joining forces under the banner of *Eros*, they may aid our future evolution in harmony with *Gaia*.

Acknowledgments

It is a pleasure to acknowledge the stimulus of my colleagues of the General Evolution Research Group, and the generosity of Gene Moriarty, Chris Zeeman, Gottfried Mayer-Kress, and Alan Garfinkel in sharing their ideas and resources.

Notes

1. See Bateson, 1972, p. 68.
2. For all of these cusp models, see Zeeman, 1977. For other psychological applications, see Postle, D.
3. See Abraham, 1991, for a description of this relatively inaccessible paper.
4. See Callahan, 1987.
5. See Saperstein.
6. The inspiration for this model is Morito, 1986, *Can This Be Love?*
7. This is the classical prisoner's dilemma, see Axelrod, 1984.

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CHAPTER 8

Cooperation, Competition, and Gylany: Cultural Evolution from a New Dynamic Perspective

RIANE EISLER and ALLAN COMBS

Much that we have been taught about what it means to be human derives from a single concept which we will call the dominator myth. According to this myth, it is natural and inevitable that violent aggression, armed conquest, and rule by domination govern social interactions.

This myth stands fast as an apology for every strong-man ruler who has trampled the lives of innocent people, from the bloody campaigns of King Sargon of Sumer in the third millennium B.C.E., to the modern day generals and swaggering politicians who flail their batons and threaten the survival of the planet. It has been the rationale for inequity, abuse, and insensitivity, be it in the family or the state.¹ And it has been used throughout recorded history to discourage attempts to fundamentally alter a system of social and ideological organization that in our time of nuclear bombs may soon take us to an evolutionary dead end.

The pages that follow examine an alternative myth and reality. They not only present a new perspective on our past; they point to the possibilities for a different future. They sketch a new dynamic model for our cultural evolution, not as a linear progression from “barbarism” to “civilization,” but as a dynamic process in which at critical bifurcations during periods of extreme system disequilibrium, fundamental social transformations have happened—and can again occur. And they take a fresh look at both cooperation and competition from this larger perspective.

THE DOMINATOR STORY OF HUMAN EVOLUTION

Justifications for brutality must always be compelling. Otherwise, few can continuously perpetrate insults and injuries on others. Justifications need to be explicit, emotionally compelling, and usually (though not always) beneficial to the person who is required to carry out, condone, or consent to actions that oppress, humiliate, brutalize, and exploit others.

In ancient Athens, this justification came in the form of a warrior ethic that lauded the glory of battle and the belief, articulated by Aristotle himself, that half of humanity (women) were inherently inferior and thus (like male and female slaves) naturally to be ruled by men.¹ In the ancient Hebraic and later Muslim and Christian cultures, cruelty and brutality were again sanctioned, this time by reli-

gious edicts—as all too vividly illustrated in the religiously prescribed Hebrew and Muslim stonings of women and the Church instigated Christian crusades, witch burnings, and holy inquisitions.

In the 19th and 20th centuries, as religious dogmas were in part replaced by secular dogmas, the dominator myth has found new advocates. It is expressed in leftist writings that justify violent socialist revolutions and the “dictatorship of the proletariat” as well as in rightist texts lauding the most aggressive and exploitive forms of capitalism. It has also been the underlying theme of many scientific writings, such as Darwinian biology and its derivatives: Herbert Spencer’s 19th century “Social Darwinism” and the works of many 20th century sociobiologists.

It is well known that Darwin’s notion of the “survival of the fittest” (a phrase actually coined by Spencer) has given both tacit and explicit sanction to social and economic philosophies that reward those who are strong and aggressive, while victimizing the weak. For it presents a concept of nature and humankind steeped in cutthroat competition. And this notion, without fundamental revision, has stood the test of time for a century and a half, despite the virtual absence of support from the quarter where one would most expect it, the study of animals in their natural habitats. (All of this is covered in Robert Augros and George Stanciu’s paper elsewhere in this collection.)

As a theory of biological origins, Darwinian ideas greatly colored our accepted notions of human nature, of society, and of the historical and anthropological record of our past. In Thomas Kuhn’s terms, it provided a paradigm that, canonized as science, has penetrated to the core not only the natural but also the social sciences.

The tilt that the dominator myth, undergirded by evolutionary theory, put on the story of our past was to project history as a heroic battle from barbarism up toward an “enlightened” modern world.² In this story, life in the Stone Age was the story of “man the hunter/warrior” who, by wit and will, fought against other men and a hostile nature. “Cavemen” were pictured as aggressive hunters, and women seemed to play little if any role.

This view of life in the Paleolithic reached a popular crescendo in the 1950’s, when cartoons always pictured cavemen with dull features and big clubs fighting dinosaurs (which actually became extinct before humans came on the evolutionary scene) or one another, unless they were busy dragging women around by their hair. Nature programs from that era (and still today) proclaim *ad nauseam* how the mother cheetah (bear, deer, duck, you name it) teaches its young to survive against great odds in a harsh world of nature. And they primarily show animals stalking and devouring one another—even though most animals in fact spend only a small segment of their day hunting and eating.

For humankind, this brutish struggle for survival was said to continue till eight to ten thousand years ago, when the “Neolithic Revolution” brought an abrupt improvement in the quality of life with the domestication of plants and animals. Farming replaced hunting as the principal source of sustenance, and small villages sprang up throughout the Near East. But even then, so the story goes, in the Neolithic, aggression and domination were still the governing principles.

Indeed, according to some 19th century theorists (including Engels), it was to social and technological progress that we owe slavery, male-dominance, and war-

fare.³ Moreover, this view has in various permutations persisted to our day, permeating the so-called structuralist analyses that hold that greater social and technological complexity inevitably lead to hierarchies of domination backed up by force and fear.

Thus, we are told that during the period following the Neolithic—when large-scale farming became prevalent, cities grew to respectable size, trade-routes were established, kingdoms grew, and city-states and empires came under the rulership of elite classes of priests and nobility—aggression and domination inevitably became even more paramount. And even when religion was transformed from “primitive animal worship” (animism) and quaint “fertility cults” (Goddess-worship) to great male-dominated polytheisms, or monotheism in the case of Israel, (setting the stage for the “real” religions we know today), aggression and domination were still the primary concerns of both secular and religious men.

This story of domination and aggression (of powerful emperors, heroic warriors, and the priests, bards, artists, and later also scientists who served them) goes on to include the rise and spread of Hellenic culture, the appearance of a world-class civilization in the form of the Roman Empire, and, with an unfortunate pause for the Middle Ages, on to the Age of Enlightenment and the science, philosophy, and economics of the modern world.

We all know this story. In it we find the dominator myth repeated over and over. It includes the idea that might makes right; that safety is to be found in compliance and conformity; that men are naturally suited to rule and women are naturally suited to follow; that great societies come structured in bureaucratic hierarchies; and that within such hierarchies individuals must find their proper places. But, as we will briefly develop in the following pages, there is ample reason to question all of these assumptions.

A DYNAMIC VIEW OF HUMAN HISTORY

To begin with, the idea that evolution struggles forward at a raw competitive clip seems, by the standards of today’s biology, not only oversimplified but a misconception. Closer to the mark is the notion of natural drift, the gradual and continuous adjustment of the organism (individual and social) to a changing environment.⁴ Since in the total ecosystem the organism and its environment play entirely interactive roles, this is a continual tuning of the organism within its participatory world.

Moreover, the long view of our own species-history seen from the perspective of a new generation of archaeologists is beginning to present a very different picture of our cultural evolution—one that even in overview does not give the appearance of a linear ascent along a trajectory reaching from barbarism to modern civilization.¹ For example, there is little evidence of weapons used by humans against humans from the Upper Paleolithic and the first few millennia of the Neolithic.⁵ And despite earlier interpretations conforming to the preconceived idea of our early cultural evolution as the story of man the hunter/warrior, the spectacular cave art of the ancient European Magdalenian culture presents us but a few images that even suggest “sympathetic hunting magic.”

Reindeer, which dominate faunal remains of the period, appear only infrequently in the profusion of animals represented on cave walls and ceilings.⁶ And

when they do appear, as Alexander Marshack points out, it is usually not because they are being hunted but because their new-grown antlers announce the coming of Spring.⁷

There are also, again in contradiction to earlier interpretations, very few clear instances of arrows or other weapons in this extensive prehistoric art. What to earlier archaeologists appeared to be spears and arrows has usually turned out on closer inspection to be blades of grass or tufts of grain—thus solving the problem earlier scholars called the puzzle of “wrong way weapons,” which not only seemed to be “chronically missing their mark,” but in which the barbs or arrows seemed to be going the “wrong way.”⁷

The many animals in Paleolithic art seem as a whole to be calm and relaxed, or moving easily and spontaneously rather than in flight. This is hardly what one would expect if, as earlier scholars claimed, that culture relied on coordinated hunting expeditions for its livelihood. In fact, we are now learning, from both contemporary foraging peoples and from analyses of protohistoric remains, that hunting was most probably of secondary, rather than primary, importance in this forest culture, where the gathering of naturally available foodstuffs was far more likely to have been the chief source of livelihood.

What is more, modern scholars look with increasing difficulty for a “Neolithic Revolution” marking an abrupt change in the life style of Europe and the Middle East.² It now seems that grain was already domesticated in the Middle East several thousand years earlier and that the shift towards its systematic planting and harvesting probably took several millennia.⁸

Even more important—and flatly contradicting the old archaeological stereotypes of primitive Neolithic villages—is that we now know from recent excavations as well as far more scientific dating methods that many early farming communities were in fact remarkably advanced. For example, excavations carried on after World War II in Turkey have revealed the Neolithic site of Catal Huyuk, dating back to the 7th millennium B.C.E., where, as the British archaeologist James Mellaart reports, we find “rich evidence of a remarkably advanced civilization” that was a “center of art in a period that hitherto had been regarded as inartistic.”⁹ Further exploding earlier stereotypes about our cultural evolution—and specifically about a warlike Neolithic—he reports that there are no signs of destruction through warfare at this important ancient site.

Our understanding of ancient myth and religion is also undergoing major revisions. Beginning with the Gravettian cultural period of about 20,000 B.C.E., archaeologists have unearthed many female figurines. These they called “Venus” figurines, and sometimes described as strange manifestations of “male erotica”—even though these figures are characterized by exaggerated breasts and buttocks and are often manifestly pregnant.

The more contemporary, and sensible, interpretation is that these female sculptures represent the beginnings of a religious sentiment focusing on the female as the embodiment of the life-giving and sustaining power of the universe. As Mellaart notes, these figures are indications of a religious consciousness that later blossomed in the Neolithic, where in Catal Huyuk and other settlements, religion centered on the worship of a Great Goddess.

UCLA archaeologist Marija Gimbutas describes this form of worship as the

celebration of life energy.¹⁰ The Goddess represented both the reproductive and destructive forces of nature, as manifested in the cyclic pattern of the seasons and the cyclic patterns of human life and of woman's body. She stood for the regeneration of life at the crisis of death, and for the rebirth of nature every Spring—a religious motif that we can now see goes back all the way to the Paleolithic and later continues in Europe and the Middle East (as well as in other regions of the world) well into historic times.

Over the past few decades, Gimbutas has been a leader in unearthing and bringing into focus a previously unsuspected Old European civilization in Eastern Europe and other regions around the Mediterranean that was guided by a Goddess-centered religion.^{11,12} Gimbutas writes of these prehistoric cultures: “There are no depictions of arms (weapons used against other humans) in any Paleolithic cave paintings. . . no remains of weapons used by man against man, no signs of groups of humans being slaughtered. Similar observations can be made of Old Europe, where cities were located for beauty and convenience rather than for defense, and agriculture provided the source of material needs.”¹⁰

At its peak, Old Europe could afford to invest in religious art (pottery and frescos), colorful clothing, clean and comfortable living quarters, and had the time and energy for joyful celebration. This is not to say it was an ideal or utopian society, but it was not a society where men dominated women and “weaker” men or where killing, raping, and pillaging was glorified in art or life. So once again, we have strong evidence of a society that does not conform to the dominator myth.

This European civilization lasted from about 6500–3500 B.C.E., and in some places, particularly in the amazingly technologically and culturally developed “high civilization” of Minoan Crete, survived as late as approximately 1500 B.C.E. As the Greek archaeologist Nicolas Platon writes, Minoan culture (not discovered by archeologists until the beginning of the 20th century) was also remarkably peaceful.¹³ Moreover, Minoan civilization is characterized by the important role both women and the “feminine” play in all aspects of life, as reflected in an art that scholars consider unique in the annals of civilization—not only for its exquisite beauty but for its celebration and joy of life. In short, the Minoan culture flatly contradicts the notion that human civilization always has been—and by implication always must be—characterized by war, male dominance, and strong-man rule.

GYLANY AND ANDROCRACY AS SOCIAL ATTRACTORS

In the past, societies that were not *patriarchies* or *androcracies* (ruled by men) were described as *matriarchies* or *gynocracies* (ruled by women). This was in keeping with the dominator myth that the only alternative to a society dominated by men is a society dominated by women. But in the societies we have briefly described there is no evidence of the oppression of men by women. Rather, there are signs of mutual respect for both genders and of a general spirit of peace and partnership.

One of the authors has introduced the terms *partnership* or *gylany* to describe this type of society.¹ *Gy* is from the Greek root word, *gyne*, or woman, and *an* is from the Greek *andros*, for man. The letter *l* represents the relationship of linking (as contrasted to force-based ranking), as the primary principle of social organization.

The story of the fall of Old Europe and other more gynanically oriented earlier civilizations and the gradual emergence of both dominator realities and myths is told in detail in *The Chalice and The Blade: Our History, Our Future*.¹ Very briefly, what the archaeological and mythical evidence indicates is that these civilizations were repeatedly invaded, with increasing penetration, by waves of nomadic peoples whose principal technologies were those of warfare and conquest. In Europe, these horse-riding peoples are termed *Kurgans* by Gimbutas, after the barrow graves in which they buried their dead (*kurgan* means “barrow” in Russian).¹⁰

Kurgan society was strongly male dominated, war-like, and aggressively competitive. It valued strength and brutality over creativity and gentleness. Its eventual effect on Old Europe was to bring about nothing short of a collapse of civilization into a dark age from which the “ancient civilizations” we are accustomed to hearing about took their origin. These civilizations—ancient Sumer and Babylon and later Greece and Palestine—emerged in the shadow of the dominator myth and continued to develop in accordance with its strident cadence. The “nightmare” of history, to borrow James Joyce’s term, had begun.

But societies that orient more to a gynanic or partnership model, of which the civilizations of Minoan Crete and of Old Europe are remarkable examples, stand as testimony against the dominator myth that a successful social order must be warlike and hierarchic, with men most suited to sit at the top. They stand as testimony against the dominator message that creativity and intellectual freedom must represent a threat to society as a whole, and against the insidious notion that, for the masses, safety and security come only within the rankings where persons are cloistered in bureaucratic niches and cease to be complete human beings.

They also stand in stark contrast to the dominator myth of progress, according to which society climbs ever-forward in a heroic struggle for survival, a struggle that, in its highest form, leads to an industrial, vertically structured, dog-eat-dog, brutally competitive social order. For it now seems that in many significant ways life was less brutal and far more joyful in Old Europe than in the later Christian era, or in our own modern industrialized world—to say nothing of the privation of Third World countries, whose economics have been subverted to the service of the so-called First World and all too often to the greed of indigenous male elites who exploit and dominate their own people.

From a dynamical systems perspective, the extent and stability of gynanically oriented cultures that lasted for millennia in Europe, the Middle East, and other world regions lend them the character of what we may call a major gynanic social attractor.¹ This is equivalent to saying that this way of structuring human relations represented a stable, self-sustaining, social configuration, one which could only be up-ended by a major shift in the dynamic forces that bounded it. (In the language of dynamical systems these forces are called *control variables*.)

Such a shift was evidently brought about through a process of tremendous ecological and social upheavals, including massive changes in climate, which we are now learning led to the invasions of Kurgans and other pastoral peoples from the arid steppes and deserts. As we have seen, the social order of these peoples was controlled by a different attractor pattern, one orienting to the dominator myth. Though the transition was gradual, by the time it was complete it had taken on the

tones of a full-fledged catastrophic bifurcation to the new pattern of male domination, hierarchy, oppression—in short, to a dominator or androcratic model of society.

Viewed from the dynamic perspective briefly sketched in the foregoing, each of these two attractors represents a center of gravity, a singularity, that draws to itself any similar pattern of social organization. For example, the United States' political history is witness to a constant struggle for control by male-dominant, elitist, dogmatic, and fundamentalist factions, despite the strong egalitarian principles in the country's constitution. In other words, it is characterized by the tension between a gylanic or partnership attractor and an androcratic or dominator attractor.

As one of the authors has developed in some detail elsewhere, this tension has underlain all of human history, both ancient and modern.¹ For example, after the more gylanic period of the Weimar Republic, in the rise of the Third Reich Germany was drawn entirely into the dominator singularity, as were other fascist states of that period. Similarly, early Christianity, in its emphasis on so-called "feminine" values such as caring, compassion, and non-violence, represented a strong gylanic thrust. But the dominator model was once again the primary attractor for the highly hierarchic, male-dominant, and violent institutionalized Church that followed, with its persecutions of heretics, witch burnings, and holy inquisitions.

Even our myths verify the tension between a gylanic or partnership and androcratic or dominator model of society. For example, blueprints for the dominator model are found in both the Judeo-Christian Bible and the philosophy of Aristotle. Aristotle's ordered hierarchic cosmos, as a rational mythology, posits a hard vertical order to reality, as do his assertions that the observable social order of his time (the domination of men over women and free men over slaves) was the natural order; in other words that what is has to be and, according to Aristotle, also should be. Similarly, the Hebraic version of this dominator myth places a male god at the top who, as biblical history unfolds, proves himself "a jealous god" capable of considerable violence. This male deity, exfoliated in the many later renditions of the Muslim-Judeo-Christian theological triad, would become the model for male rulers in the form of kings and priests, all of whom stand above ordinary folk, and also set the model for male supremacy throughout the cultural and geographical extent of the dominion of that triad.

However, Greek and Hebrew myths also offer us clues to the earlier gylanic order. For example, the Greek poet Hesiod, who wrote about the same time as Homer, writes of a "golden race" who tilled their fields in peaceful ease (the people of the Neolithic) before a "lesser race" brought in Ares, the Greek god of war (which classicists point out is a reference to the Kurgans' successors, the Achaeans and Dorian invaders of Europe).¹⁵ Similarly, in the biblical story of the Garden of Eden, we read of an earlier time when woman and man lived in harmony with one another and with nature—a time before a male god decreed that henceforth woman be subservient to man.

Indeed, the story of history could be retold, not as the dominator myth of the struggle of the few for power over the many, but of the numerous partial resurgences of the gylanic or partnership order and, until now their often brutal

suppression. The outlines of this story are also told in *The Chalice and the Blade: Our History, Our Future*, which further documents the unprecedentedly strong gylanic movement of our time, and how, if the contemporary gylanic resurgence were to acquire sufficient momentum, the entire order of society could be propelled across a threshold into the sphere of influence (*basin* is the technical term) of the gylanic attractor.

Talk of such a transition may seem idealistic in a strife-torn world. But in fact, the political and economic landscape of the contemporary globe presents us with the spectacle of a dynamic interplay of these two attractors. What we are seeing is an unprecedentedly powerful gylanic thrust, countered by extremely strong dominator resistance.

In modern Western history the gylanic or partnership upsurge had its beginnings in the 18th century, in a fledgling effort to break through a rigidly hierarchic familial and social order, enforced by both temporal and spiritual controls. More recently, we have seen major partnership advances in Europe, although these are once again threatened by the dominator themes of anti-semitism, racism, anti-feminism, parochial nationality, and acts of violent repression.

While there is today also a powerful international gylanic movement for peace, ecological balance, women's rights, economic democracy, and other partnership goals, there is also very strong androcratic or dominator systems resistance. For example, the so-called fundamentalist religious movement in both the East and West is basically a movement to re-instate rigid male dominance, authoritarian hierarchies, and "holy wars"—in other words the dominator or androcratic model. Moreover, the dominator model remains strong in many parts of the world, including some Third World countries that will soon have access to extremely destructive weaponry—as is already dramatically illustrated by Saddam Hussein's Iraq. Indeed, the implementation of technology for better weapons rather than for greater creativity and the well-being of the people is a prime characteristic of the dominator order—one that in our high technology age (when weapons systems run in the billions of dollars) threatens to bankrupt our planet.

COMPETITION, COOPERATION, AND OUR CHOICES FOR THE FUTURE

Because of the growing perception that fundamental change is imperative, much has been written about the urgent need for a world order based on cooperation rather than competition. But it is here important to understand that the term cooperation has more than one meaning, and can be applied to the service of more than one goal.¹⁶

Cooperation in a dominator order means compliance, anonymity in the ranks, and the loss of creativity and individuality. Indeed, it means the loss of much of what it means to be human. This loss is a theme in literature since Dostoevski's *Notes from Underground*, and nowhere is treated so powerfully as by Kafka in *The Metamorphosis*, where the protagonist actually turns into an insect.

Cooperation in the dominator order usually occurs within a larger context of competition, so that while individuals may cooperate in a team, state, or nation,

they are ultimately in competition with some other team, state, or nation. The larger frame is that of a win-lose mentality.

In short, cooperation is not exclusive to gylanic or partnership societies. In the approximately 5,000 year-span of recorded dominator history, men have often cooperated to go to war against “dangerous” or “inferior” peoples, to persecute “infidels,” and to maintain male supremacy over women. The point is that cooperation also exists in dominator systems, but that here it is driven by mistrust, fear, and aggression and by the dominator model’s in-group versus out-group, superior/inferior, dominator/dominated model of the human species—beginning with the domination of the male half of humanity over the female half.

The shift from an androcratic to a gylanic system is thus not the simplistic shift from competition to cooperation.¹⁶ Indeed, despite the justifiably bad name competition has acquired through its association with domination and conquest, competition is not categorically undesirable. We all enjoy the challenge of competition when it stimulates excitement and creativity, and acts in the service of a larger humane effort. The total absence of competition can, in reality, translate into a social reward structure that lacks the efficiency to encourage productive and creative work.

For example, unions, in some instances, have eliminated competition from factory jobs and ended up with patently unmotivated employees. American tourists have, in the past, been amazed at the unwillingness of Moscow taxi drivers to pick up passengers. They were evidently paid on a state schedule, so that there simply was no incentive to compete for passengers.

On the other hand, uncontrolled competition in a dominator order can be a rampantly destructive force, as is all too visible in the world today. Economically, we see it in the aggressive buy-outs and the casino atmosphere of the world stock markets. Politically, we see it in blatant and unapologetic military aggression.

The gylanic ethic accepts nondestructive competition in win/win situations, but only within a broader partnership context.¹⁷ It emphasizes a social order that, at its roots, is not built on competition, but the linking up of individuals, groups, institutions, and nations in cooperative and mutually beneficial endeavors.

Such an order values diversity rather than automatically equating it with inferiority or superiority. Thus, it treats women and men as equal in value, contributing equally, and having equal opportunity to live free, creative, and fulfilling lives.

It also values sharing over the accumulation of wealth in the hands of a few, and creativity and free inquiry over control and restraint. And, unlike a dominator or androcratic society, it gives operational priority to so-called soft or feminine values such as caring, compassion, and non-violence, rather than relegating them to women and “effeminate” or “unmanly” men.

Lest this talk of dominator gender stereotypes be misinterpreted in terms of the all too familiar dominator “war of the sexes,” what we are here talking about is, of course, not a question of women against men or men against women. Rather, it is a question of fundamental social, economic, and ideological transformation.

As we have seen, the emerging new view of our cultural evolution indicates that fundamental systems shifts are possible—and in fact already occurred in our prehistoric past. The dynamic model of social evolution here sketched out, of

gylany and androcracy as social attractors, also makes it possible to see the increasing power of gylany as a social attractor in our time.

This is by no means to say that the opportunity for a fundamental social shift offered by this period of social, economic, and ideological systems instability will necessarily lead to a successful gylanic transformation. To complete the shift to a partnership society will require fundamental structural changes in all our institutions, from the family and the workplace to the way that we structure international relations and our relations with nature.

Some of these changes are already underway. For example, many multinational corporations are beginning to understand the survival advantages of teamwork, as well as of the integration of racial and gender diversity and the shift from abusive and strong-man management styles based on fear and top-down orders to more supportive and nurturing styles, which have been shown to elicit greater productivity and creativity. These ideas are discussed elsewhere in this collection. But there is also here enormous dominator resistance—as there is to other structural changes, such as changes from a dominator to a partnership family.

A successful shift from androcracy to gylany will require that far greater attention is paid to fundamental changes in gender stereotypes, which are basic to the attitudes and behaviors of both women and men (in other words, all of us). Once again, some of these changes are already occurring, although still at a very slow pace. For example, we are seeing the increased entry of women into leadership positions. And while some women simply adopt so-called “masculine,” “hard,” dominator styles of leadership, by and large women tend to bring to leadership a “feminization” of power. But we need to stress here that this happens not only because women often (though not always) bring with them what sociologist Jessie Bernard calls the “feminine ethos of love/duty,” but because the higher valuing of women (and with them of the “feminine”) also makes it possible for men to incorporate “feminine” attitudes and behaviors without feeling diminished as males.¹⁸

All of this brings us back full circle to the web of beliefs and images we have called the dominator myth, which has through recorded (primarily dominator) history served to socialize both women and men to fit into a basically unjust, violent, and imbalanced system that to varying degrees orients primarily to domination rather than partnership. For clearly a successful shift to a gylanic or partnership world will require fundamental changes in our myths about what is possible or “realistic” for us as human beings.

Because it is the task of scholars and scientists to continually reassess “reality” and “human nature,” and because scientific myths are today as important, and sometimes more important, than religious ones, this poses a major challenge to scientists and other scholars. Because we have become so accustomed to the dominator myth that we have no choices other than a dominator model of society, it is essential that we carefully reassess both our past and our present, and with this how we view human nature, and thus human possibilities and choices. For only through a fundamental reassessment of what was, is, and, most important, can be, will we meet the challenge of constructing a future society that takes into account the great flexibility and capacity for learning of our species.

This is where a more dynamic model of our cultural evolution—one that does not

“explain” human society in terms of a monolithic dominator model, but provides a viable gylanic or partnership alternative—can be of use. For if we continue through scientific as well as religious dogma to deny the possibility of fundamental change, we cannot realistically construct a better future—and thus may have no future at all.

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CHAPTER 9

Ideas of Cooperation and Struggle in the Chinese Philosophy, and Its Worldwide Significance

MIN JIAYIN

In the Chinese philosophy and even the Chinese culture the essential spirit is that of cooperation, unity, harmony and holism. We find both the idea of the cooperation of opposites, and that things which oppose each other are complementary, in the *Book of Changes* and in Lao Zi, two great sources of the Chinese philosophy.

The *Book of Changes* says that the sages “exhibited the Tao of heaven, called Yin and Yang; the Tao of earth, called Rou and Gang.” Yin-Yao (—) stands for Rou (weakness, softness and toughness), and Yang-Yao (--) for Gang (strength, hardness and brittleness). All things evolve from the pushing and rubbing together of the Yang-Gang and the Yin-Rou, two polar attributes opposing each other. The recessive meaning, however, is that the world is based on the cooperation of heaven and earth, monarch and subject, male and female.

Lao Zi said:

Therefor having and not having arise together.
Difficult and easy complement each other.
Long and short contrast each other;
High and low rest upon each other;
Voice and sound harmonize each other;
Front and back follow one another.

Here, what is emphasized is unity and mutual dependence of opposites.

With regard to cooperation, we can find an important idea in the Confucianism statement that “the most valuable is Her (和)”. In ancient Chinese, “Her” has several meanings including kindness, harmony, cooperation and union. In modern terms, it points to a unity based on diversity. The earliest appearance of this idea is in the first Chinese annals, *The Spring and Autumn Annals*. The king of the state of Qi is said to have asked his premier, a philosopher Yan Ying, about the right relation between a monarch and his subjects. Yan Ying answered that a cook must blend acid, pungent, bitter, salt and sweet flavors together in order to make a delicious thick-soup of fish. A conductor has to harmonize the distinct and the indistinct, long and short, fast and slow, the sad and the joyful, Gang and Rou, high and low pitches, the restrained and unrestrained voice, to make beautiful orchestral music. Consequently, a monarch should encourage his subjects to give air to their opinions on each matter, and then work out compromises with them. This is the right relation between a monarch and his subjects, which is called “Her.”

The idea that “the most valuable is Her” was formally put forward first in the *Analecst* of Confucius. Confucius said “Among the functions of rite and propriety, the most valuable is Her; which is the excellent quality in the ancient kings’ Tao; and in things small and great we follow it.” Here, the Her is the concordance among people in cooperative relationships.

Mencius elaborated further on the idea that “the most valuable is Her.” He said “Opportunities of time vouchsafed by Heaven are not equal to advantages of situation afforded by the Earth, and advantages of situation afforded by the Earth are not equal to the Her arising from the accord of Men.”

There is a city, with an inner wall of three li in circumference, and an outer wall of seven. The enemy surround and attack it, but they are not able to take it. Now, to surround and attack it there must have been vouchsafed to them by Heaven the opportunity of time, but they fail to take it because opportunities of time vouchsafed by Heaven are not equal to advantages of situation afforded by the Earth.

There is a city, whose walls are distinguished for their height, and whose moats are distinguished for their depth, where the arms of its defendants, offensive and defensive, are distinguished for their strength and sharpness, and the stores of rice and other grain are very large. Yet it is obliged to be given up and abandoned. This is because advantages of situation afforded by the Earth are not equal to the Her arising from the accord of Men.

This famous passage in the book of Mencius has had a long and deep influence, not only in China but also in Japan. The central idea of the contemporary business enterprise culture of Japan, for instance, is just that “the most valuable is Her.” In a thousand and one ways, a Japanese enterprise or company builds up good interpersonal relations between the higher and lower levels and among peers to strengthen its inner cohesiveness, and thus achieve efficiency and quality products. The Japanese in business, guided by the idea that “the most valuable is Her,” always like to consult with the opposite side again and again until a compromise is reached that satisfies both parties.

Before the Qin Dynasty, the last great master of the Confucianism, Xun Zi, holds that the characteristic by which humankind is superior to animals is that human can form a group based on division and cooperation. He wrote:

Humans are not equal to oxen in force, not equal to horses in running; but oxen and horses are used by humans. Why? The answer is that humans can form groups. How can this be done? The answer is division of labor. Why does the division of labor work? The answer is righteousness. So, basing a division of labor on righteousness produces Her; with Her the group becomes a whole; within a whole people are rich in force; with being rich in force they are strong; with being strong they are superior to other species.

There are Chinese idioms such as “the fire burns high when everybody adds wood to it” and “three stinking cobblers with their wits combined can equal the wisest Zhuge Liang,” that point to a similar truth.

In the Confucian classics cooperation is divided into two types: one is based on righteousness, the other is based on personal interest. The former is affirmed and the latter is negated. Confucius said “The mind of the superior man is conversant with righteousness; the mind of the mean man is conversant with gain.” So, “the

Master seldom makes mention of interests.” He also said “He who acts with a constant view to his own advantage will be much murmured against.” Recording the classics of Confucianism, some men cooperate toward ends of desire, money, power and influence. These are mean men who form cliques to pursue selfish interests. Such cooperation cannot last too long, for the participants will become estranged from each other with envy and hate, and even become enemies fighting at close quarters. Other men cooperate for a Tao-Yi (道义, righteousness) goal, a just cause. These superior men form cooperative groups that can stand the test of time and difficulties.

Besides having different motives, these two types of cooperation have different manifestations and different effects as well. The cooperators of the first sort show a surface relation as sweet as honey. But, in fact, being contrary-minded, each has his own axe to grind. They sleep in the same bed, but dream different dreams. We can't count on such cooperation as a potent force. The cooperators of the second sort show a surface relation as tasteless as water, but in fact cherish the same Tao, have a common goal, and can thus work together with one heart. They share weal and woe, and never change until death. This sort of cooperation can produce a tremendous force, by which a great cause might be brought to success. A saying in the *Book of Change* reads, “when two men are one in heart, they will be so strong that can break a metal,” or as a Chinese proverb “if all people are of one mind, the Mount Taishan will be moved away.”

The ancient Chinese philosophers offered some valuable ideas and principles regarding the way and method of cooperation. The key point is to judge others' feelings by one's own heart, and put others first. Confucius said, “The man of perfect virtue loves others.” “Wishing himself to exist, he also seeks to make others exist; wishing himself to develop, he also seeks to make others develop.” “Do not do to others what you do not want done to yourself.” Applying these principles to international relations, Confucius lays emphasis upon comity. He said: “Can we establish a country on the principle of comity? What difficulty will we have? If we cannot do so, what do we do with the rules of propriety?” In Lao Zi we also can find the idea that, regardless of the size of a country, each should put the other first, and modestly decline to each other. Only this way can both coexist peacefully.

In the field of social and historic philosophy, most ancient Chinese thinkers have a common idea: that the decisive factor is man. More specifically, it is what the people are for or against that decides the rise or fall of a nation, and the evolution of a society. From this point of view, the thinkers of Confucianism always exhort a monarch to practice Wang-Tao, the kindly way of government by justice, benevolence, righteousness and rites, and not to practice Ba-Tao, the cruel way of government by force, trickery, punishment and suppression. Practicing Wang-Tao wins the people's hearts, while practicing Ba-Tao loses them. In the end the country practicing Wang-Tao will triumph over the country practicing Ba-Tao. Mencius said:

A people is bounded in, not by the limits of dikes and borders; a kingdom is secured, not by the strengths of mountains and rivers; the empire is overawed, not by the sharpness and strength of arms. The monarch who gains the Tao has many to assist

him. The monarch who loses the Tao has few to assist him. When this—the being assisted by few—reaches his extreme point, his own relatives revolt from him. When the being assisted by many reaches his highest point, the whole empire becomes obedient to him. When one to whom the whole empire is prepared to be obedient attacks those from whom their own relatives revolt, what must be the result? Therefore, the true ruler will prefer not to fight; but if he does fight, he must overcome.

In regard to minority nationalities and the foreign enemy states, the Wang-Tao and Ba-Tao follows entirely different guiding principles. Practicing Ba-Tao is to conquer by force of arms, and to occupy, while practicing Wang-Tao is to carry out a policy of mollification and of pacification. Confucius commented: "If remote people are not submissive, all the influences of civil culture and virtue are to be used to attract them to be so; and when they have been so attracted, they must be made contented and tranquil." A Chinese idiom states "turn shield and spear into jade and silks," for in ancient China jade and silks were gifts exchanged between friends.

These ideas of cooperation in the ancient Chinese philosophy are concentrated in the Confucianist social ideal of a society of "Great Harmony," by which all within the Four Seas are brothers. Such a social ideal is also reflected in another important philosophic tradition, the Mohist School, where breadth of vision is expressed in the words "promote what is beneficial and abolish what is harmful in the world," and let all people "love and benefit each other."

These ideas have had great influence in the social development and history of China. For example, for many centuries China was the largest and most powerful state in Asia, yet China during those dynasties of practicing Wang-Tao by the Confucianist orthodox seldom embarked on outside conquest and expansion. On the contrary, it gave much attention to building up neighborly relations with nearby countries. It is true that in its history China launched wars to conquer Korea and VietNam, yet these were done mostly by short-lived dynasties practicing the Ba-Tao of Legalism. It is also true that the territory of China was enlarged by a factor of two to three times, yet this was done by the Mongol and Manchu, not by the Han nationality, which sincerely believed in Confucianism.

A unique aspect of Chinese history is that during a historic process beginning as far back as 10,000 years ago, from a beginning with two groups of tribes separately headed by Huang Di and Yan Di, both mixed together at the Huanghe River valley, China has, step by step, integrated 55 nations with various cultures into a single community. Today, this great family of nationalities has more cohesion and fewer racial, language, religious, and national problems than are troubling any other multi-national country. Such a situation, coming about through history, evidences the influence of the ideas mentioned above.

I'd like to adduce two typical examples to support this argument. In the period of Three Kingdoms, the wise Zhuge Liang, as Prime Minister of the Kingdom of Shu, led an army to do battle with a warlike ethnic minority inhabiting present day Guizhou and Yunnan. His army captured the ringleader, Meng Huo, many times, and released him by Zhuge Liang's order again and again. The seventh time Meng Huo was deeply moved, and led his army to pledge allegiance to the Kingdom of Shu.

Another example is a famous policy to attempt to cement relations with rulers of

minority nationalities in the border areas by marrying daughters of the Han imperial family to them. In the early period of the Tang Dynasty, Tibet witnessed its height of prosperity under the ruler of King Songzan Gambo. The emperor of the Tang Li Shimin married Princess Wen Cheng of the Tang house to Songzan Gambo. She took large quantities of silk fabrics, handicrafts, and farm tools with her to Tibet. Princess Wen Cheng benefitted Tibet and its relations with the Han so much that now she takes a deity position in the Temples of Tibet.

Discussing the ideas of cooperation in the Chinese philosophy, we should not overlook the negative effects produced from them as well. Benevolence, righteousness, friendship, and cooperation were so stressed that in many instances China was weak and easily bullied. It had a high degree of civilization, but often did not have armed forces powerful enough to defend it. Beyond its north border, there were more than ten nomadic peoples who were brave and skillful in battle. Each of them moved southerly and intruded into China. In order to resist such aggressions the Chinese built up the Great Wall, yet unfortunately, and not without a freezing irony, it kept none of them outside. And as a result, Chinese culture-social evolution suffered one setback after another. In modern times, the old and weak China became an object to be swallowed and carved up by the Western powers. Hence, the Chinese civilization drowned. These facts and experiences should not be forgotten.

Lost in both national and cultural crises, China had to save itself from subjugation, ensure its survival, and exchange the new for the old. It needed a powerful ideological weapon, but in its own traditional culture, in neither philosophies nor religions was such a weapon to be found. China had no choice but to seek in the ideological armory of Western culture, and try out the weapons one by one. The final and successful one was Marxism-Leninism, the sharpest of which was its dialectics, or more specifically the new philosophic idea of the “struggle of opposites.”

As stated above, in the metaphysical works of Confucianism and Taoism, the *Books of Changes*, and Lao Zi there are many dialectical elements, but not a conscientious dialectic, nor the idea of the “struggle of opposites.” It is in a work of Legalism, Han Fei Zi, that we find the following story:

There was man who sold spears and shields. Holding one of his shields in hand, he cried, “My shields are so strong that nothing can pierce them.” Then, he picked up one of his spears and shouted, “My spears are so sharp that there is nothing they cannot pierce.” The onlookers snickered at him, and one of them said, “So your spears are the sharpest and your shields are the strongest. But what if one should use your spears to pierce your shields?” The man could give no answer.

From this story comes a Chinese word “Mao-Dun” (矛盾 or Spear-Shield), which today is used to translate the English word “contradiction.” The ancient Chinese, however, did not have a dialectical proposition in the Western style, “the struggle between spear and shield, as two opposites, promotes the development of war arms.”

In Western philosophy, it was the Greek philosopher Heraclitus who first put forward both the concept of “opposites” and that of “struggle.” Regarding the world as a river, or as an ever-living fire, he said, “There is unity in the world, but it

is a unity formed by the combination of opposites." "All things come into being and pass away through struggle." "War is the father of all and the king of all." The first two philosophers who used a dialectic were Socrates and Plato. In them, the dialectic was a method of conversation or debate, by which philosophical truths could best be approached. Therefore, it was mainly a logical method as it was treated for a great many subsequent centuries in the Western history.

The comprehensive developer of dialectics was the German philosopher Hegel, who combined the objective and the subjective dialectics of Greek philosophy. In Hegel, dialectics is the method of logic by which he constructed his system of absolute Geist. On the other hand, he praised Heraclitus greatly: "Here, we make land; no proposition of Heraclitus has not been brought into my Logic." In his book we readily find such phrases as "Contradiction is a principle pushing ahead with the whole world." "Everything around us can be held as an instance of the principle of contradiction making progress." It needs to be pointed out, however, that the spirals of negation of negation, constituted with thesis, antithesis, and synthesis, as the kernel of Hegel's dialectics, was originally a mode of thinking intended to eliminate one-sidedness and a kind of nonlinear conception of development—and this is sometimes considered to be Hegel's contribution to philosophy. Meanwhile, we should notice that Hegel himself rightly pointed out that "if a philosophical principle is applied to reality directly, the latter will be broken." Unfortunately, just these two points, as you will read below, were ignored by later generations.

Hegel's dialectics were arbitrarily turned upside down by Marx in accordance with materialism. Therefore, the laws of subjective-spiritual development in Hegel's philosophical system immediately became the laws of the objective-material world. Marx did not give any demonstration; if anything, what we find in this writing is merely an expression of substance-monism which in itself still waits for a demonstration. "With us, on the contrary, the idea is nothing else than the material world reflected by the human mind, and translated into forms of thought." Unfortunately, he did not write a work to expound his materialistic dialectics, and thus left leeway for later generations to develop explanations as they pleased.

In his own books, Engels summed up the materialistic dialectics in three laws: "The law of the transformation of quantity into quality and vice versa; The law of the interpenetration of opposites; The law of the negation of the negation." He rightly pointed out that the law of the negation of the negation is the kernel of this whole process. But on the other hand, as he took from Hegel's complete system three separated laws (quite like the three laws in Newton's mechanism), he ran the risk of ossification, over-simplification, and one-sidedness.

Turning to the east, materialistic dialectics spread into Russia. Lenin took many notes when he intermittently researched philosophical books between 1895 and 1916. In these notes he took great pains to try to make clear the materialistic dialectics, producing three rules which summarized a new interpretation: (1) "Dialectics can be briefly set down as a doctrine about unity of opposites. By this way, the kernel of dialectics is grasped"; (2) "The unity (coincidence, identity, resultant) of opposites is conditional, temporary, transitory, and relative. The struggle of mutually exclusive opposites is absolute, just as development and motion are absolute"; (3) "Development is the 'struggle' of opposites." Lenin's

version of the dialectics is more suitable for class struggle, for class struggle needs such a change.

In 1933, Lenin's *Philosophical Notes* were published in the Soviet Union. Five years later Stalin wrote a famous booklet, *Dialectic Materialism and Historic Materialism*, in which he put forward new explanations. The most notable was not even to mention a single word about "the law of the negation of the negation," which is the kernel of the dialectics of Engels. And yet Lenin's idea that "development is the 'struggle' of opposites" is strongly emphasized. Consequently, human history is explained as a dialectic linear-process that runs through class struggles one by one.

In the mid 1930s, *Excerpts from Hegel's Logic and On Dialectics*, the most important parts of Lenin's *Philosophical Notes*, were translated into Chinese, and printed as two booklets and conveyed into Yanan. At the same time, a new textbook of dialectic materialism based on Stalin's booklet appeared in Chinese. On the basis of these, Mao Zedong wrote his own works on materialistic dialectics. Going in the same direction, but farther, he mentioned neither "the law of the negation of the negation," nor "the law of the transformation of quantity into quality and vice versa." So, his booklet is directly known as *On Mao-Dun* (On Spear-Shield or *On Contradiction*), in which the Lenin's three rules get a full elaboration and "the law of the unity of opposites" is reconferred and reemphasized as the kernel of the dialectics. And, at last, Mao summed up the dialectics in a sentence: "The combination of conditional, relative identity, and unconditional, absolute struggle, constitutes of the movement of opposites in all things." Since then, the idea the "struggle of opposites" has settled down with absoluteness in Chinese philosophy.

From this sketch we know that over a period of at least 2500 years dialectics was transmitted from Greece at the west end of Eurasia, through Germany and Russia, into China at the east end. During this process it changed time over time: from a method of looking for truth to the truth itself, from the development laws of absolute Geist to ones of objective world, from laying stress on the unity of opposites into one of struggle, from "a complete development theory without one-sidedness" into an incomplete one with a great one-sidedness, from a dialectic-nonlinear mode of thinking into dialectic-linear one.

Once such a mode of thinking was transmitted into China, especially after being simplified, popularized and Chinafied, it became a powerful ideological weapon that can be mastered by common workers, peasants and soldiers. It was a very sharp and suitable one in the class struggles, national liberation, and civil wars in China. And thus it helped the Chinese people stand up to fight and overthrow the rule of imperialism, feudalism, bureaucratic capitalism, and to found a new China.

Afterwards, in the mid 1950s, China would realize a strategy-shift from class struggle into economic development, from fighting imperialism to seeking foreign friendship and cooperation. According to his own dialectic-linear mode of thinking, however, Mao mistakenly directed China to carry on class struggles and fights against imperialism. While doing so, Mao made some new developments in his dialectics as well.

What is the news of his old age? He quoted a passage from Zhuang Zi, a Taoist classic, "There is a stick as long as one chi (about 1 meter). If you take half of it away each day, your work will last forever." As a conclusion he said, "matter is to be

unlimitedly split." So, by his opinion, a more popular expression of dialectics is not "two combine into one," but "one divides into two." And so he launched a movement to criticize the argument of "two combine into one" put forward by Yang Xianzhen, who was the president of the Senior Party School and had a closed relation with Liu Shaoqi. Mao insisted that "all contradictions are in principle irreconcilable," and "the only result of struggle of opposites is one annihilates another." He even created a new method of working: "set up opposites" and make them fight. For this reason, the world development process in conformity with the law of nature is to divide, divide and divide, fight, fight and fight. Any form of compromise and cooperation is a manifestation of opportunism and capitulationism. Dialectics had thus degenerated into its last vulgar form—"the philosophy of struggle."

This thinking brought great calamity to China and the Chinese people. On the basis of this philosophy Mao Zedong advanced his "theory of uninterrupted revolution," and that "revolution develops by stages." Since 1957 he had continually launched class struggles, inner-party struggles, critical movements and, at last, "the cultural revolution" in 1966. During a long 10 year period China landed itself in a full-scale civil war in disguised form: divided into two factions that fought against each other over the whole state and party and army, every factory and organization and school, and even every grade and class and family. From beginning to end, Mao Zedong had told his people that class struggles can promote economic development, and a bright red China will arise out of these struggles. Harsh reality, however, answered with an unhesitating negative. These man-made, unnecessary, and overdone struggles brought to China nothing but destruction and stagnation, and China fell further behind the developed countries. The standard of living in China was not raised, and the country approached the verge of economic bankruptcy.

At the level of world affairs, on the basis of the same philosophy Mao drew up a revolutionary line, "Struggle against imperialism, revisionism and reactionaries in all countries; make a clean sweep of ogres of all kinds." By this line China went to extremes in making enemies in all directions and thus became encircled ring upon ring. Finally, China was so isolated in the international community that its only friend was Albania.

Along with Mao's death his revolutionary line suffered a thorough defeat both in and out of China. His "philosophy of struggle" has died and became a philosophic mummy long ago. What momentous inspirations the contemporary world could draw from the ideas of cooperation and struggle in the Chinese philosophy and their successes and failures in social practices!

As to theory, cooperation is a mechanism of construction. In various new branches of systems theory we can find many specific forms of the manifestation of cooperative mechanisms. These include the self-organizing dynamics by which dissipative structures are formed, as revealed by non-equilibrium thermodynamics, synergetic phenomenon which is demonstrated to be of universal significance in synergetics, autocatalysis, cross-catalysis, closed catalytic cycles described in hypercyclic theory, and convergence and integration, all of which are discussed in general evolution theory. Thus, it can be seen that cooperation is an important, even leading mechanism in the whole process of matter, life, and social evolution.

Therefore, it is reasonable to think that cooperation should become a significant concept in general evolution theory, a concept taking a central position in world history. If there were no cooperation, the world would not exist. Just take human society as an example. In fact, every society is based on and developed by a cooperation of various classes within it. Never does a society—like the description made with the vulgar dialectics—have merely two opposed classes fighting against each other.

Struggle, on the other hand, is a mechanism of destruction and breakdown. It is also universal, and we can find it in various specific forms such as polarized fields, opposed properties and trends in the material universe, competition and natural selection in the kingdom of living things, and confrontations, conflicts and fights among states, classes, cliques, religions, and ideologies in human society. All of these forms of struggle are driving forces for evolution. If there were not the destruction and breakdown of the old, ugly, the evil, there would be no construction of the new, beautiful and good. For this reason, struggle is also a necessary mechanism and link in the process of evolution, but by no means the sole one carried on from beginning to end. The latter would cause a process of disintegration and regression.

For more than 100 years this world has sadly been dominated by the idea of the “struggle of opposites,” or more specifically “class struggle,” which was drawn out from Hegel’s philosophy by Marx. It divided the world into two big camps, and the cold war between them lasted for a half-century. During this period nuclear weapons were invented and produced, stockpiles of which can destroy the civilization on the earth more than 100 times over. Now the end of the cold war is here and the rift between the two big camps is being closed. The world is going over from a time of bipolar confrontation into a time of multipolar equilibrium, turning from the advocacy of struggle to the encouragement of cooperation. The difficulty evolving now is how to move from regional communities to globalization. Indeed, it is a time when new ideas of “multivariant cooperation,” and “global unity in cultural diversity,” are playing a leading role. But at just this time the thundering and booming of an aggressive war (Iraq is swallowing up Kuwait and making further threats against other countries) comes from the area of Persian Gulf, waking up mankind from a beautiful and happy dream of peace already come, and forcing him to face a new struggle, or even a gigantic war.

This is the first inspiration we draw from: we cannot place too much one-sided emphasis on cooperation, just as we cannot place too much on struggle. We must, by the original meaning of dialectics, “grasp opposites in the unity of opposites,” look for cooperation, yet not evade a necessary struggle. We must carry on struggle, yet only on just grounds, to our advantage, and with restraint.

The world of today is very similar to that of the Spring-Autumn and Warring States period in Chinese history. In other words, now we are living in the Spring-Autumn and Warring States period of the world. The central subject under discussion in that period was how does China move towards unity. Yet today the world is merging into an organic whole. So the teachings of Chinese philosophers in that period are significant for states and alliances of states today. Practice Wan-Tao; don’t practice Ba-Tao. The current meaning of Wan-Tao is to give service to the

highest interest of mankind, but not to a hierarchy-system under a globe-hegemony. And so, for any state or alliance of states, the seeking of hegemony, whether regional or global, economic or military, from a long-term of view is doomed to failure. It is an example to serve as a warning that the great First Emperor of Qin, though he unified China with Ba-Tao, retained his empire only for 11 years, and then it catastrophically collapsed. The final winner was still the Han Dynasty practicing Wang-Tao.

Contemporary sciences have revealed three levels of cooperative phenomena: cooperation in unliving nature, spontaneous cooperation in the living kingdoms, and conscious cooperation for moral and justice goals. The last sort is what is emphasized by Confucianism. And Confucianism's misunderstanding is due to the excessive depreciation of the third sort of cooperation, and going so far as to approach the negation of personal interests. But, even if in human society the most fundamental thing is still personal interest, the so-called "Tao-Yi" (morality-justice) of Confucianism is, in many cases, a goal that represents the long-term interests of many people in a large sphere. Its right understanding is that when the Tao-Yi conflicts with people's immediate interests, people should sacrifice the latter to the former. This point of view also has its worldwide significance. That not long ago the international community applied sanctions against a few countries who wantonly trod human rights under foot and suppressed democratic movements, and that the overwhelming majority of countries supported or took part in the blockade of Iraq, is an indication of a mature idea of cooperation, that is, to sacrifice immediate interests to a higher Tao-Yi goal.

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CHAPTER 10

It Happens by Itself: The Tao of Cooperation, Systems Theory, and Constitutive Hermeneutics

GUY BURNEKO

The question I've been turning over is whether we can look at the issue of cooperation nondualistically. I think we can; and I think it's worth doing—both to emphasize the inherently cooperative character of the processes of the universe and also to prise us away from our usual anthropocentric views on what cooperativity means. Moreover, when it comes to a discussion of the cooperative features of cosmogenesis, we are also, inescapably, coming to a discussion of the mutual and reciprocal co-production of things, and to the further question of an interpretive or hermeneutic ontology—one that is not founded on some entity, essence or other *primum notum* as has been the familiar case with Western philosophy up until, let's say, Heidegger.

In any event, in an admittedly rough, inadequate, and analogical (more than syllogistic) attempt to “think” cooperation holistically, I've relied upon the themes of Taoist philosophy, philosophical hermeneutics, some features of the myth of Hermes, and on the general approach of the theory of self-organizing systems as ways to help discuss in both imagistic and discursive terms the dynamic processes of “nondualized” self-organization—both in the larger cosmological context of our evolutionary matrix, and in the somewhat more social focus of the specifically interhuman dimensions of cooperation. In a provisional way, I'd like to propose on these bases that we might see cooperation as an aspect or mode of an ever-continuing psychocosmic self-evolution, and as a real-time mode of “ever-present origin.”

Of course, it's not easy to talk of cooperation without lapsing into dualistic language—separating myself as an “I” from “it” as a topic; and “you,” where are you in all this? Another objectified “it” with respect to my “I” and to the topic's own “itness”? Already, alerted the Taoist sage Chuang Tzu, we're calculating to infinity (Graham 56). Let's try some partially figurative language instead and see where it goes.

Having slept in the dark soil cold and dormant throughout the long winter, the life of flower bulbs in spring refreshes itself in a green garden urgency of earthy delights. Shoots and sprouts call tangled eager greetings to one another out of the sun-warmed dampness—and crocus and weed arise together as a lifetime previously they had together withdrawn from the frost.

This is all done, we marvel, without fuss or consultation; it happens all by itself: there are no plenary sessions or ideological misdoubts. It goes without saying; yet the whole event sounds to our ears as a concert of spontaneous harmonies, all

composing of themselves. And amid this renewed rippling and burgeoning of spring's fresh chaos is the interdependent self-organization of living things, each "self-trued" (Chinese *tzu jan*) in the shared vitality of the organic ecology we all compose around the one round earth.

And none of this happens in a vacuum. Though in a sense each organism simply remains true to its own nature, doing what comes naturally, yet in another sense, none of these blushing events occurs apart from a shared evolutionary mutuality with all the others, remote and near, that is ever-present and original, and that is ever-dynamic.

So it is that as we gaze upon the roses and the reeds, delighting in the ineffable perfume of life, our conscious witness of this happening is also the reflexive evidence of Gaia's evolutionary wholeness and of its most very minute inter-involvements. We are, in this respect, the consciousness of, and in, the unbroken ecology that becomes, through us, also an ecology of mind.

To the degree that we are, like the lilies of the field, self-true and dynamically inter-involved—i.e., spontaneous, whole, and holy—we make, as hummed the old sage Chuang Tzu, "spring" with all things (Wu, *Butterfly as Companion* 17).

I might clumsily philosophize here to suggest that it is the self-so-ness (*tzu jan*) of our being that is our spontaneous authenticity and creative intercourse. At the same time, our self-so-ness develops in the matrix of our being-together-with-others; and thus individuation is jointly or cooperatively co-produced amidst the concert of us all, and not by separate assertions of autonomy or conscious conation and planning or ego "centerism." Indeed, it looks very much like ego can come to be only in the plural: we participate entirely in one another's "social" and "existential" construction. Each ego—"I" is in its development always already "en'Thou'd."

This entirety of interrelation is so vast in its extent across cultural meaning and historical space and time that from a long anthropological perspective we begin to see in it but one large tissue of distributed life and cognition woven across the sphere of the earth. In all its flux of intensity and exchange, this noetic web is the ecology of consciousness—the field of consciousness of which each of us is a dynamic and reflexive node. And this field is most whole and healthy where there is the greatest range and delicacy of inter-responsiveness, where there is the least imposition on and restriction of spontaneous authenticity in mutual exchange. In this circumstance, we cooperate, and we cooperate in, the ongoing emergence and ever-present creativity of the evolving psychocosm. We are creatures participatory and inter-involved with and as the larger global and cosmic ecology that we incarnate, prolong, manifest and recognize.

But a philosophy apposite to such a "cooperatively" interrelational and processual dynamic must be similarly premised—it must be conscious of, if not altogether free of, the restrictions imposed by dualist, foundationalist, essentialist or substantialist and determinist assumptions and habituations. This is not only because we need to complement these reifying obstructions to our thought, but also because our thought is itself a constitutive mode of psycho-cosmo-genesis; how it is limited or liberated is directly related to the actual experience we have of the continuing creation, and thus, that it has of itself.

The wonderful interoperation of things objectivistically looked at from “outside” might seem like a great anthology of individual flowers engaged in a delectably prolonged cross-fertilization; but holistically felt from within its dynamic, it seems more like a mood, a continuous event-tone and, moreover, a mood irreducible to any one or several ego—“centers” that may claim to be “having” the “mood.” Again, the external view leads us to paradigms of things doing things (to or with other things); but the connatural sense of process, its self-feeling, is of there being experience, and yet of no deliberate doing or, for that matter, of any particular doer. Of and by itself does it all happen: the whole doing does not necessarily reduce to separate and objectified doers and doings and their (objectivistically oriented) “do-something” consciousness.

In this mood, we know ourselves less as deliberately interacting centers of identity consciously sharing a life-effort than as not-particularly-self-preoccupied, or maybe even as entirely self-(and ego)disinterested occasion/experience itself, i.e., as engagement, as “autotelic flow,” (in Csikszentmihalyi’s words), or as “awaring,” “verition,” “integrating” (in Gebser’s).

This is to be in the “flow” or the Tao, some of the ancient formulas concerning which are *wu-wei*, i.e., non-doing, action without strain or effort, or detachment from the fruits of ones deeds, or ecstasy, wisdom or grace. The terminology here matters less than the experience of a dynamic growth-space irreducible to any archaeology or center(s), of a colorful bouquet of mutually co-producing, increasingly auto-catalytic and cooperative patterns diffracted neither into “this” and “that” nor “mind” and “reality.”

Thus far, we have touched briefly upon the terms and themes of some very richly developed traditions and disciplines. A serious study of the phenomenology of cooperation could, it seems, conceivably compass all our learning; for it is, in its way, the species-specific of all evolving systems. It may even be seen as the condition—at least as the artifact—of processual phenomena on the one hand, and of interpretive/hermeneutic exercises on the other. These two, process and interpretation, may even be seen as being finally covalent. The process-patterns we find in nature and reality, and the methods of our various interpretive strategies may alike be seen as objectified or externalized (and partial or fragmentary) aspects in “nature” and “mind” respectively of what is “inwardly,” i.e., nondualistically, understandable and experienceable as an unbroken dynamic/continuum and as an autotelic hermeneutic or interpretive ontology whose “bottom-line” is not Stuff or Idea, not a metaphysical referent, but, rather, meaning, exchange and a self-reflexive pattern/process (of such a nature that even the notion “bottom-line” is meaningful as such only with respect to other interactive aspects of the meaning-process and not in itself.)

In still other words, cooperation is the name we may give to the overall inter-relatingness of “things.” This interrelatedness may be seen as less static than as processual; and any “thing” in this process is itself only by virtue of its interaction with others, all of them together cooperating one another’s simultaneous coming-into-being and meaning. This is nature, and this is reality. And mind is not other than this; for not only does it emerge in the dynamic of an evolving universe as, in

this regard, (a feature or phase of) its ontic behavior; but also, mind is cooperative with nature (i.e., nature is meaningful only as our collective mind “constructs” it); and it is neither entirely reducible to nature nor entirely separable from nature.

On epistemological grounds, the meaningfulness of either one of these categories is a function of *both*. One name for the mind/nature patternization-process thus characterized, then, is psychocosm; and it may be objectified as a self-organizing system whose apposite interpretive mode is that of hermeneutic dialogue and conversation. To rephrase this, we might say that it’s a more fruitful view of cooperation to see it as the interhuman eventuation of a creative hermeneutic and conversational ontology and, indeed, as a context for such ontology, than as the interaction of the reified elements of a reductive ontology of fixed essences and substances. Cooperation, in this view, is the mode of (self-)engagement of the psychocosm or *unus mundus*. It is this in both epistemic and ontic regards.

To reify and denominate cooperating elements of the interoperative process/field need not be to eclipse the understanding that these elements are differentiable only on the basis of their mutual togetherness in the process-that-is-also-interpretation and on the basis that in this togetherness they are definable, each as what it is, only reciprocally, in relation with one another and with mind which is not separable from the field/process at large.

It might seem excessive so unashamedly (and with such ponderous cadence) to make evolutionary nondualism the touchstone of our topic’s introduction, and perhaps even more so to have spoken of ego-disinterest as the complement to our experiences of cooperation: Does not cooperation in business, politics or science, we rightfully ask, involve the synchrony of many well-developed egos working according to their self-interest, plan and scheme for specific accomplishment? And this is a very good question. But the point of my raising it here is to suggest that I do not think the mainstream intellectual agenda of the past four or so hundred years have given an adequate answer.

To some extent—to some extraordinary extent—our sense of self, other, and relationship have all been flavored—or tainted—by the dualistically objectifying (and increasingly competition-driven) ideologies of the epoch. As Willis Harman noted in his *Global Mind Change*, “every knowledge system is shaped by [and shapes] the characteristics of the society that produces it” (27). Moreover, he notes with emphasis, “*every society’s knowledge system is parochial*—even modern science . . . and reality is perceived as conforming to [this] belief system” (28).

But apart from the background questions implied here as to whether the rise of modern philosophy and science recreated the rise of modern political and social ideology, and as to whether or not Darwin’s view of evolution, say, catered to the ideology of capitalism, the case remains that the positivistic and reductionistic thinking of recent generations has expelled us, as Berman has argued in his *Reenchantment of the World*, from an I-Thou participatory cosmos and reduced us to Its in a universe of indifferent Its. And the question now is not whether we had something better four hundred years ago that we should retrieve, but whether or not today we can achieve a view and experience of reality that is more apposite to its processual and interrelational dimension, to its cooperative and psycho-cosmic dynamic.

As cultural ideas change, so may the likelihood and characterizations of cooperative mutuality. So, perhaps by exploring this topic we may come to an expansion or intensification of global consciousness by coming to see where is the “intersection” of self and other in what, borrowing from the quantum physicist David Bohm, might be called the “holomovement” (Weber 26) of an evolving psychocosm. Once we begin to understand better the cooperative dimension of the processual-interpretive psychocosm and see its several enactments in co-definition, co-productive, co-meaning and co-evolution, etc., we already begin to realize its savor in our lives as the very attar of this garden of space-time delights, and as the nectar of creative evolutionary co-inherence.

In the realm of the interhuman and the social, neither do individuals construct themselves *in vacuo* nor do societies occur but as complexes of interpenetrating vectors and variables, none of which is entirely reducible to any other, and all of which are inextricably compounded in one another’s development. Moreover, as Wu Kuang-ming suggests in his admirable book, *Chuang Tzu: World Philosopher at Play*:

Things are “done” in their respective peculiarities. Everything is one as many, and the same in the fact of their mutual differences. When they are themselves, then they are one in being such. This oneness is the sociality which, far from dissolving individualities, depends upon them to obtain. Chuang Tzu alone has the radical sociality that is in nature (117).

This oneness may be understood as the inherently dynamic cooperativeness of thing-events which, far from submerging uniquenesses or homogenizing them, brings them forth as dissipative manifestations of a universe of mutually co-producing themes. This is to say that regardless of whether or not we view cosmogenesis (psychocosmogenesis) as “cooperative” in the anthropocentric sense, it is certainly cooperative from an epistemological viewpoint—first in the weak and minimal sense that there’s nothing “outside” of it that is not involved in it; and in any case, any definition of the “outside’s” character would be inevitably reciprocal, (i.e., cooperational) with the “inside’s.” But, second, in a stronger sense, anything that is an aspect or attribute of psychocosmogenesis is reciprocal with all else such, both by virtue of epistemic co-production in meaning, function and definition (e.g., “this” is meaningful as “this” only in (co-operant) relation with “that” which is meaningful as “that” only in relation with “this”; the meaning of each being a function of both), and also by virtue of the built-in cooperativeness in things through their collective ontological (or genetic or teleological) co-productivity or coherence (e.g., the common influence and ecumene of the Big Bang, or the implicate order, the Tao, deconstructionist *difference*, the *creatio continua*, Being, Gaia, etc.).

From this angle on cooperational characterizations of cosmogonic processes, Chuang Tzu’s and other Taoist apothegms on the dynamic stabilities of things in the oneness of their peculiarities sound analogous to the more up-to-date catch-phrases of a postmodern systems science concerning, for instance, our “co-authorship in the process of our own evolution” (Laszlo xv), wherein, “if there is sufficient diversity in the components and sufficient complexity in their structure,

the resulting system will have bistability or multistability” (Laszlo, 31). Also, from this perspective, “totalizing” ideas of the unity of all being become complemented and compensated by ideas of differential, disequilibrating and de-centering reciprocity. The world being somewhat fluid and paradoxical, given a dynamic reciprocity, so do our minds become in thinking it (thinking itself).

Moreover, there is an implicit ethic here: to come home to ones self-so-ness, (in the sense of realizing the authenticity and meaning of ones being and that it is inescapably interfused with the meaning of all else and of resting at home in this realization), is to experience the true cooperativity of socially-conditioned existence. We are most authentically ourselves where we are least preoccupied with being ourselves; and we are most authentically cooperative where we are least hung-up about being cooperative individuals—where we least feel consciously obliged by duty, prestige, neurosis, etc., to do or be something with or for “the other” as if “it” weren’t already a dynamic aspect and condition of our own “self” (constitution) to begin with: as if “it” weren’t already a “thou” and “self” a thou to “it,” each by virtue of both.

Observes Wu Kuang-ming in his recent book on Taoism, *Butterfly as Companion*, there is an existential lesson to be drawn here:

the True Man neither stores nor regrets things, but merely “things” things and harms neither things nor himself. He keeps his inner worth intact while changing with things, follows along with men without losing himself . . . responds spontaneously . . . never sticking to one course of action . . . letting [him]self be by letting others be themselves: . . . co-thriving is the way to co-selfing . . . natural response results in self-perfection (124–125).

Cooperativity in these reciprocal, dynamic and autopoietic respects is not the righteously ego-centered nor the dutifully other-centered attempt to do (well) together, but is the spontaneous letting-be-together of the already all-togetherness of a system-dynamic irreducible to any of its components. In allowing ourselves to conceive this or, more felicitously, to experience it from its inwardness as a nondual I-Thou mood-event rather than as an objectivized I-It or It-It affair, we also allow ourselves to enjoy its odor as the “trying without trying” that characterizes the genuine Self; and “non-doing-with” (*wu hsiang wei*) is an ideal togetherness where friends “do with others without doing with others” and thus let continue the general evolution of things (Wu, *World Philosopher* 24).

The key recognition here is the dynamically nondualist one that the I is always already othered, and the Thou is already being I’d—each is a function of both and, in this connection, void of self-subsistent entity or identity. Real liberation, and the liberty impeccably to cooperate, is the lived experience that these are not two. In those cases discussed by Csikszentmihalyi, for example, where “flow” is depicted as an experience of non-difference between doer and thing done, this applies more concretely. Where the dancers, lovers, pianist or rockclimber are entirely absorbed in the flow of their (non)doing, perfect cooperation is, (even more than being the epiphenomenal manifestation of) the very context and meaning of, their real-time evolutionary and nondual self-organization.

Among humans, this doing-together-without-conscious-striving-to-do-together,

the *wu wei* of “trying that is no trying,” (*World Philosopher* 91) is nondual play—a self-organizing and autotelic “spontaneous way of life” (93) free of “setting up a standard of what ought to be. . . . What destroys human autonomy, then, is ‘trying’” (94). “Obsessive conation,” concludes Wu, “drives oneself out of touch with oneself and with reality” (95). And, in the language of the late respected Erich Jantsch, consciousness can be equated with “that autonomy which a system gains in the *co-evolution with its environment*. . . . *openness towards novelty*. It does not suspend relations with the environment, but accentuates them” (296, emphasis added).

“In short,” reflects Wu in his *Butterfly as Companion*,

Things have two aspects—disparity and change The objective manyness of things depends on the subjective dynamism of distinguishing . . . and the subjective dynamism of existing opens out to (and dwells in) the pervading influence and confluence of the objective as-is. Here again, subjectivity and objectivity are in parity. . . .

In such a world we ourselves must enjoy ourselves swinging, sorting, and soaring within the realm of no-realm, that is, no definite distinctions (221).

An additional step towards possible integration of Eastern and systems theoretical reflections might come from the side of Erich Jantsch’ continued speculation in *The Self-Organizing Universe* wherein he notes that the “connectedness of our own life process with the dynamics of an all-embracing universe has so far been accessible only to mystic experience. In the synthesis, it becomes part of a science which in this way comes closer to life” (309–310). And similar conjunctions of insight come as well from disparate—and until recently unexpected—quarters illustrating Willis Harman’s and O. W. Markley’s point in *Changing Images of Man* (and the implicit point of this essay) that, “the emerging transformation of society seems to be proceeding by way of a diffuse network of interrelated influences, no one of which seeks to be a ‘central project’” (xx). As an additional instance, we might consider Jeremy Hayward’s comment concerning Herbert Guenther’s useful linkage of Tibetan Buddhism and autopoietic systems in the Foreword to Guenther’s remarkable *From Reductionism to Creativity: rDzogs-chen and the New Sciences of Mind*, where Hayward states that, “‘experience-as-such’ [is] the totality of a person’s being in the world not yet separated into mind, body, and environment [and is] a self-organizing system a dissipative structure, the translation of the Tibetan term *sangs-rgyas*, meaning Buddha” (x–xi). Or, to refer again to the Taoist tradition by which we entered the Secret Garden and, at the same time, to bring our reflections back to a specifically inter-human focus, Wu Kuang-ming suggests in his *Chuang Tzu: World Philosopher at Play* that the true self is “via its being-open (cognitively and conatively), an active co-creator and co-revealer of reality. The self is a phenomenon of life, an active phenomenology of truth” (104). In this expression of the issues, the twofold dynamic of the cooperational (reality-)process and of (interhuman constitutive) interpretation reappears as a complementarity in which the opposites include each other (Wu, *Butterfly* 224). And here, “a last dualism becomes dissolved,” says Jantsch, “understanding is not static knowledge, but itself an evolutionary process the need for meaning [is] a powerful autocatalytic factor in the evolution of human consciousness—and thus indeed of the evolution

of mankind and the universe" (309). Learning and evolution, interpretation and process, hermeneutics and ontology, thus fall together as the non-dual complements of the "self-actualizing" *unus mundus* or psychocosm that is at once Self and environment(al) Other: that which is process is interpretation; and interpretation is process.

Upon this speculative basis, a tentative heuristic congruence or equation can be proposed which reads something like this: the "active phenomenology" of truth \cong (non-dual cooperative and autopoietic) hermeneutic/processual self-organization \cong enlightenment/liberation (the Buddha-mind, *wu hsin* or "no-mind" in the Tao, etc.). Such an (admittedly simplistic) formulation would suggest that the path is the goal and that, as St. Francis is supposed to have said, "what we are looking for is what is looking." It also accords, moreover, with such thinking as Martin Heidegger's on the *Holzwege* of contemporary thought (something like what Chuang Tzu called "rambling without a destination"), and with Heideggerian *Gelassenheit* ("releasement") as an occidental complement to Chuang Tzu's and the Taoists' *wu wei*.

This sort of thinking and analogy-making is probably not familiar to strict adherents of one-sidedly foundationalist, dualist, entitative or static Aristotelian and Platonic outlooks, especially as these have come to be conventionally understood.

At the same time, however, moving from a reductionist representational-thematizing consciousness, (i.e., one static, reifying and objectivistic), to a creatively engaging self-organizing and self-referential experience, (as, for example, Guenther sees in the history of Buddhist thought), is not necessarily throwing out the baby of meaningfulness with the bathwater of a uni-vocal or "referential" *primum notum* (or bottom ontological/epistemological line) "to" which all things must be, indeed, "referred."

In recent years, first with Heidegger, then with philosophical hermeneutics and with various deconstructionist schools, again, to some degree, in symbolic anthropology, and, perhaps most refreshingly, in the work of Gregory Bateson (cf. his *Mind and Nature: A Necessary Unity* and Morris Berman's in his reading of Bateson in *The Reenchantment of the World*), we have seen that a conventional notion of foundational ontological "reference is the lesser part of meaning, [and] patternment is the greater" (Whorf 261). This is to suggest that a semiotic, a metaphysic or an ontologic need not be foundationalist or essentialist in order to be deeply meaningful. Conversely, the meaning of reality is not necessarily premised on its having a fixed, single, or immutable foundation.

Relinquishing the dualism implicit in all foundational "referential" and "representational-thematizing systems" (Guenther 1–8), we can now speak of an entirely hermeneutic ontology; and the whole significance of such thinking as that expressed in Heideggerian, rDzogs-chen, Zen, Batesonian and autopoietic terms can provisionally be seen to be largely in its prising us out of the view that reality is something other than our (here and now) consciousness/experience or that reality and mind must have some fixed external point of archaeological reference, noumenon, final terminus or localizable origin in contrast with their being existen-

tially understood and experienced together as an emergent articulation of self-organization and nondual autopoietic patternization whose “referent” or “condition” is not something above or beyond itself but is, if anything, (itself-)ing.

In this co-eventuating view and experience, any entity stipulated as point of reference, “transcendent signified,” *primum notum*, Platonic *Eidolon*, etc., is such only by virtue of its differential definitional cooperativity with any and all other such stipulated elements; (this is, in part, why Jacques Derrida is both great fad and enfant terrible in the academic community). Definitions of things, the expression of anything as foundational or absolute, discursive arguments on issues of primacy, validity, and so forth proceed by way of, and in a context of, other definitions, assertions, ascriptions, etc., which are themselves finally interlinked with those with which we begin. This is only a variant interpretation of Gödel’s Theorem; and it is indicating that any attempt to “establish” reality in a systematic way proceeds upon the bases of “unprovables.” But it goes beyond this also to suggest that apodictic “establishment” is not the issue at all; we do not establish reality; there are no separable “items” to establish; instead, what we do is conjugate it. And the conjugation is not simply effected among the words we use, but among things themselves, for none is what it is but in complement and contrast with others that are themselves similarly reciprocal in their meaning and function. It is this conjugality that is the cooperational aspect of words, things, and their intercourse.

The issue, then, is less one of meaning residing in self-subsistent things, propositions and ultimate reference than of meaning acting as and in the ungrounded process of differential relationship itself. This pattern-process involves mind, matter and ourselves—it is our selfing. Process, evolution and interpretation are correlated and cooperative themes in this characterization. Indeed, as Varela and Maturana have emphasized, everything said and known is said and known from some actual situation in which we escapably cooperate and participate, on no fixed ground or point of reference (240). In Chuang Tzu’s purview, everything is so from one standpoint and not-so from another (Graham 48–61); the interpretive “knack” of the sage (what contemporary philosopher Hans-Georg Gadamer might call interpretive *phronesis* (Hoy 55–61, Graham 6–7)) is to remain noetically and existentially pliant in this great transformation of the ten-thousand things that is also oneself.

Even in Western Platonism, to digress for a few moments on a tradition briefly alluded to above, there is a dynamic and processual dimension to be unearthed; and in R. E. Cushman’s excellent *Therapeia: Plato’s Conception of Philosophy*, it gets some attention. For Cushman, the significance of Plato (and moreso of Socrates) isn’t foremost in a Hegelian emphasis on the static (ideal) Ideas but in the fact that, as Cushman puts it, “Plato has no faith in borrowed findings, no faith in so-called truths which a man does not achieve for himself” (xvii). The realization of wisdom entails instead an active dialectical-dialogical engagement in, says Cushman, the *elenchos*, (or self-convincing by cross-examination and inquiry), rather than merely univocal demonstration. The significance of such dialectical engagement is “not so much to enforce a thesis as to discover one” because “for Plato philosophy is a way and a life, a way to a moment of existence in which there is direct confrontation with reality” (xviii). Moreover, to this emphasis on a dynamically conversational and

participatory engagement may be added Plato's conception that wisdom about (what for him would have been a nevertheless essentialist or foundational) reality "resists propositional status and cannot be corralled and contained Where man's relation to ultimate Being is involved, truth and reality are inseparable, for reality is embraced in immediate apprehension" (xviii). Here, as in Wu's reading of the *Chuang Tzu*, we find the philosopher-sage's "active phenomenology of truth" related to a nondual—at the least to a cooperational/dialectical—engagement with the reality process and not to a chaste abstraction of it.

This is, if we tease it apart from the static conception of the Ideal itself, a very dynamic and even existential depiction of the relation of minds to the real, to the "true"; and it suggests that the dialogical *maieusis* (the midwifing dialectic) of Socrates could be seen as an early attempt in Western philosophy to indicate the dynamic, the constitutive, and certainly the participatory, role of mind in the world.

Of course, such a claim would seem somewhat curious to scholars of Platonic thought. Yet we might revisit this thought in one of its more recent recensions in the work of Hans-Geroge Gadamer on philosophical hermeneutics in order more clearly to see the possible connection with the present argument. To do so, let's turn to Gadamer's *Dialogue and Dialectic* and consider it from the Introduction offered by P. Christopher Smith.

Smith tells us that in Gadamer's thinking, the success of live discussion (which is, in any case, often illogical) rests not in its syllogistic rigor but in the effectiveness with which it brings the subject matter to light and provokes the interlocutors to think further and achieve their own *elenchos*. In this view, good conversation is indeed a *con-versatio*, a change and exchange of situations and perspectives less in speech acts themselves than in a "play" in which we pliantly join; for language is seen here not as a tool we use but as something which precedes us to whose play (or flow) we submit and in whose play or flow we "empty" ourselves, as the old Chinese might say, of the objectifying fixities and habituations of our mentation. (cf. Wu on "goblet words" in *World Philosopher at Play*).

Gadamer is further interpreted by Smith to be suggesting that in whatever it is that we might philosophically establish foundations, essences, *archai* (first principles), ego, etc., a principle of unboundedness remains or intrudes; this is the *apeiron*. This "unbounded" that is everywhere in discourse might also be conceived, I suggest, as that irreducible *mundus*, that ecological congeries of things and of thoughts, that is the irreducible, the non-atomizable, cooperative context of the lifeworld. Additionally, since all our means and methods of knowing (especially where static and dualistic) inflect the things (and the larger psychocosm) engaged by them, continues Smith, following Gadamer, we must respect in all things and interpretations the "equifundamentality of the indeterminate two with the one" (xiii). Against the background of this always cooperative ontology and epistemology, any "One" that emerges is rather the whole (in its indeterminate and idiosyncratically reciprocal unboundedness) than a reduction to an atomic part or "essential" parts; the whole exceeds any totalization of the processual manifold of *atoma eidé*. And whatever logical primacy a particular idea or "part" may have is secondary to the ontological-hermeneutic field of cooperation that renders it expressible as such.

To the degree we can never come to a terminal overview of the whole in which we are involved and which is how it is as we constitute and are constituted by it, we find ourselves always underway, claims Gadamer, in a hermeneutic entirety of speaking and thinking which always exceeds the horizons of our perspective. Ascriptions of self-evidentiality, apodicticity, certainty and ultimacy are accomplished hand-in-hand with the noetic ecology of the *apeiron* expressive of the necessary inconclusiveness (the ever-continuingness) of world-construction, the *Unabschliessbarkeit* of speaking and inquiry, (*Dialogue and Dialectic* x–xiii, passim).

Additionally, as Cushman notes in his work, there is associated with the realization emergent through dialogical awareness a potent noetic *therapeia* in the form of a *metastrophe* or *metanoia*, a transformation of consciousness, “by which *nous*, the organ of cognition, is reoriented” (298). And in this sense, the earlier mentioned Taoist themes of self-truings, of inter-engagement and mutual cooperation and of authenticity in mutual inter-transformation—seen now in the Western idiom of dialectics and *elenchos*—return in the Socratic idea that, “the test of truth is not in being in agreement with others, however great the throng, but in being in agreement with one’s self—by being in accord with the soul that has kinship with divine reality” (Cushman 300). And positively to assert things about the nature of this reality is to return ourselves to square one; any such assertions are a function of the matrix of all assertions, assertability, and of the processual *mundus* of all events and ideation that is the lived domain of soul and soul-making: such assertions have no meaningfulness *in* hermeneutic or ontic *vacuo*.

In Wu Kuang-ming’s words on Chuang Tzu and the “divine reality” of the Tao in his *World Philosopher at Play*, this is to say, “in short, anything that is observable, conscious, and objective is static, abstract, and therefore an ossification. Life is, in contrast, always flowing, growing and self-transforming” (136). The ongoing and transformational dialogue among human beings and between them and nature/reality/history contributes autopoietically to, and works as the context of, the elaboration of the noetic web by which we cooperatively construct, constitute, and are constituted in and as the unbroken psychocosm. As Maturana and Varela elucidate, “consciousness and mind belong to the realm of social coupling” (234). And, they go on to say, the cooperativity of this constitutive hermeneutic/noetic of the mind/reality system does not reduce, any more than does the Socratic *maieusis*, to a concept or a specific point of origin: “we find ourselves in the co-ontogenic coupling, not as a preexisting reference nor in reference to an origin, but as an ongoing transformation in the becoming of the . . . world that we build with other human beings” (235).

This short excursus on the dialogical and therefore processual aspect of Platonic/Socratic philosophy has developed in the larger conjoint context of our consideration of the self-construction of nature and of our social construction of reality by self-organizing ontogenic couplings whose validity or “essence” abides not in the coupled and ramified elements themselves, i.e., not in their putative self-subsisting, nor in reference to a foundational origin—or necessary end—but in their mind/world patternings in mutual and recursive/reflexive implication and interpenetration through coproduction and comeaningfulness: i.e., cooperation, in all its hu-

man, humane and non-anthropocentrized senses. And yet again, true to the paradoxicality of a nondual experience, the world everywhere we think and do bears some image of ourselves.

Writing in an (at the time) unpublished manuscript, the phenomenological philosopher Angel Medina underlines one emphasis of this view by saying: "It could . . . be inferred that, in the absence of ultimate determinations inherent in the ground, the framework in which all beings are meaningfully collected is imposed by human existence upon its world."

Here, of course, Medina is emphasizing the hermeneutic and constitutive "ontology of communicative interaction" as realized by a humanity increasingly enjoying forms of life that "do not derive their orientation from the causal system of nature." But we may here also read him to signify that as mind emerges in the matrix of nature, and as nature is conjugated by mind, it continues the possible transformations of nature; and neither is (yet) independently definable or active apart from the "other."

Just as we may see the world of thing-events coproducing themselves into being, so too may we see a world of ideas and meanings arising altogether in their ever-mutual relevance and "conversation." The intersection of words and things, of reality/nature/mind, is the province of a processual interpretive ontology whose recognition is that shared meaning, rather than substance, is the "stuff" of life; for even the categories of substance, entity, etc., are themselves a function of a noetic/natural ecology whose extent and meaning cannot be reduced to entities and categories and apart from which things have no reality. Mind is a constitutive and even, claims Willis Harman in *Global Mind Change*, a causal factor in reality formation and realization—this we clearly know from studies in social interactionism, "the social construction of reality," and studies in cognitive psychology and symbolic anthropology. All that is new here is the suggestion that, viewed in the panorama of cosmic evolutionism, the two-fold process-of-nature and process-of-interpretation together, as the mind/reality psychocosm, manifests, thus, a psychocosmic and self-organizing *auto-maiensis*. The cooperatively emerging universe is a self-creating self-knowing Self. At the same time, the "one-ification" of the holarchically and reciprocally conceived elements and modes of reality formation (in and as the psychocosm) does not suffocate the *apeiron*, the scent of unboundedness, that, with Gödel's, Bohm's, Gadamer's, Derrida's, Varela's, Chuang Tzu's, Jantsch's and the work of others, might be smelled perfusing all the blooming and buzzing of experience just as (by other metaphors) butter is hidden implied in milk, or as a sphere of interminable extent has infinite centers.

Let's now consider the topic of cooperation further under the two-fold heading of hermeneutic *phronesis* and exosomatic evolution. Hermeneutics, of course, has to do with interpretation and especially with the processual/interpretive dialogue between the mutually constituting "knower" and the "known," while *phronesis* has to do with the "knack" of interpretation, according to Gadamer, with entering the always ongoing "hermeneutical circle" of knower-knowing-known and with knowing, according to Gebser, when to "do" and when to "not do" in the existential hermeneutics of a world that is an always changing self (Gebser 273). Through an appreciation of this interpretive and existential knack, we may now come to see

some additional significance in the hypothesized congruence between process and interpretation, to develop some ideas associated with the constitutive hermeneutics and interpretive ontology of a self-evolving psychocosm, and to develop in mutual amplification the images and sensibilities of Greek and Chinese mythology on the one hand, and sister speculations in systems theoretical models of “cooperative” reality formation on the other.

In order better to weave this garland of themes and notions, let’s look now at a myth and its meanings. It is the myth of Hermes: “friend of man,” “thief,” “guide of souls,” and “message bearer.” What we will come to see is that there is a definite crosscultural link between Hermes and the Tao, and this link is expressed in our own time in the more rationalized language and premises of systems theory, theory of self-organizing systems and in autopoiesis.

The story of Hermes is related in detail in Karl Kerényi’s remarkable *Hermes: Guide of Souls*, from which the following allusions have been taken. Hermes the God is a “speech-gifted mediator and psychagogue” sent by Zeus to humankind as a messenger to whom, beyond all other gods, “it is dearest to be man’s companion.” Hermes is *hermeneus*, interpreter, and this not solely on conceptual grounds. As Kerényi explains, “he is the begetter and bringer of something light-like, a clarifier . . . god of interpretation . . . led forward to the deepest mystery . . . [which is] articulated, play-related . . . enchanting language.” Hermes guides souls between the worlds of being and non-being, and brings them back. And as god of sudden chance and thievery (originally of Apollo’s cattle), Hermes is patron of synchronicity, of lucky finds, of the accidental “falling into your lap” of goods or insights, and of every sort of “evasion from the restrictions and confinement imposed by laws, circumstances, destinies” (4–91, *passim*). (In theory, we might see synchronicity as a key feature of psychocosmic constitution/interpretation; cf. Allan Combs’ and Mark Holland’s *Synchronicity* and Robert Aziz’ *C. G. Jung’s Psychology of Religion and Synchronicity*.)

Altogether, Hermes, as discussed by Kerényi, N. O. Brown, Combs and Holland, Lopez-Pedraza, Murray Stein, Ginette-Paris and others, connotes a liable, a liminal, an a-structural or antistructural, and an uncommonly fluid and “fluent” consciousness, one that “opportunately” passes or “sees through” the cosmos and rigidified conventional representations and thematizations of things, seizing from along and beyond their margins out of the unformulazible *apeiron* (or ecology of mind and reality) the new approach, the fresh act or insight, that surpasses, relativizes and challenges our usual noetic habituations and defaults. Hermes is always in motion, the “wayfinder,” a “way of being who is at the same time an idea” (Kerényi 4). Hermes the god of message, communication and interpretation is also the god of process and “currency.”

His cooperativity is evidenced most in his willingness and skill in taking what the world has to offer on the wing and abetting its processes rather than in making formal systems, intellectual templates, projections and edifices. Hermes makes-do, finds—or “steals”—what comes his way, and turns it, cooperates (with) it, to fresh advantage and meaningfulness; his is a *bricolage* of *randonnée* meaning and intelligibility. “The Greek word for windfall, *hermaion*, signifies that it belongs to Hermes” (Kerényi 24): with Hermes, “accidental discovery . . . becomes an Her-

metic . . . art" (25). The cooperativity of this is, additionally, "social" by virtue of Hermes' friendliness to humanity and his preference for new angles and attitudes rather than for violence and authoritarianism in problem solving. And Hermes is cooperative in being *eriounios*, the luck-bringer (79). Like a felicitously autocatalytic system and an autopoietic one, Hermes builds on any small find and fluctuation an emergent dynamic of relations, all themselves also in turn sensitively dependent on "initiatory" conditions. He makes it up as he goes along. In the crosscultural and contemporary idiom of Michel Serres' *Hermes*, this idea becomes the sensibility that thinks "of knowledge not in terms of order and mastery, but in terms of chance and invention (xxix) . . . the foundation of knowledge presupposes neither *one* philosophical discourse nor *one* scientific discourse, but only regional epistemologies" (xiv): these observations are well-complemented, in their turn, by such as Gaston Bachelard's in his *Philosophy of No*, Geertz' *Local Knowledge*, Wilden's *System and Structure*, and Kuhn's better known *The Structure of Scientific Revolutions*, or Hayden White's *Tropics of Discourse*.

But these "hermetic" attributes bespeak an even more far-reaching cooperative ontological dimension to Hermes, now to be seen less as a character amid a pantheon of deities than as a mode or way of being (a *tao*) of the psychocosm itself. The swift synchronicity or sudden interpretive opportunism of Hermes is something primordial, something of the "ever-present origin" discussed by Jean Gebser in his masterwork of the same title, and by Jantsch in *The Self-Organizing Universe*. "Crossing the threshold," "meeting and finding," "bestowing fortune" and "giving excellent gifts" from the "wider field of accidental happenings," are all of Hermes' function and activity. Hermes as noetic or psychocosmic mode is nascent, in contact with all not because all is rigidly organized and structured or because Hermes is a great systematizer, but because he is quicksilver, free and also engaged. The hermetic noetic engages with all because it doesn't get in its own way; or, to be more precise, because its way is the way of life itself; Hermes doesn't so much "vacate" his identity in order to enter into exchange with the identity of all, as he allows his identity and that of the world around him to compenetrates; like the Taoist sage, he changes with things and is thus unbesieged by them, is one with them, abreast of them: and in the spontaneous authenticity of his responsive engagement, he "rules" them by letting them be themselves; "doing" nothing, he leaves nothing "undone."

Hermes can touch, interpret, connect with and interconnect, can merge with, turn, swing, and pivot so well with so much not because his is a transparence devoid of attributes, but because, like process itself, Hermes is devoid of constant, fixed, substantive attributes; the personification of sheer process/interpretation and liminality with respect to fixed positions, Hermes flexes and pivots; he "flows" and dances easily, and readily, in all interactions and interoperations for being unattached to any one formulation, chreode or orientation. Hermes is the hinge of things and of his own way and so is able to trigger and to build upon any fluctuation and variable, at any cusp and point of disequilibrium, at difference and symmetry breaks, a fresh network of themselves also dynamic associations. Hermes is like nature itself and like mind itself in their self-organizational modes; laws and canons follow in the wake of what begins in unpredictability and (mutual) transformation or (self-)catalysis. Hermes is the god of autopoiesis and dissipative structure, of

catastrophe and bifurcation, of crossroads and crossing-roads, autocatalytic bootstrapping and the random variation of creative chaos. He is the god of process and self-organizing consciousness, of the ontological coproduction and epistemological cooperation of things and their always mutually ever-re-developing meanings.

Of the many epithets for Hermes, even more than that of “Trickster,” one in particular gathers together in imaginal form the polysemeity of the relevant themes (including, we shall see, some from the Taoist tradition). These themes range from that of the *unus mundus* of the psychocosm mind/nature/reality in all its creative implicate chaos to those of the unpredictable, the cusp, the bifurcation, and the autopoiesis of systems, and from the pregnant undifferentiatedness of the Chinese *hun tun* and the no-mind of the sage in the swift-seeing existential *opportunas* to the theme of self-truing interrelation in liberation from the neurotic restrictions and conditionings of “laws, circumstances, destinies.”

That epithet is Hermes *Stropheus* (Kerenyi 84), i.e., the socket in which the pivot of the gate moves—the hinge, the Janus-like entrance/exit and doorway, the empty center of the wheel, the fulcrum and empty middle about which (r)evolve life and death and life, words and the ten-thousand things, interpretations, positions, meanings, or perspectives. Hermes *Stropheus*’ is, as Wu Kuang-ming also says of Chuang Tzu’s *tao shu* or “pivot,” the “position of no position . . . soaring beyond others’ positions by sauntering among them” (*Butterfly* 6–7).

Hermes contrasted with Apollo, Chuang Tzu contrasted with Confucius, a self-organizing experience contrasted with an essentialist or determinist metaphysical representation, are “positions of no position” complementing, and even subtending, the orthodoxies of thought and behavior that always promote a definite position. This is not cynicism here, it is only a realization that identities, egos, unities, words and things are denominable as such by virtue of their reciprocal or fluidly cooperant intercourse; these are not self-subsistent items. Moreover, even to have said this much is to have put myself and you, the reader, outside them and thus to have made them (and ourselves) determinate objects to be discussed in fixed and determinate concepts.

The position of no-position remains existentially game for and inter-involved with here-and-now processes of reality such that our “moving” interpretations are not things apart from it. We are thus keeping the counterpoise to any ascription of ultimacy, finality or one-sidedness on the side of words or things, mind or nature. Our understanding/existence saunters among these, engaged with all because neither conceptually nor ontologically identified exclusively with any.

Writes Kerenyi of Hermes *Stropheus*, “the primordial mediator and messenger moves between the absolute ‘no’ and the absolute ‘yes,’ or, more correctly, between two ‘no’s’ that are lined up against each other In this he stands on ground that is no ground, and there he creates the way. From out of a trackless world—unrestricted flowing . . .—he conjures up the new creation” (77). Or, as the Taoists more laconically say, “the way comes about as we walk it” (Graham 53).

To a considerable degree, this is also the case we find in autopoietic models of life and cognition and in constitutive-hermeneutic theories of interpretation and meaning. What is the creation of autopoiesis in the “sensible” world of natural processes may be seen as the constitutive hermeneutics of meaningfulness in interpretation in

the “intelligible” realm. Both bespeak a hermeneutic ontology in that autopoeitic process and interpretive hermeneutic are standing on “ground that is no ground.” Or, we might say to refine this a bit, that the ground is always our own situation in all its conceptual and experiential ambivalence, paradox, and plurivocity. Write Maturana and Varela in *The Tree of Knowledge*, “we are unable to locate the starting point”; and they go on to say that, “we have only the world that we bring forth with others” (244, 248).

Expressed in the language of Hans-Georg Gadamer’s *Dialogue and Dialectic*, this is to argue not only that means of knowing, including insight itself, (not unfortunately) enter and introduce themselves instead of remaining “objectively” transparent to the things meant and explained, but also that we can never come to an overview of the whole with systematic “method” but always find ourselves “under-way” (xii–xiii).

To say that the world-making we know as ourselves-and-the-world is “cooperative” is to imply there is no foundational apodicticity to be derived from any of the cooperating elements; they are all reciprocally and mutually constitutive in their being and meaning. Only in the light of this (never complete) whole, perhaps, then, is there truth and ethical good; and it is (self-)realized more in the “mood” of flow and the “scent” of being than in logicized and conceptual abstractions of what, in any case, is never finished. The path is the goal. Moreover, given a radically cooperative or interpretive/processual cosmology and ontology, we can no longer give unquestioning credence to a strictly objectivistic method of knowing—itsself premised on a fixed and objectified *primum notum* or “essence” of things—but must rather see that interpretive understanding contrasted with objectivistic explanation (“flattening-out”) is the “more authentic” mode of engagement with one another and with a reality that is also a co-self-becoming “thou.”

We and the continuous creation are inseparably aspects of a common dynamic irreducible to either; one emerging, so emerges the other. In this *unus mundus* processual and hermeneutical psychocosm, consciousness is less an entity or a factor than the non-localizable hinge or pivot, the empty center, whose “patterns born amid formlessness” (Gleick 299) are the always cooperating reciprocals, the yin and yang, of spacetime existence, the major pattern-reciprocals of which are mind and reality. Not two, these are the differential and mutually differentiating aspects of a cosmic process that is also a (self-)interpreting. It is only where we put the decimal point, the pivot, that determines where the ontological and noetic weight will fall—and the “we” is not other than the world being self-construed and constituted.

Like a system entirely open to its environment and sensitive throughout to every variation of its com-positioning, Hermes Stropheus moves in labile freedom between the “no’s that are lined up against each other . . . and there he creates the way,” as too does Chuang Tzu the sage teach us that “where neither It nor Other finds its opposite is called the axis of the Way. When once the axis is found at the center of the circle there is no limit to responding with either, on the one hand no limit to what is *it*, on the other no limit to what is not” (Graham 53). Following Wu Kuang-ming’s extraordinary *Butterfly as Companion* on the *Chuang Tzu* and on its appositeness to the myth of Hermes and the myth of self-organization, we hear now of the Taoist “Pivot of The Way” or *tao shu* (175) as analogue to *stropheus* and to both

the secret of interpretive “knack” and of processual autopoiesis in a cooperatively conceived ontology.

In Wu’s understanding, Chuang Tzu is saying that,

to think things rationally is to see things in a heavenly (natural) wheeling of things arranging themselves democratically, a spontaneous system of ontological reciprocity Since dynamic self-arrangements among things make up the world, their *being*-arranged unmakes the world in confusion On the one hand, their *self*-arrangement bespeaks distinct non-collapsible identities of things. On the other hand, the fact that it is self-arrangement *among* things indicates that such arrangement obtains in their mutual interaction, to the extent of interdependence and interchanging of identities things mutually wait on one another, and are waited on by one another . . . to exist. All this illustrates a mutual *interdependence* among things ontological interdependence Therefore, Chuang Tzu proposes that the subject embody the Pivot of the Way (*tao shu*) of things’ mutualities. The subject must fit himself in the Pivot, fit the Pivot ‘in the center of the Circle’ (*huan chung*) of the world, and thereby respond endlessly and freely to things by ‘following along’ (*yin shih*) . . . and ‘walking both’ (*liang hsing*) ways—the way of things and the way of the subject (171–175 *passim*).

This sensitive accommodation to, integration with, and amplification or nurturance by and of the change and flux of the world strikes me as being, in its imagistic language, very much like the principle called “order through fluctuation” (Jantsch 10) whereby, Jantsch notes, “autopoiesis and evolution, global stability and coherent change, appear as complementary manifestations of dissipative self-organization . . . the dynamic system as a whole [in this case, the psychocosm] may . . . be understood as one gigantic fluctuation” (44). Elsewhere, Jantsch writes of the “wheeling interdependence” spoken of by the Taoists and the related notion of “pivoting,” that this entails: “the subtleness of tuning in to the multifaceted dynamics of an indivisible evolution . . . and a degree of aligning with the evolutionary processes which aims neither at total adaptation nor total independence. We may call this . . . evolutionary connectedness or *meaning*” (298).

In their way, then, these allusions together may indicate a nondualistic understanding apposite to a processual/hermeneutic psychocosm that includes the process-observer with the process-observed. Not only is the ontology of things thus conceived cooperative through their mutual conditioning and production, but so is their interpretation and meaning; interpretation in a cooperative and processual ontology creates, continues and conjugates realization pathways; it does not simply and externally seek to establish and verify them.

Interpretation, or meaning, is a mode of being in this case. In seeing and making the mind like unto the thing thought—both being mutually in-fluctuating and irreducible to twoness—the Hermeneutic-Taoist-Autopoietic purview gives license to reality as to mind. Writes Jantsch, as did Teilhard before him, “we have become the mind of a universe becoming increasingly aware of itself” (310). In this connection, philosopher Renée Weber takes mentor David Bohm’s ideas to heart and emphasizes in her *Dialogues with Scientists and Sages* that Bohm “proposes that *meaning is a form of being*. In the very act of interpreting the universe, we are creating the universe The word does not merely reflect the world, it also creates the

world.” This, continues Weber, “is the deeper message of [Ilya] Prigogine’s work” (18–19); and, we might reflect, of William Blake’s as well.

Again, we may see the reified dualistic objectifications of “things” as “punctuations” or “damping” of the self-organization process. Wu notes of our judgments and assessments in this area that “*that* and *no* emerge out of *this* and *yes*” (*Butterfly* 194). As the Janus “pivot of the way,” however, we can respond ceaselessly to their dynamic complementarity, and in the interpretive fluid grace of our engagement and response realize a more authentic engagement than is offered by a mechanical and abstract attempt at ontological “fixation,” categorization and reference; the being is in the patterns of meaning and is by them conjugated as beingness.

“Reciprocity and co-incident in time, space, and causal relation,” reflects Wu in *Butterfly*,

. . . is the network of things . . . we see things and judgments as interdependent, from which “differences” (‘division’ or ‘discrimination’) arise . . . Whether the door [of yes and no] opens or closes, the movements of the door are the *same* to its pivot-hinge. The pivot and hinge can be taken as having limitless *yes*’s and *no*’s. Whether swinging in one direction (‘yes’) or in another (‘no’), the swinging remains the same movement to the door . . . we can now afford to recognize-the-[autopoietic/hermeneutic]-“yes” . . . to . . . any situation, right or wrong, life or death (194–195).

Every cusp is a door; the dissipative structure an entrancement.

Life is, indeed, cooperative; it is, therefore, also multidimensional, polythetic, polysemous, ambiguous and paradoxical; and it engenders a noetic and interpretive mode apposite to its polysemy and irreducible processual paradoxicality. We are ethically invited by this realization to an acceptance of our cooperative condition and constitution and, thus, to an acknowledgment of the deeply and entirely holistic and conversational character of our conceptualization and experience.

The hermeneutic and existential knack by which we express and enact this acknowledgment is a sharing in an interpretive loop wherein each new interpretation and insight allows itself to be conditioned (not determined) by others while in turn feeding back new codes of meaningfulness to them. With respect to cultural or exosomatic evolution, these interpretations are most authentic where they are least fixed and are most concurrent with the processual aspect of reality-formation. The process/hermeneutic knack of *stropheus*, *tao shu* and the like is the aligning of ourselves with the dynamic grain of reality—and engaging its cusps and bifurcations in thought and experience.

We may find that one way to (non-)do this is through “mind-fasting” and similarly aconceptual resources that less reify, equilibrate or standardize the reality process and ego than manifest these in their full and conjoint plurivocity and disequilibrating immediacy. To (non-)think in this way is to cooperate with, in, and as the unbroken reality/process/interpretation. It is also, from time to time, not to think at all in our customary ratiocinations, representations and abstractions. To embrace reality and its unknowability is to be at home in the pivot of the active way of things (*Butterfly* 242).

With Wu, (and following also Nicholas of Cusa), we can also say that each event is a display of the entire interinvolved psychocosm in the manner of that particular

thing (*Butterfly* 243). An authentic interpretation “true” to the cooperative or holistic process/interpretation psychocosm might, and perhaps not surprisingly, be more a creative poetic than the familiar reductive metaphysic; and the knack of engagement more a dialogue with what William Blake called the “minute particulars” of reality than an abstract or objectifying pronouncement upon them. After all, where is the external standpoint from which we would pretend to a conclusive and apodictic viewpoint when, observes Blake, “man has closed himself up, till he sees all things thro’ narrow chinks of his cavern” (*The Marriage of Heaven and Hell*, plate xiv). Heaven is in the wildflowers.

Having played in crossculturally and interdisciplinarily imagistic form at a broader hermeneutic exercise in exosomatic *maieusis*, the mid-wifery of ever-different dimensions of meaning-as-being—all of this making itself up as it goes along without reference to some univocal ontological standard—we may now be at a place to see how the myth of Hermes Stropheus and the image of the *tao shu* achieve further amplification from, and in turn amplify the resonances of, contemporary systems science while with it articulating the evolutionary way coming about as we walk it, and as it cooperatively “walks itself.”

The various ways of suggesting the “mood” of the self-organizing hermeneutocosm (sorry) may be enriched by a reflection that this present view is of a reality that is interpretive in that we bring it into being; we evoke it, and we do this together with others; and it is also of an axiological cosmology in that this bringing-into-shared-being is also an I-Thou affirmation of the “other” who is inescapably ourself—and both are in continual and reciprocal process. Write Maturana and Varela on this point in *The Tree of Knowledge*, this is an ethics . . .

that springs from human reflection and puts human reflection right at the core as a constitutive social phenomenon. If we know that our world is necessarily the world we bring forth with others, every time we are in conflict with another human being *with whom we want to remain in coexistence*, we cannot affirm what for us is certain (an absolute truth) because that would negate the other person. If we want to coexist with the other person, we must see that *his certainty—however undesirable it may seem to us—is as legitimate and valid as our own* because, like our own, that certainty expresses his conservation of structural coupling in a domain of existence (245–246).

We might expatiate upon this in a context drawn, once again, from the “evocative hermeneutics” of the *Chuang Tzu* as understood by Wu Kuang-ming, who writes in his *Chuang Tzu: World Philosopher at Play*:

. . . what is inherently wrong is the very theorizing that is the reflexive self’s way of dominating the empirical. Such an internal conflict makes for an ontological rigidity of the self . . . the [authentic spontaneous] self is, via its being-open (cognitively and conatively), an active co-creator and co-revealer of reality. The self is a phenomenon of life, an active phenomenology of truth. . . . Subjective forgetfulness [i.e., “no-mind”] is an index to the comfort of the objective fit in the world . . . things are “one” in their respective peculiarities. Everything is one as many, and the same in the fact of their mutual differences. When they are themselves, then they are one in being such. This oneness is the sociality which, far from dissolving individualities, depends upon them to obtain . . . [in] non-exclusive togetherness. . . . Such is the Way of life in the realm of the Tao and its Virtue. In this live reflexive responding, one is letting oneself be by

letting others be themselves, and vice versa. Coming home to oneself results in a natural, nourishing mutuality. To be selfish is to co-mirror and co-thrive; co-thriving is the way to co-selfing . . . natural response results in self-perfection. . . .

To empty oneself is to become oneself; to become oneself thus is to go along with the world; to go along thus with the world of inevitables [and unpredictables] is to be free in it. Therefore, to empty oneself is to be free in the world (99–126 *passim*, and see also *Butterfly* 98–104).

From this Taoist syllogism the final transition to self-organization is this: in Jantsch' words, "an open state may be maintained only in a state of nonequilibrium [thus] there has to be exchange with the environment and the system renews itself continuously. Being and becoming fall together at this level. Dissipative structures constitute the simplest case of spontaneous self-organization in open evolution" (27).

To my mind, the Taoist premise is the premise of non-equilibrium dynamics and of dissipative noetics. The meaning of a self or an interpretive engagement open to the world is not other than its relational exchange with its "environment." In this sense, a static ego-ism is, like an invariant interpretive methodism, a "placemaker" for what is "in itself" devoid of self-subsistent nature or veracity.

By "going along with the world" in its concourse of fluctuations, by not needlessly setting an obdurate constancy against it and by not misreading our congealed knot of egoism as an ontological referent or fixed terminus (*a quo* or *ad quem*), the self is free in the world and *is* the world-self unfolding. The spontaneous self-so-ness (*tzujan*) of its freedom is the reciprocal of its non-doing, of its non-assertive, (i.e., non-scheming to protect an insular essence/foundation or preferred interpretation), dynamic self-coherence, in an environment of similarly non-doing selves that collectively "non-do" the universe in higher and different autopoietic regimes.

"To empty oneself is to be free in the world" as an infinitely labile, processual, flexible and authentic hinge of becoming susceptible to and opportunistically fertile of every fruitful moment of symmetry breaking and transformation. "A system is autopoietic when its function," says Jantsch, "is primarily geared to self-renewal" (33); and utter self-renewal is periodic immersion, argues Girardot, in the pregnant chaos of "catastrophe" and the *massa confusa*, the Humpty-Dumpty *huntun* of unpredictable flux, of the Tao that cannot be bounded or formulated (136-137). True stability is mutual and continuing exchange and transformation. States Herbert V. Guenther, "All this demands an entirely new understanding that switches from an examination of the parts of reality to reality itself as an undivided and indivisible whole, from being or beings to Being as it unfolds in its totality or spontaneity" as a "probabilistic ontology" (248).

If we were to engage the matter differently, we might say that in a world of "dialogical" interdependency, the small perturbations and quirks we rationalize as noise and glitches in the various kinds of systems around us are in mythological language the hermetic *opportunas* on which grows and by which is ever moved to fresh regions of meaning the genius of Stropheus. The Pivot of the Tao is, likewise, the everywhere present center of an interminate space of creative renewal and psycho-cosmo-genesis. The infinitely and minutely responsive "no-mind" of the hermeneutic sage, devoid of obstructive "self"-ascriptions of absolute definition and identity, is the register and co-evolving mode of a self-organizing realization

that is a way of life in our mutual self-construction that is also a co-self-interpretation. "We are a network of relations," hums the *Butterfly*, "in a round of existential conversations" (241, 22).

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PART THREE

Biological Roots

Issues concerning cooperation and competition often seem to address themselves to the biological level, Darwinian evolutionary biology in particular. Contrary to the traditional point of view, distinguished biologist Lynn Margulis and writer-theorist Dorion Sagan suggest an account of the evolutionary role of perhaps the most fundamental type of cooperation—symbiosis—as central to the formation of alliances between independent bacterial cells, alliances that led to the creation of modern cells and ultimately to complex multicellular organisms. Following this, philosopher Robert Augros and physicist George Stanciu present a well-documented account of cooperation as a common event in the world of nature. They also offer compelling explanations for the excessive historical emphasis on the role of competition. Their observations about animal behavior are corroborated in the essay by behavioral biologists Scott Carroll and Jenella Loye. In the last essay of this section, biopsychologists Jonathan Schull and Thomas Ilmanen develop a selectionist analysis of cooperation and sexuality from a sociobiological point of view. This latter perspective, though reductionistic and in this sense contrary to the spirit of the other essays in this section, represents an important alternative viewpoint in biology.

CHAPTER 11

Bacterial Bedfellows

DORION SAGAN and LYNN MARGULIS

Named for its flowing, ever-changing form, *Amoeba proteus*, a one-celled microbe with a nucleus, represents in its tiny body a whole modern tale of transmutation. A writhing, jellylike mass, such an organism probably inspired that genre of low-budget horror films exemplified by *The Blob*. In real life, amoebas are usually predictable creatures. So it came as some surprise to Prof. Kwang Jeon of the University of Tennessee when, upon looking through his microscope, he realized his amoeba collection was going through a major epidemic. Approximately 150,000 dots were seen in each amoeba, and each dot was a perfectly normal-looking bacterium. These bacteria had not been there before. Now they were growing inside the amoebas and killing off Jeon's collection. He picked out the least sick amoebas and kept a record of their progress over the next several months. Those that were apparently more resistant to the invaders returned to health and began growing by division at almost their former rates. Jeon examined these survivors and found that each still contained the foreign bacteria but far fewer of them—some 40,000 in each amoeba. Had *A proteus* somehow transmuted, incorporating the invaders into its own system? Had infector and infected merged?

To the question, "Can the nucleus of the amoeba cell now live without the formerly pathogenic bacteria?" the answer turned out to be "No." When Jeon transplanted the nuclei of infected amoebas to amoebas lacking the bacteria, the hybrid amoebas died in about four days. Yet if at the very last moment he reinfected these hybrids with the once-lethal "parasites," the amoebas revived and grew. Today, the mutual beings are alive and well and living in Knoxville, Tennessee.

Jeon caught evolution in the act. What is more, the evolution of a new organism occurred by symbiosis, not by an accumulation of mutations. Furthermore, the new amoebas evolved not over millions of years but in eighteen months, which geologically speaking is instantaneous. Natural selection eliminated not competitors but competition itself. After the smoke had cleared, only symbionts—bacteria and amoebas that could work and live together—survived. (We should not be surprised. The deadliest parasites destroy not only their hosts and habitats but also their own chances for continued survival.)

Jeon's tale of two microbes hints at the answer to a major evolutionary puzzle. Of all the missing links in evolution none is more profound than the gap between eukaryotes, cells with nuclei, and all bacteria, which lack nuclei. The difference between bacteria and any nucleated cells makes the difference between people and apes look negligible. Plant and animal cells have far more in common than do bacteria and nucleated cells. Cells with nuclei contain up to a thousand times more

genetic material than their smaller relatives. This material is tightly coiled into chromosomes that are contained in a membrane-bounded nucleus.

Nucleated cells divide by a complex “dance of the chromosomes,” during which the chromosomes pull the hereditary material to opposite ends of the cell and then divide. Bacterial cells simply split apart: they don’t form chromosomes. They indulge in a wide range of metabolic variations, consume nitrogen and sulfur, produce methane, precipitate iron and manganese while breathing, and grow in boiling water and brine. Bacteria obtain their food and energy by using every sort of plant fiber and animal waste. If they did not, we would be living in a mounting heap of garbage.

A microscopic look at the waters of the earth of the Proterozoic eon 2,500 million years ago would have revealed flotillas of bobbing purple, blue-green, red, and yellow spheres: colonies of organisms crowding on rocks, gliding on water, or darting about with whipping tails. Shoals of bacterial cells waved with the currents, coating pebbles with brilliant hues. Bacterial spores blown by breezes showered the muddy terrain. Their genetic material, DNA and RNA, was not bound up; their genes were not packed into chromosomes wrapped by a nuclear membrane. They reproduced asexually by growing to twice their size, replicating their single strand of DNA, and then dividing, with one copy of the DNA going to each offspring cell. Or a small cell containing a complete set of genetic material budded on the parent and then broke off. They also encased their DNA in spores that survived long periods of dryness, waiting to come alive when conditions became wetter or more generally favorable. By 1,500 million years ago, the earth’s modern surface and atmosphere were largely established and the bacteria flourished. Microbial life permeated the air, soil, and water, recycling gases and other compounds as they do today.

From this low-lying milieu came new forms of life. A new kind of cell formed, larger and more complex than bacteria. This cell had circuitous channels of internal membranes, including one enveloping the nucleus. It had parts called mitochondria: dark bodies providing the cell surrounding them with energy derived from oxygen. Some would soon have plastids, chlorophyll-bearing packets capable of photosynthesis, suspended in their cytoplasm.

What brought about this new cell? As with other evolutionary puzzles, the solution to the mystery of the origin of the nucleated cell lies first in the circumstantial evidence. History must be reconstructed from clues. If the ancestors of mitochondria were themselves bacteria without nuclei that raided and reproduced inside their hosts without killing them—in a fashion similar to Kwang Jeon’s “dots”—an ancestral line of complex cells could have become established. There would be no record of transitional forms because the new entity would have evolved rapidly, the result of interspecies merger.

Imagine the ancestor of the mitochondria: a bacterial attacker, capable of breathing oxygen or even doing without it when necessary. Such microscopic predators still exist. *Bdellovibrio* (the Greek *bdello* means leech; *vibrio* refers to their vibrating comma shape) burst asunder bacterial prey, eating them from the inside out. *Daptobacter* (the “gnawing bacterium”) enters both the inner and the outer mem-

branes of its victim's cell walls. Then it divides, again and again. The mitochondrial ancestor's original prey may have been a larger bacterium like modern day *Thermoplasma*. The DNA of *Thermoplasma* is unlike that of other bacteria and similar to that of eukaryotes. This rugged bacterium can survive very hot and acidic water such as that found in the hot springs of Yellowstone National Park.

When they were first invaded, occupied hosts like *Thermoplasma* probably couldn't survive, and when they died, they took the invaders with them. Eventually, some of the prey evolved a tolerance for their aerobic predators, which then remained alive and well in the food-rich interior of their hosts. As they reproduced inside the invaded cells without causing harm, the predators gave up their independence and moved in for good. The two organisms thrived on internal leftovers—the products of each other's metabolism. Invaded victims and tamed mitochondria recovered from the attack and have lived ever since, for 1,000 million years, in dynamic alliance. Because of the mitochondria, all earthly beings made of nucleated cells—which includes fungi, plants, animals, humans, and all organisms except bacteria—have remarkably similar metabolisms.

The presence of DNA in mitochondria helped tip off scientists to the possibility that these cells used to be free-living bacteria. When this DNA was examined, it was found to resemble the DNA in certain free-living bacteria far more than it resembled the DNA in the nucleus of the cell from which the mitochondria had come. Mitochondria have their own genes, their own reproductive timetable, and they often divide out of step with the rest of the cell. The bacteria that became mitochondria in our cells can be thought of as raiders that took over their hosts and formed cells with nuclei—cells ancestral to every plant and animal on the planet.

If we know where to go and how to look, we can see that these kinds of mergers are still occurring today.

In a scene from a beautifully colorful silent film called *Intimate Strangers*, Oxford University botanist David C. Smith stands on a beach on the Brittany coast of France. Beneath his feet is what appears to be seaweed. But as Smith begins stepping on the spinachy green matter, it squirms straight down into the sand. Very soon all that's left is a cleared patch of beach.

Where did it go? Actually, "it" is "they." *Convoluta roscoffensis* are flatworms within whose translucent bodies live grass-green algae. Annoyances to bathers, they long baffled biologists. The flatworms and algae have merged into a composite creature. They lie in dense green masses on the shore, and instead of eating, make their own food from sunlight and air. They resemble plants until bothered by pounding surf or a predator, at which point they burrow for cover. The algae not only live inside the tissues of the flatworm and produce food for it but also recycle the worm's waste products, such as uric acid, into additional food. Due to this symbiotic relationship, adult worms do not have to eat and their mouths remain permanently closed.

Symbiosis—the living together in intimate association of different kinds of organisms—is more than an occasional oddity. It is a basic mechanism of evolutionary change. Some plants and animals would long ago have become extinct were it not for the help of their partners: blind shrimps are led around by sighted fish, flowering plants need to be pollinated by specific insects, cows and other ruminants

cannot digest grasses without the aid of gut bacteria. Humans also need live bacteria in their intestines. We have trillions of animal cells—and ten times as many bacterial cells.

Although many plant and animal symbionts are known, symbiosis and its fundamental role in evolution really become conspicuous in the microcosm.

Perhaps a hundred million years after mitochondria had become established, a new type of organism joined them in the cytoplasm of certain cells. But the genesis of the union was not through infection but ingestion. Like Jonah swallowed by the whale, the forebears of the photosynthetic parts of nucleated cells were engulfed by larger bacteria but, far from being destroyed, found shelter within, resisted being digested, and kept their valuable light-trapping pigments alive. Today, locked inside every plant, these organelles, or plastids, make food from water and sunlight. Chloroplasts are green plastids and are even larger and more like bacteria than are the mitochondria. Plants turn toward sunlight because without it the plastids within would die.

Plastids provide the biosphere with food and oxygen. From a planetary point of view, the major role of mammals may be as fertilizers of plants and carriers of mitochondria. But if all mammals were to die in one instant, insects, birds, and other organisms would carry mitochondria and fertilize plants. If plants with their plastids were to suddenly disappear, the output of food on the planet would be so severely hampered that all mammals would certainly die. A cell that didn't exist before would soon become indispensable to future generations. The new evolving cell now had mitochondria for oxygen metabolism and plastids to provide food. Both were the products of bacterial mergers. The question that remains is whether the cell's ability to move—even within its own cell wall—is the product of yet another symbiotic merger.

If you look at a living eukaryotic cell under the microscope, you may be startled by the vigorous movement within it. In sharp contrast to a bacterial cell, whose contents are motionless or drift passively about, the interior of eukaryotic cells is swarming like a city. The cytoplasm streams. Many cells rhythmically expand and contract. For example, in a chameleon that is changing color, particles of pigment are carried from the surface to the interior of cells when the animal's skin becomes lighter.

We believe that cellular motion by nucleated cells may be the result of a symbiotic merger between still other kinds of bacteria: rapid, whiplashing bacteria called spirochetes. Close study of the tiny cell whips on many kinds of cells with nuclei shows an amazing uniformity. These filaments have traditionally been called flagella if they are long and few like sperm tails, or cilia if they are short and numerous like hairs. Since there is no basic difference between them, they are all called undulipodia. Nearly all algae and ciliates—the earliest organisms with nucleated cells to have evolved—have them. We are currently exploring the idea that undulipodia come from spirochetes, among the tiniest, fastest, most mobile members of the microcosm.

Shaped like corkscrews or bits of fusillini pasta, spirochetes thrive everywhere, from garden soil to people's gums. Some use oxygen; others are poisoned by it. They tend to attach to things, living or not. They form a major part of the microbial

community that lives inside the swollen intestines of termites. There they can be seen attached to and feeding at the surfaces of larger organisms.

When, 2,000 million years ago, an organism with spirochetes propelling it found more food and reproduced more often, natural selection would have favored the alliance. A certain modern amoeba, for example, that draws in its whiptail and gorges itself when food is plentiful, grows a tail when food is scarce in order to swim in search of a meal. The advent of spirochete alliances would have altered the microcosm, leading to the first animal cells—a sort of symbiotic *ménage à trois* formed of *Thermoplasma*, mitochondria, and spirochetes. Plant cells may also be multispecies assemblies, composed of these plus plastids.

Proving the spirochete connection is difficult. As bacteria merge, promiscuous genes ultimately blend, and it becomes very difficult to sort out the original partners. The integrity of individual partners is sacrificed to the formation of a new cell. As Smith puts it, what remains after the living merger, after billions of years of life within a supporting living habitat, is only the smile of Lewis Carroll's Cheshire cat: "the organism progressively loses pieces of itself, slowly blending into the general background, its former existence betrayed by some relic."

New techniques of molecular genetics confirm that parts of organisms dwindle within the life support system or other living cells. Bacteria can donate and receive varying numbers of genes, not only from each other but also from viruses and cells with nuclei. The free transfer of parts and pieces of living things from one area of a cell to another may explain how symbiotic organisms became streamlined into mere semblances of their former selves.

The malleability of microbial life is exploited by genetic engineers who identify proteins they want to produce in large quantity, such as human insulin, and put the genes for them inside bacteria capable of rapid and prodigious reproduction. Not to belittle the human effort, it is worth pointing out that bacteria have been using "genetic engineering" techniques—transferring genes among themselves for their own purposes—for billions of years.

In the traditional view of a cutthroat Darwinian world, merged life forms have always seemed a bit odd, aberrations from the law of the jungle that the poet Tennyson characterized as "red in tooth and claw." Yet it now seems plants and animals never would have evolved at all were it not for attacks and defenses followed by symbiosis and reciprocity. Uneasy alliances are at the core of our very many different beings. Individuality, independence—these are illusions. We live on a flowing pointillist landscape where each dot of paint is also alive. Earth itself is a living habitat, a merger of organisms that have come together, forming new emergent organisms, entirely new kinds of "individuals" such as green hydras and luminous fish. Without a life-support system none of us can survive. It is in this light that we are beginning to see the biosphere not only as a continual struggle favoring the most vicious organisms but also as an endless dance of diversifying life forms, where partners triumph.

CHAPTER 12

Competition and the Enculturation of Science

ROBERT AUGROS and GEORGE STANCIU

INTRODUCTION

In modern Western culture you do not have to offer proof to get people to agree that nature is competitive. Indeed, no evidence at all is necessary, no distinctions required, no objections need be answered. The claim that competition rules nature is received as a gratuitous axiom, so obvious and so fundamental as to render all opposition futile. Yet despite these formidable obstacles, we intend to argue that competition is not nature's paradigm.

To begin, a good many ecologists maintain that the competition model does not square with observation. Ecologist Daniel Simberloff (1984) declares, "It is rare to see two animals, particularly animals of different species, tugging at the same piece of meat. And even when competition is observed, it often appears inconsequential. Perhaps a fiddler crab scurries into a hole on a beach only to come running out again, expelled by the current inhabitant. But the crab simply moves off to find another hole. Competition between species—interspecific competition—thus appears to be little more than a minor, temporary inconvenience."

In the same vein, entomologist P. S. Messenger (1979) writes that "Actual competition is difficult to see in nature." Ecologist E. J. Kormondy (1976) asserts that competition in natural conditions is rare. And biologists Allee, Emerson, Park, Park, and Schmidt (1959) in a collaboratively produced text declare, "Instances of direct mutual harm between species are not known to us."

Now we do not expect these authorities to overthrow a widespread deeply-held conviction. Consequently, we will present a detailed account of the evidence against the competitive model. We suspect that the reader still may not be convinced by this presentation, whatever its rigor, scope, and clarity. We offer it merely as a necessary step toward discovering the true source of competition as an *idée fixe*. Let us begin, then, with an examination of the means nature employs to forestall competition.

NATURE PREVENTS COMPETITION

Geographical isolation is the first and easiest way to prevent two species from harming each other. In 1876, Wallace distinguished six biological land realms on the earth, each characterized by plants and animals unique to it and that naturally occur nowhere else. Wallace's six realms, roughly corresponding to continental

divisions, are still valid and recognized by biologists today. Hundreds of miles of ocean or vast deserts or huge mountain ranges like the Himalayas isolate the six realms from each other, effectively preventing competition and allowing the earth to support a much richer diversity of animals and plants than it did before the continents were separated from each other.

Similar species living in the same habitat avoid competition by dividing the habitat into ecological niches. The habitat is where an organism lives; the niche is its profession. The presence of one species no more harms another species with a different livelihood than “the practice of a doctor harms the trade of a mechanic living in the same village,” to use a comparison of Konrad Lorenz (1963).

Perhaps more firmly established than any other principle in the science of ecology is the dictum that two species never occupy the same niche. Each plant species, for example, occupies a distinct niche: some specialize in sandy soil, others in rich humus; some prefer acid soil, others alkaline; still others require no soil, such as the lichens; some exploit the early growing season, others the late; some get by only because they are tiny, others only because they are huge. Plant physiologist Frits Went (1955) writes: “In the desert, where want and hunger for water are the normal burden of all plants, we find no fierce competition for existence, with the strong crowding out the weak. On the contrary, the available possessions—space, light, water and food—are shared and shared alike by all. If there is not enough for all to grow tall and strong, then all remain smaller. This factual picture is very different from the time-honored notion that nature’s way is cut-throat competition among individuals.”

One of the simplest ways animal species avoid competition is food specialization. Along the shore of Lake Mweru in Central Africa, three species of yellow weaver birds live side by side without struggle. They do not fight over food, since one species eats only hard black seeds, another eats only soft green seeds, and the third only insects (Colinvaux, 1978). Many caterpillars will eat only one kind of plant. Twenty different insects feed on the North American white pine without competition because five species eat only foliage, three species concentrate on buds, three on twigs, two on wood, two on roots, one on bark, and four on the cambium (Farb, 1969).

Spatial division of the habitat often suffices to prevent competition. Five species of cone-shelled, carnivorous snails live segregated from each other in five parallel strips along the shores of Hawaii, where within each strip each species attacks with poison darts a unique group of prey (Colinvaux, 1973). The niche of many freshwater fish is circumscribed by their oxygen requirements. Catfish can inhabit the lower, slow-moving regions of a stream where there is little oxygen but brook trout, which require much more dissolved oxygen, can live only where the water is aerated by rapids and waterfalls. Similarly, estuarine animals have differing tolerances for salinity. Thus the clam does not compete with the mussel because it cannot live in the same places. The space that defines a niche need not be large or far away from others: three different species of mite occupy three different areas of the honey bee’s body as their niches (Curtis, 1968).

Another strategy nature uses is dividing the habitat according to time. Most habitats support two ecological communities, the diurnal and the nocturnal. During the day, bees, butterflies, weasels, most lizards, and most birds are active. At

dusk they retire and the night shift takes over, including cockroaches, moths, mice, bats, and owls. Moths feed on white or pale yellow flowers that open only at night, thereby avoiding competition with bees and butterflies.

Periodic migration also allows similar species to escape struggling over resources. For example, the white storks and the black storks that winter in Africa spend the rest of the year in Europe. They “thus have avoided competition with their tropical relatives, not by radiating into unique food niches but by leaving the area,” says zoologist M. Philip Kahl (1972). Other animals that migrate—some as far as twelve thousand miles—include caribou, bats, whales, birds, dragonflies, butterflies, fish, eels, and turtles. The migration strategy is not open to plants, of course. Flowering plants avoid interspecific competition for pollinators by flowering sequentially, each species in its turn.

The niche principle is so universal in the plant and animal kingdoms that it has become a principle of prediction and discovery for field studies. Paul Colinvaux (1978) writes: “Whenever we find rather similar animals living together in the wild, we do not think of competition by tooth and claw, we ask ourselves, instead, how competition is avoided. When we find many animals apparently sharing a food supply, we do not talk of struggles for survival; we watch to see by what trick the animals manage to be peaceful in their coexistence.” Colinvaux (1978) concludes that “Nature is arranged so that competitive struggles are avoided,” and adds that “peaceful coexistence, not struggle, is the rule.”

With each species in its own niche doing its own task, fights between animals of different species are exceedingly rare, if they occur at all. Lorenz (1963) after many years of studying fish remarks, “Never have I seen fish of two different species attacking each other, even if both are highly aggressive by nature.” Colinvaux (1978) puts it succinctly: “A fit animal is not one that fights well, but one that avoids fighting altogether.”

HOW SPECIES COOPERATE

Peaceful coexistence among organisms is only part of the story. Nature’s manner is not merely peaceful coexistence, but cooperation. Lynn Margulis (1981) writes, “Symbiotic relationships abound; many of them affect entire ecosystems.” A few examples will give some idea of the magnitude of this mutual interdependence among living things.

Many animals form close mutual relationships with plant species. The aspen sunflower of the Rocky Mountain area secretes extrafloral nectar rich in sugar and containing eighteen different amino acids needed for ant nutrition. Ants feed on the nectar and protect the flower’s seeds from devastating parasites (Inouye, 1984).

Some species provide transport for others, either of the whole organism or of its seeds. To disperse themselves, stationary creatures often take advantage of mobile ones. Barnacles attached to whales and anemones attached to crabs get free transport and an opportunity to obtain food otherwise unavailable. The anemones also provide the crabs with camouflage and probably prevent predation by octopus. Hundreds of insects and worms use other organisms for transportation and dis-

persal to more promising habitats. This practice of hitchhiking, called phoresis, has been going on for at least twenty-five million years, as is proven by amber fossils of various mites and nematodes clinging to beetles and wasps (Poinar, 1982).

Nutritious nectar rewards bees, moths, hummingbirds, and bats that cross-fertilize flowering plants. Fruits are another way plants disperse their seeds with the aid of animals. The animal eats the fruit and, sometime later and some distance away, excretes the undigested seeds, which are thus provided with their own supply of rich fertilizer. Fruits commonly have a mild laxative effect just to ensure that the job is well done. Certain seeds germinate better after being subjected to the forces of digestion. Algae form intimate symbiotic relationships with many fungi, producing what amounts to a new organism, the lichen, that can grow under conditions where neither the alga nor the fungus alone could survive. Found all over the world, lichens represent a significant part of the earth's flora, some 25,000 species!

Other fungi live in association with the roots of most forest trees such as pines, oaks, hickories, and beeches. Eugene Odum (1971) explains, "Forest trees transplanted to prairie soil, or introduced into a different region, often fail to grow unless inoculated with fungal symbionts." Other bacteria and protozoans have developed a mutualism with hundreds of ruminants, including elephants, cattle, sheep, goats, camels, giraffes, deer, and antelopes, digesting cellulose for these animals and thriving in one of their multiple stomachs.

Cleaning symbiosis benefits both the client and the cleaner: the former is rid of parasites and the latter is fed. Among land animals the tickbird cleans the rhinoceros, egrets clean various cattle, and the Egyptian plover enters the mouth of the crocodile to feed on leeches and emerges unharmed. According to marine biologist Conrad Limbaugh (1961), the cleaner-client association "represents one of the primary relationships in the community in the sea." Known cleaners include some forty-two species of fish, six shrimps, and Beebe's crab. Cleaners establish fixed stations that are visited by countless species of fish. The client fish approaches the station and poses, allowing the cleaner to forage within its gills and even to enter its mouth without danger. Limbaugh found that the cleaners could prevent the spread of bacterial infections that would normally prove fatal to the client. He concludes, "The extent of cleaning behavior in the ocean emphasizes the role of cooperation in nature as opposed to the tooth-and-claw struggle for existence."

Certain large animals support whole communities of species. For example, the elephants of Sri Lanka are sloppy eaters and make much forage available to other browsers. In a single day ten elephants can deposit on the forest floor a ton of feces. None of that dung is wasted: butterflies and beetles feed on it; birds retrieve seeds from it; mushrooms and fungi thrive on it; insects lay eggs in it; and termites convert most of its cellulose into sugars. All these uses set up further food webs, including termite eaters such as the sloth bear and the pangolin. So what is a waste product for the elephant becomes an organic treasure for scores of other creatures (Allen, 1972). "Every species . . . directly or indirectly, supplies essential materials or services to one or more of its associates," writes Lee Dice (1962).

The generic cooperation between plants and animals is also a marvel. Each needs the products of the other. Plants use the carbon dioxide in the air and water from the soil to manufacture sugars, releasing oxygen as a byproduct. Animals consume

plant sugars and oxidize them to produce energy, breathing back carbon dioxide into the air and returning water to the soil as urine. The cycle is perfect and nothing is wasted.

No single species could persist if it were alone on the planet. It would eventually exhaust all the available nutrients, and, having no way to convert its own waste products into food, it would die. Life is necessarily a cooperative venture. Biologist Lewis Thomas (1980) writes: "The urge to form partnerships, to link up in collaborative arrangements, is perhaps the oldest, strongest, and most fundamental force in nature. There are no solitary, free-living creatures, every form of life is dependent on other forms."

HOW INDIVIDUALS COOPERATE

Cooperation is also the ruling principle among members of the same species despite Darwin's (1859) assertion that "The struggle will almost invariably be most severe between the individuals of the same species, for they frequent the same districts, require the same food, and are exposed to the same dangers." How can members of the same species avoid competition if they all occupy the same niche? Nature is not at a loss for methods. One way is to have some technique to separate individuals from each other. This is accomplished in animals and plants by various dispersal techniques. Niko Tinbergen (1965) explains: "These 'dispersion mechanisms' reduce competition to a minimum. Perhaps the simplest way to disperse is just to drift aimlessly about for a while, carried and scattered by the wind or water until the time for settling has arrived. The larvae of many marine animals, such as shellfish, starfish and crabs, do this; after a few days, weeks or even months of floating life they change their behavior, sink to the bottom and settle down. Many kinds of caterpillars would lose the effectiveness of their natural camouflage and become dangerously conspicuous if they stayed together in large groups. To prevent this, the moths of some species scatter their eggs when they lay them."

The territory principle is one way nature distributes members of a species evenly across the habitat. Animals that mark off and defend definite areas divide their niche into livable plots. Territories for mating or feeding, or both, are established by hundreds of species including limpets, lobsters, crabs, spiders, crickets, grasshoppers, many other insects, bony fishes, lizards, perching birds, raptors, oceanic birds, rodents, ruminants, and most other mammals. The power of territorial borders is surprising. Zoologist Hans Kruuk (1972) reports that hyenas break off the chase of a promising prey animal when they reach the border of neighboring hyena territory, even though no other hyenas are in sight. David Kirk (1975) writes: "Territorial behavior leads to an optimum distribution of limited resources among a maximum number of individuals of a species." Territory size is regulated by innate factors. Song sparrows never establish territories greater than one acre, no matter how few are present, nor do they defend territories below about half an acre, no matter how many other sparrows are present (Kirk, 1975).

Territories are defended not by battles to the death, but by highly stereotyped threats, aggressive displays, and appeasement gestures that rarely result in injury.

Territory boundaries tend to be respected despite differences in size and strength of the antagonists. Fights to the death and cannibalism do sometimes occur in unnatural circumstances, such as with birds in a cage, or fish in an aquarium where retreat is impossible. But such is not nature's way. Animals with the most dangerous weapons also have the strongest instincts to prevent their use against their fellows. Male giraffes that can dispatch a lion with a single kick save their lethal hoofs for predators only, using their stubby, harmless horns for encounters with rival giraffes during the mating season.

Dominance hierarchies also minimize aggression among social animals. First studied with pecking orders among birds, the dominance hierarchy prevents animals of the same group from wasting time and energy by constantly fighting over food and mates. Instead of fighting, the individual animal lower in the pecking order immediately concedes to the higher one, without any struggle. Kirk (1975) writes, "In one study, the investigator deliberately kept disrupting the dominance relationships in a flock of hens. The outcome was that the hens fought more, ate less, gained less weight, and suffered more serious injuries than the control flock in which the dominance relationship was stable." Dominance hierarchies, found in many species of birds and mammals, show nature to be not only pacific but sensible. Why should a weaker individual fight a stronger one that would win anyway with probably injury to both?

Flocking together brings benefits. Many eyes are better than a simple pair in looking for predators, and a circle of musk oxen is more formidable to a wolf pack than is a single animal. Moving in schools and flocks also makes it difficult for a predator to single out one individual when dozens of others cross its field of vision, as anyone knows who has ever tried to catch a single bird among many in a cage. Many sea birds hunt in flocks because it is more efficient. All social insects live by cooperation. The individuals in a termite colony depend on each other absolutely, some being unable to feed themselves and others being unable to reproduce.

Animal care, feeding, protection, and training of young is simply too extensive to summarize. We may point out, however, that for those species that reproduce sexually, at least some kind of cooperation between the sexes is unavoidable. After years of studying group life among animals, W. C. Allee (1938) declares, "No free living animal is solitary through its life history." Nature is not a war of one organism against another, but an alliance founded on cooperation.

THE ENCULTURATION OF SCIENCE

The above account, despite its careful detail and documentation, despite the authoritative testimony of experts, and despite the obvious pattern of noncompetition and cooperation that emerges from direct observation, will, we suspect, still fail to overthrow the common conviction that nature is competitive.¹

The competition mentality did not always dominate Western thinking. There is good evidence that Darwin took the competitive scheme not from nature but from the culture at large. *Laissez-faire* economics, based on competition and unrestrained self-interest, was already firmly entrenched in England long before Darwin's birth.

But it was a product of culture, not nature, as sociologist Robert Nisbet (1953) emphasizes: "We should not suppose that the *laissez-faire* individualism of the middle nineteenth century was the simple heritage of nature, the mere untrammelled emergence of drives and motivations with which man is naturally endowed. *Laissez faire*, as the economic historian, Polanyi, among others, has emphasized, was brought into existence." At the end of the eighteenth century the poor laws, proposed to ameliorate miserable social conditions, were hotly debated. Thomas Malthus in *An Essay on the Principle of Population* (1798) argued that population growth will always exceed food sources unless it is checked by war, famine, and disease. Under the influence of Malthus, the philosopher Herbert Spencer argued, six years before Darwin published his theory, that competition for limited resources must have a beneficial effect upon the human race, stimulating human advancement and selecting the best of each generation for survival. Thus, in a very real sense social Darwinism preceded Darwin. Both Darwin and Alfred R. Wallace, codiscoverer of natural selection, acknowledge that the reading of Malthus provided them with a key insight for explaining evolution. In the Introduction to *The Origin of Species*, Darwin (1859) credits Malthus: "The Struggle for Existence . . . is the doctrine of Malthus applied to the whole animal and vegetable kingdoms." In Chapter III, Darwin acknowledges that "the expression often used by Mr. Herbert Spencer of the Survival of the Fittest is more accurate" than Darwin's own term, natural selection. (Darwin used Spencer's famous phrase for the first time in 1869 in the fifth edition of *The Origin of Species*.) Thus, Spencer had anticipated another key concept in Darwin's scheme. The other famous phrase associated with Darwinian evolution is "Nature, red in tooth and claw" and is from Tennyson's *In Memoriam*, published nine years before *The Origin of Species*. Hence, the economists, the philosophers, and the poets were imbued with the notion of competitive struggle well before Darwin published his theory of natural selection.

But again, we do not expect that these additional facts will shake the common opinion that nature is competitive, an opinion held by the average person quite independently of observation and of any authority. But what is the origin of this deep-seated conviction so impervious to the evidence? Is it perhaps impossible for the human mind to conceive of nature except in terms of struggle? No such impossibility exists. Most American Indian cultures felt a profound sense of nature's unity and harmony. Anthropologist Laura Thompson (1950) writes, "Hopi institutions express faith in an harmonious universe in which nature, the gods, plants, animals, and men are interdependent and work together for the mutual welfare of all." The same outlook is found in Japan, China, India, and in other Asian nations. In fact, most non-Western cultures regard nature as cooperative and pacific.

This means that competitive ways of thinking and living are not natural but cultural. The ultimate origin of the competition mentality is not some economic or philosophic theory. Something much simpler is at work. The common source of Malthus, Spencer, Darwin, and the conviction of the man on the street that nature is competitive is the spirit of the age: modern Western individualism. Cross-cultural comparisons indicate that the most salient feature of modern Western life is individualism, which shapes views and forms habits in every imaginable connec-

tion. In America, for example, the basic unit is the individual, whereas in China the basic unit is the family. This contrast shows itself even in names. In America a person gives his individual name first, then his family name, for example John Carpenter, as if to proclaim, "I am primarily an individual person and secondarily a member of the Carpenter family." In China it is just the reverse: In the name Wang Lin, the family name is given first and the personal name, Lin, is last, implying "I see myself primarily as part of a family and only secondarily as an individual."

The same group-individual contrast is seen in the architecture of the two cultures. The typical American house is not separated from the rest of the community by a high wall but once inside it, we find that walls separate off the private space of each individual. Chinese houses, on the other hand, are set off from the community by high walls and screened gates, though their interiors are designed for common living areas, not partitioned privacy. The wall is put around the basic unit in each culture: for Americans it is the individual, for the Chinese it is the family.

In the United States as soon as a newborn infant is brought home from the hospital, he is treated as an individual. He is put to sleep in a room by himself and is often left alone for extended periods, even while crying. In many other cultures, such as the Japanese, the Hopi Indian, and the Eskimo, the infant is seen as a part of the mother and never sleeps alone.

As anthropologist Francis Hsu (1953) points out, even the effects of alcohol differ between Orient and Occident. For example, Chinese who are drunk become even more pliant and socially docile, while Americans tend to become more daring and emotionally aggressive. The alcohol removes inhibitions in both cases but this inclines the Chinese to more group harmony and the American toward unrestrained individualistic behavior.

Individualism, then, and all of its attendant values such as independence, self-reliance, freedom, privacy, self-expression, and personal rights represent the core of modern Western culture.

In group-oriented cultures each person sees himself as a part of a larger whole so that precedence is not given to the individual but to maintaining harmony and well-being of the group. These habits of thinking and living are automatically transferred to nature as a whole. On the other hand, the fundamental axiom of individualism is that the individual person is socially, politically, and psychologically the basic unit. Thus, individualism trains each person to see himself in isolation from everyone else. But in isolation only self-interest is operative. Hence, for a person to get what he wants he must somehow force those around him to yield to his demands or he must yield to theirs. A struggle for dominance is the natural outcome.

Despite the prevailing myth, the modern Western family is not an oasis of harmonious human relations in an otherwise hostile world. Because of individualism the nuclear family is seen less as a community and more as a collection of individuals who happen to live in the same place. No common good unites the individuals; each seeks his own private interest and tends to live in a world of his own. This fosters conflict and competition. In America the generation gap, teenage rebellion, sibling rivalry, and a runaway divorce rate are considered normal. These are merely the translation of radical individualism and competition into family life.

The pattern of conflict and competition learned first in the family is repeated at school, in sports, in the business world, and throughout the culture. Psychiatrist Karen Horney (1937) describes how extensive competition is in modern Western culture: "The isolated individual has to fight with other individuals of the same group, has to surpass them and, frequently, thrust them aside. The advantage of the one is frequently the disadvantage of the other. The psychic result of this situation is a diffuse hostile tension between individuals. Everyone is the real or potential competitor of everyone else. This situation is clearly apparent among members of the same occupational group, regardless of strivings to be fair or of attempts to camouflage by polite considerateness. It must be emphasized, however, that competitiveness, and the potential hostility that accompanies it, pervades all human relationships. Competitiveness is one of the predominant factors in social relationships."

Thus, it seems natural to persons shaped by modern Western culture to project their lived experience of struggle onto nature. The imagined war of every organism against every other, then, represents a profound enculturation of science, prejudicing theories and even obscuring the facts.² The competition paradigm is so stubbornly held and immune to reasoned argument because it does not originate in a scientific understanding of nature but it arises from modern life. Thus, a challenge to the competition paradigm directly attacks the way each Westerner sees himself and how he thinks of human relationships. The evidence, however, clearly shows that nature is not competitive, but cooperative. Consequently, two choices emerge: either ignore the evidence and remain trapped within the prejudices of modern culture, or accept the facts from nature and examine the life and institutions fashioned by competition.

Notes

1. For a much fuller presentation of this evidence see *The New Biology*, Chapter 4.
2. Individualism distorts not just science but all modern intellectual life in two ways. First, the habit of thinking of the self as a primary unit that can be understood in isolation is carried over to thinking about other things; this gives rise to reductionism. Second, experience is taken to be unique to the individual; this gives rise to viewpointism, the tenet that everything is only a private viewpoint. For a fuller discussion of these themes see the authors' forthcoming book *The Impoverished Self: American Individualism in Conflict With Human Nature*, Chapter 8.

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CHAPTER 13

Natural Selection, Competition and Cooperation: Human Biology and Human Freedom

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Our species has exceeded its ecological carrying capacity for a myriad of material and spiritual resources, and short-sighted competition for what our environment can still supply is more likely than ever before to multiply into aggressive conflict on a global scale. The economic logic of the triad of population growth, competition, and cultural decline, was drawn by Thomas Malthus 200 years ago (Malthus 1798). A half century later, Charles Darwin was the first human to point out why living creatures dependent on reproduction for their continued existence had the inherent potential to grossly overpopulate their environments (Darwin, 1859).

Contemporary societies still choose to ignore the lessons proffered by historical insights. Many of today's futurists are understandably concerned by the cynical anthem that humans, like other animals, are irrevocably violent and competitive by nature, and that there is therefore nothing to be done to interrupt the course of environmental degradation and anarchy. Acknowledging our fundamental biological nature, anthropologist Ashley Montagu, and many who have followed, have sought to redefine our perspective on "nature red in tooth and claw" as a means of redefining our perspective on ourselves. While sociobiologists of the past twenty years have sought to uncover the Darwinian underpinnings of our social behavior, social scientists have argued that the selectionist view is inherently biased towards perceiving competitive interactions rather than cooperative ones. Perhaps this bias arises from the very nature of the economically competitive cultures in which Darwin and most of his followers have their own origins (Montagu 1952; Augros and Stanciu 1987, *this volume*). And if we are wrong to characterize nature as a product of ceaseless short-sighted competition, then we may be wrong to view *human nature* in this way as well.

This indirect approach suggests that we can revitalize our hopes for a better future by modelling our sense of ourselves upon a recharacterized notion of the biological world. Regardless of how we specifically define cooperation and competition, most people are directly aware that *both* are widespread in nature, and that they themselves have the capacity for both types of behavior. But how dependent are we, and other species, on our biological nature as the dictator of our behavior? In this paper, we will consider cooperation as a biological phenomenon, and by analyzing elements of its distribution within and among animal species, and employing the notion originally suggested by Montagu (1952), predict its pattern of

occurrence in humans. Such an exercise will allow the development of an empirically based model with three main attributes. First, its validity can be evaluated by tests of its predictions. Second, it will give insight into the biological significance (or basis) for variation in the expression of cooperative behavior. Third, it will provide a foundation for exploring how changes in education or socialization may counteract any biologically based selfish proclivities that once were, but are no longer, adaptive. We will explore the conditions under which cooperation occurs in several acutely social non-human vertebrate species—social ground squirrels, chimpanzees, and vampire bats—and from this empirical basis, erect a biological framework with which to evaluate the phenomenon of cooperation and project its significance to the realm of human behavior and its global impact.

The Darwinian model defined: evolution as competition, and what this means. As noted by Richard Dawkins in his controversial *The Selfish Gene* (1976), life existed and diversified on earth for three and one half billion years before it occurred to one member of one species why this was the case. Darwin's insight (1859), that inherited differences in reproductive potential among individuals would create a preponderance of the more productive types over generations (i.e., evolution) is the most provocative intellectual product of western culture to date. Does it seal our fate by proving our intransigent linkage to the biological pathways controlling all other organisms, or does it give us objective distance with which to evaluate the function and meaning of our behavior, and perhaps alter it?

Evolution by natural selection is often characterized with aggressive epithets such as that given above, and "survival of the fittest, or "the struggle for existence." Not only do such characterizations emphasize competition, they also animate the process and suggest arduous or violent combat. This is a poor characterization. While we do often seem to show a particular interest in violent elements of mammalian mating competition (e.g., the fighting of stags), the adaptive traits that we regard as most astonishing and admirable are equally the products of selection. Photosynthesis, maternal care, cooperative care of offspring by both parents, navigation in birds, echolocation in bats and dolphins, the immune system of vertebrates, the ability to thermoregulate, and to find and build shelter, language, emotion, and consciousness—all of these are abilities that originally spread in populations, were continually refined, and now characterize species, because some individuals employed them more effectively than others.

Our interest is in behavioral evolution, and it is a mistake to equate evolution by natural selection with direct behavioral competition or aggression. Animals do contest for resources, chiefly food and mates, which are the most vital links in the chain of reproduction, but they also cooperate towards the same ends.

CASE STUDIES

Here we will summarize well-studied patterns of cooperation in three disparate species of cooperate mammals to form a basis for evaluating its biology. For each case, we begin by laying a descriptive foundation with information on habitat, natural history, demography and social structure, and then consider specific acts of

cooperation. We conclude each case study with an evaluation of who benefits from such acts.

Alarm Calls in Ground Squirrels

Many birds and mammals produce stereotyped calls when a predator is detected, and other individuals quickly take notice or take cover. Alarm calls not only share important information with others, they may increase the probability that the caller becomes the predator's victim. Alarm calling is thus an excellent behavior to study from the perspective of cooperation and reciprocal altruism.

The biology of social ground squirrels in the grasslands of western North America has been closely studied by several researchers. The open habitat makes them easy to observe, and they can be captured and individually marked, so it is possible to observe interactions among subjects that vary in their degree of genetic relatedness.

Typical of many ground squirrel species, Belding's ground squirrels (*Spermophilus beldingi*) are diurnal and live in communities of closely spaced burrows, so that communication among individuals is relatively easy. They are diurnal and spend much of the day feeding near the mounded burrow entrances and scanning the landscape for predators. Upon sighting a badger or a hawk, a squirrel is likely to give a high, piercing, explosive bark. Calls are easy to localize and community members immediately turn in the direction of the caller, and then often retreat to their burrows. Yet, in spite of this group warning system, Paul Sherman (1977, 1980) found that fully 10% of predation attempts are successful. Young squirrels are especially vulnerable to predators, but individuals of all ages are taken. Moreover, *individuals that sound an alarm are probably more vulnerable to attack than are the warned individuals*. A predator may turn and pursue the animal that calls. Alarm calling is thus a striking example of a risky, giving act.

How selfless are ground squirrels that sound the warning? To answer this question, it is important to know about group composition. Like many mammals, sons disperse farther from the natal site than daughters, and so female ground squirrels find themselves in communities where matriarchal lineages accumulate within tens of meters over generations, while males are about an order of magnitude farther dispersed. Females that are close family members, such as sisters and mother-daughter pairs, even share territorial space.

Strikingly, males rarely give alarm calls after juvenile dispersal, but females, surrounded by kin, frequently call. Moreover, the females that have the most relatives nearby have the greatest propensity of all to sound alarm calls. Females are most likely to take the risk of calling when in the vicinity of daughters, granddaughters, mothers, or sisters. More distant relatives do not receive this preferential treatment. Altruism in Belding's ground squirrels is principally reserved for close relatives, and their notable ability to distinguish genetic relatedness, even at the level of full-sib versus half-sib, is well established (Holmes and Sherman 1982).

This pattern of aiding relatives is consistent with the theory of evolution by *kin*

selection (Hamilton 1964), and permits us to illustrate the thought process behind the analysis of behavioral evolution commonly employed in contemporary biology. As an extension of Darwin's theory, kin selection theory is intended to make predictions about interactions specifically among relatives. It states that selection may favor "self-sacrificing" behavior if the risk or cost is compensated, in population genetic terms, by enhancing the survival or reproduction of others in whom much of an individual's genetic information also resides (i.e., relatives). Population geneticist J. B. S. Haldane (1955) foreshadowed Hamilton's formalization of the theory by many years with the heuristic caricature: "I would give up my life for two brothers or eight cousins." Such behavior requires no self awareness in order to become established in an animal population, however, and could even occur in plants! Consider an ancestral population of Belding's ground squirrels in which alarm calling is not yet a universal trait (i.e., only some individuals possess the genetic predisposition to call in a way that alerts others). A female who calls temporarily increases the alertness of other individuals in the vicinity, and many of these will be her close relatives. Calling reduces her likelihood of survival, but if it sufficiently increases the survival probability of individuals sharing much of her genetic information, including the predisposition to alarm, the trait is numerically favored by selection and will become more common in successive generations. Notably, the rate of its increase may be decidedly reduced by the fact that the balance of the cost-benefit relation differs for adult males, for whom few relatives are typically nearby. While an alarm given by a male will benefit others, if it is not reliably *reciprocated*, there is no reason to predict that the genetic predisposition for adult males to call will spread into the population over generations. If present in adults, it should eventually disappear, as mothers among whose offspring only the daughters and juvenile males call will be the matriarches of more durable lineages than will mothers whose sons also call as adults.

A chief value of living in a group in which many eyes and ears share information about the presence of danger is that the level of wariness that each individual must maintain is probably greatly reduced (Alexander 1974). This allows time and energy to be used for other productive purposes such as feeding, hygiene and socializing. The reliable sharing of information means that each individual can live in a safer and more predictable environment. Human beings too often live among relatives. The extent to which our cooperation with them results from conscious genetic analyses such as Haldane's tongue-in-cheek remark, or is an unconscious genetic predisposition, is a matter of debate. Nonetheless, reducing the psychological, material and environmental costs attendant to disparities in the degree to which information and other resources are shared among peoples is a basic goal of global cooperation.

Reciprocal Feeding in Vampire Bats

Female vampire bats, *Desmodus rotundus*, are exceedingly social, and live for years in groups with about ten related and unrelated females. Studies by Wilkinson

(1984) in tropical American forests and with captives provide some of the best evidence of reciprocal altruism yet discovered. These bats share food in a manner which averts starvation of hungry individuals.

Vampires feed at night on the blood of large mammals—mostly livestock now—and return before dawn to roosts in hollow trees where they spend the day as a group. About one-third of the individuals less than two years old fail to feed on any given night, and 5–10% of the adults likewise fail. Because vampire bats starve to death in as little as three days, any individual that goes hungry for a night is in a dangerous state.

Reciprocal sharing of food, through the regurgitation of blood meals by sated bats to unfed bats, reduces the probability of starvation for each group member. Wilkinson experimentally removed individuals and prevented them from feeding. These starved bats were fed by roost mates upon being returned. In contrast, blood was not shared with bats that were fed while sequestered. Further, starved recipients of shared blood later reciprocate the gift more often than expected by chance alone.

Vampire bats form bonds within the groups, associating more closely with some individuals than with others. This association is an excellent predictor of who will feed whom: bats seen together in >60% of observations within the roost are those that share blood with one another. Bond-members are sometimes genetic relatives, and sometimes not: “friendship” [reciprocal altruism, Trivers (1971)] and relatedness are substantial and independent factors in these bonds of trust.

Coalitions in Chimpanzees

Cooperative behavior among related and unrelated individuals has been documented for several primate species, particularly in the contexts of defense from aggressors or combat among males for access to ovulating females. The principal attraction of examining the chimpanzee, *Pan troglodytes*, is that it is our closest living biological relative. Examining a near relative offers the possibility of gathering information from a more objective perspective than is possible in studies of our own species. In addition, chimpanzee societies may be simpler than our own, so that patterns are more readily deciphered. However, as the innovative work of Frans de Waal suggests, the politics of chimp society may itself be so familiar to us that the best interpretations are “subjective,” as if we ourselves were the subject of study, and relationships illuminated as much by intuition as by logic.

Because chimpanzees make their home in the dense forests of equatorial Africa, they are exceedingly difficult to study in nature unless they are conditioned to the presence of the observer. We do know that alliances among males in a group affect their dominance status, and also that males may work together to locate and attack outsiders (Goodall 1969). Unlike ground squirrels and vampire bats, male chimpanzees usually remain in their natal group throughout life. Male alliances in nature may thus often be among close relatives.

The most detailed studies of chimpanzee alliances are those of Frans de Waal, whose examinations of a captive group living in an extensive outdoor landscape in the Netherlands were reported in his book *Chimpanzee Politics* (1982). His studies,

conducted over several years during which two shifts of alpha-male dominance took place, showed the society of the group to be a complex, flexible, and plastic network based on cooperation, status and its energetic enforcement, and a compelling drive for daily reconciliation of differences.

Alliances formed between males in at least two contexts: coalitions to threaten the status of the dominant male, and coalitions that reinforced an intact dominance hierarchy. Males also formed alliances with females. Particular pairs formed relationships akin to friendships, but most notably, dominant male held the attention and support of most of the females in the group. Favor of the females played a major role in a male's ability to retain dominance. The dominant male also did most of the mating. In return, the dominant male defended females from attacks by the other males.

A favorite social tactic of the upwardly mobile male named Luit was to relentlessly attack any and all females that associated with the older alpha male, Yeroen. Gradually, females began to leave Yeroen's side if Luit as much as threatened approach, and Yeroen's time near the females dropped by 50%. When females were not near Yeroen, Luit's attitude toward them was completely different: he sought their company, groomed them, and played with their children.

To the extent that Yeroen was unable to defend the females with whom he associated from Luit, the female support on which he depended was undermined. How was young Luit able to indirectly dominate Yeroen in this way? De Waal believes that this unexpected state developed because of the supporting role played by the youngest mature male, Nikkie. Nikkie was just beginning to assert his dominance over the adult females, and often followed Luit's lead in beating them up. Moreover, when females intervened in support of Yeroen against Luit, Nikkie attacked them. The *combined* activities of these two subordinate males gradually eroded the female's support of Yeroen, and Luit became the alpha male after many months of effort, with full support and attention of the females.

What happened next? Nikkie turned his aggressive attentions toward *Luit*, and Yeroen supported Nikkie in these encounters! The females initially supported Luit, as they had supported Yeroen before. However, the new coalition was too strong for Luit, and Nikkie rose to alpha status within a few months.

Nikkie's apparent social sophistication is impressive. He banded in support of the alpha's greatest threat in a way that revolutionized the male hierarchy. Once his interests were no longer in parallel with Luit's, he radically altered his behavior toward his old comrade, and received support from the male he had helped to depose! His subtle responses to social context, and his manipulations other individuals in a way that determined his social fate were disarmingly familiar in their form and content to de Waal and other human observers.

A way in which chimpanzees (and some other primates) may differ from humans is in their overwhelming need for "reconciliation" after conflict (de Waal 1982, 1989). Reconciliation is a subjective term describing the apparent reaffirming of positive aspects of relationships. It begins when one of the combatants extends a hand in a gesture of entreaty toward the other, who is some distance away, and awaits eye contact. After a severe contest, the initial gesture of appeasement, and eye contact, may not occur for many minutes or hours. After eye contact is made, the

"enemies" quickly move together, hug, embrace, and chatter, and all tension seems dispelled.

Reconciliation was a daily event even between contestant males at the height of their conflict over alpha status. In fact, those in de Waal's colonies refused to retire to their indoor nighttime quarters until such emotional resolutions had been reached, sometimes forcing their keepers and observers to remain for hours past the chimps' normal bedtime.

Reconciliation may play a very important role in maintaining both group integrity and a male's social power. Not only do males in mating competition simultaneously cooperate in hunting and territorial behavior, they rapidly shift alliances as well. The importance of reconciliation may reflect the importance of alliances, because each individual in the troupe may be both friend and foe, depending on the time and context.

DISCUSSION

Cooperative behavior is observed in a diversity of animals, and its form and context are highly varied. In some cases, altruistic behavior may hinge upon genetic relatedness (e.g., Belding's ground squirrel); in other cases, aid-giving may have long term self serving benefits for the donor (e.g., chimpanzees). A beautiful and extreme development of altruism is seen in the reciprocal food sharing of vampire bats, whose lives hang in a delicate balance of generosity and trust.

Do we as humans cooperate in a fashion after any or all of the species examined? Are examples from their lives relevant to ours on a biological, mythological, or philosophical level? Which species might serve as the best role models?

It is a common practice in anthropology to examine the remnant cultures that may resemble those in which we have lived for the body of our recent evolution, namely groups of hunter-gatherers [e.g., edited volumes by Mead (1937) and Chagnon and Irons (1979)]. Such societies are often composed of a few tens of individuals with subgroups related by family to varying degrees. What forms are evident in such societies? Strong bonds of association occur among mates, parents and offspring, and siblings, as well as among unrelated individuals in groups, in reciprocal childcare, hunting, camp moving, and simple agriculture. Like ground squirrels, long term bonds involving many acts of reciprocal altruism are most common among closely related individuals, such as parents and their offspring, and siblings, but specific data on this point are scarce. Such general observations indicate that cooperation is common among but not limited to relatives, however, like the vampire bat.

To what extent is this a pattern determined by relatedness, and to what extent by simple proximity to well-known individuals who happen to be relatives? Perhaps such a question can be better answered by considering acts of altruism among "modern" humans that more commonly disperse from their natal of familial region. (However, it is notable that close settlement of kin is not restricted to hunter gathers. Very limited dispersal characterized the preindustrial western world in villages through the 19th century, still occurs in much of the world, and is still

surprisingly limited in the West (Koenig 1990). Even in modern, mobile, western society, costly acts of altruism most frequently occur among kin, often involving "favors" through new channels that involve transfer of information or resources without direct contact. Similar cooperation occurs among non-relatives, but is less common and typically involves greater formalization, as in hunter-gatherer societies (e.g., Rappaport 1967). Certainly the "modern" legal system contains numerous biases that favor and make implicit assumptions about duty and trust among close relatives, while making no such assumptions about those related distantly or who are classed as unrelated. So perhaps we have changed very little in this regard, and cooperation in our species loosely follows a "kin selection" model as occurs in the example of alarm calling in Belding's ground squirrels.

Cooperation within groups of nonrelatives often manifests in activities where a common goal is clear, as in businesses and social organizations. These contexts are similar in structure to well known settings for cooperation in other species, where cooperation in hunting, or care of the young, occurs among individuals whose benefit is likely to exceed the cost, or in which the cost is exceedingly small. In less structured settings, reciprocation is less unpredictable and individuals are strongly evaluated upon their reliability in reciprocation and upon the extent of their generosity.

If cooperation among people tends to be limited to relatives, and reciprocation is unreliable, how can we hope to extend its domain to include the great, mass acts of selflessness and sacrifice that will be required to increase the probability of long term social and ecological harmony on a global scale. Our best animal role model is not the chimpanzee, ground squirrel, or even the sometimes heroic dolphin. From what information biologist's studying animal social behavior over the past two decades have been able to gain, our best model of generosity, trust, predictability and sustained interdependence is the vampire bat.

If cooperation is truly common in nature, and, as authors such as Montagu suggest, we should admit its true frequency, deemphasize our culturally imbued focus on competition, and choose the truly gentle nature of the biosphere as our guide, it is undeniable that the vampire bat is our champion. Putting aside superstitious objections to this notion for a moment, it is clear that we can find in it both reassurance that we are not the only species that forms trusting bonds of mutual aid, and a model to emulate both in personal and political relationships. Vampire bats are mutually interdependent and rely upon one-another for survival. As humans we seek relationships that can be trusted to this depth. Vampire bats are especially generous in their interactions with friends, but aid is often given to other individuals regardless of the specifics of the relationship. By disseminating aid individual bats contribute to the stability of their local community and in doing so enhance their own standard of living and quality of life. The generosity shown by individuals that are wealthy, at least temporarily, reduces the resource disparity of the entire community and in this way allows all individuals to persist at a level that is moderate, healthy, and predictable. This last characteristic, the reduction of uncertainty, is perhaps the one gift given among vampire bats that we would most like to see in our own society.

Following the logic that we should lift our cultural blinders and embrace the

notion that nature is a cooperative venture, we have hit upon a bat as our role model. We may be touched by the depth of trust in bat society, but do they teach us anything about our problems that we do not already perceive? Like the bat, many of our problems relate to environmental uncertainty. Reliable food, clean water, health care, freedom from aggression, and the freedom to be alone, are prime elements of a standard of existence that should be possible in a cooperative world culture. The world of the bat is more simple, and cooperation on one basic problem can overcome most of its biological uncertainties. And this too was true for the small bands of humans who for millions of years peopled the earth only thinly. But like the vampire bat, for whom no amount of food sharing will spare a life if its tropical habitat is destroyed, the basic forms of cooperation that come most easily to us—the sharing of burdens with relatives and local community members—will be to little avail in the face of the complexities posed by broad scale environmental degradation, ethnocentrism and self-serving political actions unless we can enlarge this ethic to include the world's human and biotic community. Such cultural “evolution” will be largely outside the realm of natural selection, arising *de novo* from the melding of a rationally construed impetus, an emotional desire for a more equitable and predictable future, and the knowledge that social cooperation is part of our basic, biologically produced repertoire of available behavioral attributes. Our rational ability to project ourselves, our culture and our environment into the future is a basic extension of our self-awareness. Our emotional commitment to a better future is a spiritual decision to have faith in our own ability to ultimately take fair and proper action. And in this faith, we must rely upon our judgment and knowledge of our own biological nature to formulate solutions for our own biological problems of overpopulation and environmental degradation.

We have argued that it is misguided to contend, on the one hand, that our behavior is *Not in our Genes* (Lewontin et al. 1984), and on the other, that nature is cooperative, and that therefore we are cooperative rather than competitive by nature. The vampire bat could serve as a golden icon for world unification in a species less bound by superstition than our own; perhaps the bat's more important role in the present context is to disable the notion that we should look to other species to decide whether we ourselves are capable of cooperation.

The manner in which the concept of evolution by natural selection is popularly linked with competition is fallacious. When we think of competition as physical combat between individuals (“nature red in tooth and claw”), we are thinking about something other than natural selection. When we think about competition as division of resources between two species with similar niches, we are again considering something other than natural selection. If we instead interpret natural selection to mean that less able individuals in a population become relatively less common, over that, then we can appreciate its truly two-sided nature. Progress toward the more successful habitation of a particular environment is a change that most of us encourage. It is the form of such progress that is of principal concern to those who reject the natural selection as a model of human behavioral and cultural evolution, but mischaracterizing natural selection as aggressive competition forces us to deny a force responsible both for attributes that have created and exacerbate our present global problems, and attributes that offer our main hopes for overcoming these

problems. And like the motive to refocus our attention on cooperation in nature, such a position implicitly accepts the opposite of what it seeks to disprove, i.e., that our behavior is biologically constrained. Denying our fundamental biological nature in order to obliterate the notion that our behavior is selfish, *by nature*, and cannot therefore be tampered with, is philosophically undefendable and has at its root a fundamental disrespect for the laity's ability to objectively evaluate its own character. Natural selection is crucified by misconstruction, and its relevance is then denied.

Cultural revolutions have failed time after time because their "leaders" were unwilling to expose their ideology to the scrutiny of an informed constituency. Consider the problem of human reproductive behavior. If reproduction is a selfish act in a grossly overpopulated environment, then each individual must re-evaluate the gentle mythology of nurturing that child-rearing represents. Reproduction is construed as a sacred right in part because we are biological, and in part because it is assumed that most people hold it unalienable. We will not succeed in curbing such selfish elements of our behavior until we are given the opportunity to understand why we might "naturally" behave in such ways and thus tend not to perceive ready options. The group acts of selflessness we so desperately need may be impossible to foster *except in a society in which we are educated to know what our animal functions are, where they came from, and why they are no longer adaptive, thus posing a keen threat to civilized existence*. The decision to forgo the experience of nurturing multiple children can only be made by individuals given the information to distinguish their biological nature from their role as adults in society. If we deny our biological nature, this goal is unattainable.

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CHAPTER 14

The Successful Father's Argument for Sex: A Model for the Evolution of Sexual Reproduction

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I. INTRODUCTION

Sexual reproduction is one of the most spectacular and widespread instances of cooperation in nature. In vast numbers of species, male and female physiology has become so complementary and interdependent that reproduction cannot occur without sexual union by two very different kinds of gametes (eggs and sperm) produced by two very different kinds of organisms or tissues (females and males). The physiological coordination and cooperation which takes place each generation is exquisitely and awesomely complex. The behavioral coordination and cooperation involved in courtship, copulation and rearing of offspring is, in many species, no less striking.

It is often assumed that cooperation occurs when, and because, it is in the interests of the cooperating parties. With regard to cooperative sexual reproduction, it is also assumed that the most striking consequence of sex—the mixing of genetic material—is its *raison d'être*. This paper will attempt to challenge both of these assumptions, and show that cooperation in general, and cooperative sexual reproduction in particular, can become established even when it is not to the overall benefit of the cooperating parties.

For all its glory, the existence of cooperative sexual reproduction is perhaps the greatest unsolved puzzle in evolutionary biology. The adaptive significance of males, and of sex as we know it, is quite unclear. Although males and females contribute the same amount of genetic material to the next generation (and so receive the same evolutionary payoff) males in most species contribute far less than females to the production and care of the next generation. Why do females cooperate in what seems to be an extremely unequal exchange? It is recognized that sex increases genetic variability, and that this may increase the rate at which species can adapt to their environments. However natural selection generally does not promote characteristics which benefit species or groups *unless* those characteristics also benefit individuals. And yet, certain generally accepted facts of life suggest that the fitness of sexually reproducing individuals should be only half that of asexually reproducing individuals.

Sex is costly. Females in species which reproduce sexually throw away half of their genes in meiosis, break up adaptive combinations of genes which have served them

well, and accept the major burden of producing and/or caring for eggs and offspring which are only 50% related to themselves. Sexually reproducing females also bear the burden of producing sons who take advantage of the reproductive resources of females, yet produce no eggs or offspring themselves.

Because these costs of sex are borne primarily by females, and because asexual reproduction should be an easily achievable physiological alternative, evolutionary theorists have searched for two decades for long or short term benefits of sexual reproduction which might outweigh the costs of sex to females. Many hypotheses have been advanced. It has been supposed that sex enhances adaptation to changing or spatially diverse environments, or minimizes competition in limited environment, or eliminates deleterious mutations, or that it is a mechanism for the repair of damaged DNA, or for reducing the effectiveness of parasites (Bell 1982; Maynard Smith 1978; Williams 1975; Michod and Levin 1988). All of these hypotheses try to explain how recombinatorial consequences of sex benefit females. None of the hypotheses has proven adequate. The general consensus is that a clear solution to the problem of sex is still wanting.

The present paper shifts attention from recombination, and the mothers who seemingly suffer reproductive losses through sex, to differential reproduction by successful fathers—the party which gains the most from sexual reproduction. Recent discussion of the evolution of sex neglects the fact that in polygamous species (which are in the majority) sex creates the opportunity for some males to achieve great reproductive success (Bateman 1948). In this paper we will suggest that sexual reproduction may have evolved because it benefits a relatively small but evolutionarily influential contingent of male parents, so much as to override the disadvantages of sex to the typical male of female.

The reader may note that our proposed account of the evolution of sex does not take the form of the typical adaptive explanation—rather than explain why sex is adaptive, we will try to show how sex could be naturally selected even though it is *not* generally adaptive. However, our argument is a straightforward extension of modern game theoretic and sociobiological theory, and we will try to make this clear. The reader may also note that our account is “unsavory” in that it is based upon the notion that sexual reproduction is imposed upon females by males. However the present theory is not concerned with conflict between male and female individuals so much as it is concerned with an evolutionary “arms-race” between male and female life-history strategies. And besides, while there may be some ethically relevant lessons to be learned from evolutionary and game theoretical models of the present sort (and we will try to point out a few in the general discussion) they provide no ethical mandates. Indeed, our model shows how the evolutionary working-out of an intrinsic conflict of interest between male and female strategies can give rise to an evolutionary stable condition characterized by cooperation and coordination. Further, it demonstrates that such a “peaceful kingdom” does not, and need not, maximize the goals of the majority. The normative ambiguities captured by the model are themselves potentially illuminating, especially since the model may be applicable to other bio-cultural situations quite unrelated to the evolution of sexual reproduction.

Thus this paper offers a new hypothesis about the evolution of sexual reproduc-

tion, with some possible implications about cooperation in general. In Section 2, we present the relevant biological facts which form the basis for our account of sex, examine its most controversial assumptions, and introduce a game theory model which instantiates these ideas. Section 3 presents the model, the results of our computer simulations, and provides an analysis of those results. Finally, Section 4 argues that even if our model does not offer a correct account of the evolution of sexual reproduction, it may well be applicable to other biological, social and political situations in which the potential for conflict provides a context for cooperation. We will also point out that while game theory and evolutionary theory are necessarily silent about how things ethically ought to be, they can provide analytical tools and pragmatic principals for exploring how ethically desirable conditions (identified through moral rather than scientific considerations) can be effected, for better or worse, by social and evolutionary dynamics.

II. BACKGROUND TO THE MODEL

In species with a 50:50 sex ratio, on the average males have the same number of offspring as females, but the reproductive success of the average *father* is often much greater than that of the average *mother*. Most females do become mothers, and the number of eggs and offspring which can be produced is usually limited by the availability of environmental resources. In females, therefore, the number of offspring produced varies only as much as environmental resources vary. In males, on the other hand, gametes are so "cheap" that a small minority of males can father a disproportionate number of offspring by mating with a large number of females, while the remaining males get to father disproportionately few offspring. Male reproductive success is thus limited by the availability of mates, and it therefore varies tremendously within populations (Bateman 1948). In the extreme case, few males get all the matings and father the majority of the next generation while most males have no offspring at all. Thus the reproductive success of fathers can be huge, and is often much greater than that of mothers, typical males, or typical females. Therefore, while sex may well be somewhat costly to many mothers and disastrous to many males, it is greatly to the reproductive advantage of just those individuals who make the greatest genetic contribution to the next generation (i.e., fathers).

The foregoing is not controversial in biology. Less conventional, however, is the hypothesis that sex is the result of an evolutionary conflict in which one party—reproducing males—had a fundamental and overwhelming advantage over all other parties. The selection pressures favoring the resistance to sexual reproduction in females should be minor compared to the pressures favoring adaptations which maximize fatherhood, including adaptations which breach the defenses of would-be asexual females. Even if sexual reproduction were to reduce a female's reproductive potential by one half, as is thought to be the case, copies of a dominant gene which enabled a male to inseminate females would still spread through the gene pool so long as they more than doubled the productivity of males bearing the gene; in general such a gene would be selected provided that the factor by which it

increased a male's reproductive success exceeded the proportion $1/(1-\text{Cost})$, where Cost is the proportion of reproductive success the female loses by virtue of the mating (Parker 1979). Furthermore, genes-for-resistance-to-sex would have a hard time establishing themselves even though they enabled their female bearers to reap the twofold benefits of parthenogenesis, because they would prepare the ground for their own defeat. If a group of parthenogenetic females were to establish themselves, they would provide an extremely fertile "niche" for a gene-for-sex, which might provide the physiological, pheromonal, or behavioral means to breach the female's resistance. Such a gene would be copied into half of the progeny of each successful mating, a number which could be as large as the entire group of females.

Ironically, then, it is not impossible that sexual reproduction and cooperation are the product of competition and manipulation. However, it should not be concluded that the conflict being portrayed here is a "war of the sexes." First, the present account suggests that sex actually benefits the most prolific mothers as well as fathers. Those males who manage to father a disproportionate number of offspring are also propagating their mothers' genes; mothers of the most successful males will have more grandchildren than would have been possible through asexual reproduction. Indeed, in the situation in which a group of would-be parthenogenetic females is being invaded by a male with a gene for breaching their defenses, the first females to abandon the parthenogenetic strategy may in fact benefit greatly if they thereby enable their sons to share their father's success at exploiting other would-be parthenogens. The genes of the least resistant (or most discriminating) females would thus be selected along with those of the male "invaders." Even taking into account the fact that sexually reproducing organisms are only 25% related to their grandchildren, a minority of female (as well as male) grandparents may thus benefit greatly from sex.

Second, as mentioned earlier, the present theory is not concerned with conflict between male and female individuals so much as it is concerned with an evolutionary contest between male and female life history strategies.

However, there is a kind of contest between male and female individuals which does play an important role in our model. We assume that the "option" of reproducing sexually or asexually is not one that females can exercise unilaterally. Rather we assume that they can unilaterally invest more or less of their resources in an attempt to reproduce asexually, but succeed only if they are not outmatched by males who have invested in adaptations designed to promote sexual reproduction. Male "armaments for sex" might be pheromones, social behaviors ("persuasion"), muscles, or any other traits which could be used to increase the tendency of females to mate with them. Female "armaments for parthenogenesis" might include sensory mechanisms, "male repellents" and defenses, anatomical or physiological impediments to sperm, and/or any other traits which could reduce the probability of manipulation and insemination by males.

The idea that female mode of reproduction might be, or might at one time have been, subject to male manipulation is a strong and unconventional assumption, but we believe it warrants further consideration given the notable failure of conventional hypotheses to account unambiguously for the maintenance of sex. Furthermore, in recent years it is increasingly common to suppose that evolved traits may be

mechanisms or consequences of manipulation by other organisms (Dawkins 1982; Dawkins and Krebs 1979; Krebs and Dawkins 1984).

As Dawkins (1982) has argued most forcefully, there are conditions in which manipulation is in the best interests of certain "actors," and in which the recipient is at a disadvantage in attempting to avoid manipulation. The very existence of viral, bacterial, and parasites is living proof that the costliness of a parasite-induced trait is no guarantee of the trait's or the host's extinction. Many of these parasites achieve their ends by manipulating the physiology and behavior of their hosts, in a manner which is directly analogous to role we suggest for males in the evolution of sex. Furthermore, parasites can "out-adapt" hosts because they are under more intense selection pressures than their hosts, and because they evolve faster (see Hamilton 1982); we will argue below that the evolutionary advantage of parasites in their contest with hosts is similar to that of males in their contest with females. Finally, just as hosts can fail to evolve resistance to parasites because the requisite defenses can "engender a cost that may . . . preclude a net selective advantage for the resistance phenotype (Levin et al. 1982, p. 217) we suggest that the cost of resistance in females can exceed the potential benefits, as substantial as those are.

Thus, our only innovation (if that it be) is in considering the possibility that sexual physiology is subject to manipulation by males. While females may well have an "inside advantage" enabling them to purchase armaments-for-asexual reproduction at reduced cost, males can afford to outspend them because of the potentially massive payoff for sexual reproduction. The model presented in the next section pits these two advantages against one another, and thus makes it possible to explore the conditions under which one mode of reproduction or the other would prevail.

It should also be noted that there are three reasons why the intrinsic disadvantage of individual males *versus* individual females in the contest over female reproductive strategy may not be as severe as one might think. First, almost all species of organisms reproduce sexually at least some of the time, and for reasons which are easy to understand. Under extreme conditions such as starvation, or antibiotic attack, even usually asexual microorganisms exchange genetic material. This is presumably adaptive because new genes offer the only chance for survival. However, if females are going to be selected for retaining the option of sexual reproduction to deal with extreme conditions, they will need to be able to identify such conditions from other conditions, presumably by sensing aspects of the environment. And this might make them vulnerable to males whose "armaments" had evolved to "jam" or deceive females' sensors. It is not clear that females have an intrinsic advantage in a contest of this sort.

Second, the evolution of adaptations-for-sex in males should proceed much faster than evolution of adaptations-against-sex in females because genetic variability and competition among sperm dwarfs that among eggs (Parker, Baker, and Smith 1972). This asymmetry (similar to that between conventional parasites and their hosts) is distinct from, but supportive of, the asymmetry in selection pressures modelled here. Both are examples of what Dawkins and Krebs (1979) call the "life/dinner principle," after a fable of Aesop's: "The rabbit runs faster than the fox, because the rabbit is running for his life while the fox is only running for his dinner"

(Dawkins 1982, p. 65). In this case, the argument is that sex exists because would-be asexual females could only "run" to avoid the costs of sex while would-be fathers could "sprint" to reap the overwhelming reproductive benefits of fatherhood.

Third, Maynard Smith (1980) shows that when parental investment increases their offspring's fitness, parents should invest more in the sex with the greater variance in reproductive success. Our model does not stipulate that male variance remains high when a stable equilibrium has been reached.

The present model shows that the reproductive benefits of successful fatherhood may often be great enough to select males who invest so heavily in "armaments" for sex that females cannot afford the defenses which would be necessary to achieve asexual reproduction. The results are pleasingly like what is in fact observed in nature: natural selection favors females who invest nothing in the contest, which in turn requires little investment on the part of males. This result obtains even if it is assumed that females have a substantial advantage in the purchase of armaments for resisting males.

III. THE MODEL

The model treats a haploid population of unicellular organisms consisting of males and facultatively parthenogenetic females. (See Figure 1.) (Multicellular organisms are considered below.) In asexual reproduction, a female undergoes a brief homozygous diploid phase when she has grown to double her original size. The diploid organism then divides to produce two haploid daughters. Sexual reproduction occurs when a male is able to mate with a haploid female and produce heterozygous diploids whose genetic material is subsequently divided up into two haploid offspring. We assume that both sex and investment in "power" (persuasiveness or resistance) are determined at a single locus (each type of male and female is an independent strategy). Thus, asexual females produce two exact replicas of themselves. Sexual unions produce one daughter and one son, each of whom invest as much in power as their same-sexed parent. This scheme has a number of consequences worth noting briefly. It means that there can never be more males than females in the population. It implies that, since a parthenogenetic population would consist entirely of females producing two daughters apiece, such a population would therefore double each generation relative to a sexual population. And it incidentally implies that the production of haploid "gametes" is the primordial condition; "meiosis" emerges as an evolutionary *consequence* of sex.

Assuming that males contribute nothing to support the female or her offspring, parthenogenesis is clearly preferable for the female since it doubles her genetic contribution. For the male, sexual reproduction is preferable, since without mating his success is zero while with mating his success can be very great. The model thus captures the conflict between the sexes.

We posit that under ideal conditions a normal male, without competition from other males and in an environment of totally non-resistant females, can produce sufficient sperm and encounter sufficient eggs to produce B offspring. This "maximal reproductive potential" B is of course rarely realized in nature or in our

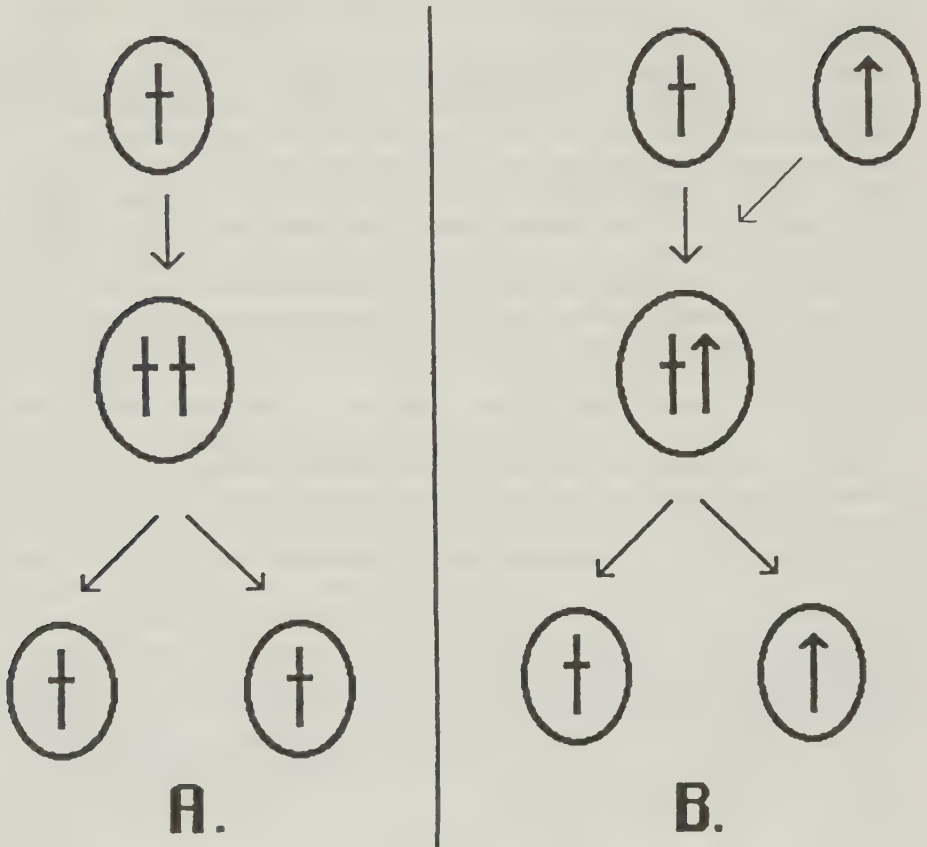


Figure 1.

simulations. But it is worth remembering that in many species B is a very large number (cf., Dewsbury 1982).

Some females can repel the mating efforts of some males. We assume that males are ranked according to "persuasiveness" and females are ranked according to "resistance" in a single encounter. Mating occurs only if a male's persuasiveness is greater than or equal to a female's resistance.

However, investment in persuasiveness and resistance comes at a price to the individual which can be conceptualized as a decrease in general viability or life span L below its maximal value of 1 ($0 < L < 1$). The relevant effect of the decrease is a reduction in the maximal number of offspring an individual can produce. Thus, males who have made some investment in persuasiveness ($L_m < 1$) can father at most ($B L_m$) offspring; similarly females who have invested in resistance can produce at most ($2 L_f$) eggs. (In fact, as explained below, male success is further

reduced by competition with other males and by the unavailability of matable females.)

These constraints restrict the range of potentially viable male and female strategies (see Figure 2a). Females who invest more than .5 of their resources in resistance will not be selected, because even if they were to thereby achieve asexual reproduction, their success would be less than that of females who invest nothing in resistance. Thus, the horizontal line at $L_f = .5$ represents the greatest expenditure that can possibly be adaptive in females. The analogous lower limit for male life is the vertical line at $L_m = 1/B$; in Figure 2a we have assumed that $B = 10$. Finally, males operate within another constraint which stems from their inability to reproduce in the absence of matable females. Long-lived but nonpersuasive males who are not eligible to mate with any females will necessarily die off. Thus, the population exists within the domain of the borders in the box.

The ability of an individual to mate or resist mating is a function of his or her investments in "power"—resistance or persuasiveness respectively. In our implementations, E_{ij} , the eligibility of a male of type i with a female of type j , is a function of the difference between L_f and L_m , as illustrated in Figure 2. In Figure 2a, no intrinsic advantage is granted to females in the purchase of power: males are never able to mate with females who have invested more than they ($E_{ij} = 0$); they are always able to mate with unfertilized females who have invested less than they; and mating occurs on .5 of the encounters between males and unfertilized females who have made equal investments in "power." In Figure 2b, a female advantage $A > 1$ is introduced, where it corresponds to the slope of the "line of equal power." In the example, a slope of 2 indicates that males must "pay" twice as much as females in order to achieve a given level of power. As A increases, the area in which eligibility = 1 contracts, and males gain relatively little access to matable females per unit investment of life.

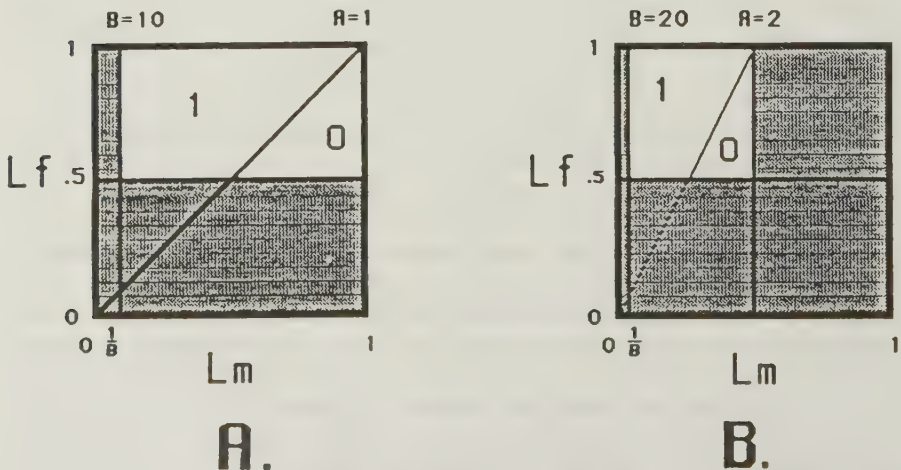


Figure 2.

Before presenting the equations on which our simulations were based, it will be useful to show that female A (advantage) and male B (maximal reproductive potential) compensate for each other exactly. Compare Figures 2a and 2b. The crucial point is that the bordered region is merely compressed horizontally when $A = 2$. In fact, the two figures depict exactly the same contest because, as mentioned earlier, the success of males of each type, and their impact upon females, is always proportional to the quantity $(B L_m)$ (see equations (2), (5) and (7)). Thus doubling A reduces L_m by half, but doubling B compensates for this exactly. Thus, simulations in which $A = 1$ and $B = 10$ are exactly equivalent to those in which $A = 2$ and $B = 20$. It is the ratio of B to A that matters, and so our first set of simulations is based on the eligibility functions of Figure 2, while we vary B.

Computational Formulae

In computing the composition of each generation we assume that all males able to mate with females of a given type are in competition with each other for those females. M_i' , the number of males of type i in the next generation, is equal to the total number of offspring achieved by males of type i with females of each type:

$$M_i' = \sum_j S_{ij}. \tag{1}$$

S_{ij} , the success of males of type i with females of type j , is computed differently depending on whether or not some females of type j are achieving asexual reproduction.

In presenting the computation formulae it is convenient to define a quantity Y_{ij} , the number of "eligible encounters" of males of type i with females of type j , corrected for the eligibility of those males with those females:

$$Y_{ij} = E_{ij} M_i L_i B \frac{L_j F_j}{\sum L_j F_j} \tag{2}$$

where E_{ij} is the eligibility of males of type i with females of type j , M_i and F_j are the number of males and females of type i and j , respectively, and L_i and L_j are the life spans achieved by males and females of each type. Thus, $(L_i B)$ is the total number of encounters effected by males of type i , and $L_j F_j / \sum L_j F_j$ is the proportion of those encounters which involves females of type j . Note that females of each type (or their eggs) are encountered in proportion to their numbers; males cannot "seek out" only those females with whom they can mate.

When there are sufficient males to mate with all females of a given type, that is when

$$F_j < \sum_i Y_{ij}, \tag{3}$$

then the frequency of females of type j in the next generation is

$$F_j' = L_j F_j. \tag{4}$$

In this case, males of each type achieve success with those females in proportion to their eligible encounters with those females:

$$S_{ij} = \frac{Y_{ij}}{\sum Y_{ij}} L_j F_j = \frac{E_{ij} M_i L_i}{\sum E_{ij} M_i L_i} \quad (5)$$

where S_{ij} denotes the success of males of type i with females of type j .

In contrast, when some females are *not* mated, i.e., when

$$\sum L_j F_j > \sum_i E_{ij} M_i L_i B, \quad (6)$$

then

$$S_{ij} = Y_{ij} = \frac{L_j F_j}{\sum L_j F_j} E_{ij} M_i L_i B. \quad (7)$$

In this case, female success is doubled for those females who reproduce parthenogenetically:

$$F_j' = 2L_j F_j - \sum_i S_{ij} = 2L_j F_j - \sum_i \frac{L_j F_j}{\sum L_j F_j}. \quad (8)$$

Simulations

Based on these equations, simulations were run in which 10 male strategies were pitted against 10 female strategies, each arrayed evenly over the full range of the life continuum from $L = 0$ to $L = 1.0$. Our simulations begin with a population of 1,000,000 composed initially of 10,000 males of each type and 990,000 females of each type (starting conditions are usually not important determinants of the behavior of the model because, as will be seen, it periodically returns to a characteristic "quasi-stable" state). Population size is renormalized to 1,000,000 each generation to account for external limitations. We also assume that no allele ever dies out completely, setting the minimum frequency of each type at 10 out of 1,000,000 (this is equivalent to assuming the existence of adequate genetic variation, as in our scenario of "extreme conditions" selecting for maintenance of the option of sexual reproduction). The ratio of B/A was varied from 2 to 1000.

A Typical Run

Simulations based on eligibility functions such as those of Figure 2 exhibit a characteristic cycle like that observed in Parker's (1979) similar model of male/female conflict. The following description applies to a run in which the ratio of B to A is equal to 10 (e.g., the maximal male mating potential B equals 50, and females can purchase power 5 times more cheaply than males).

Initially females investing more than $L_f = .5$ die out because, as noted previously, their success is necessarily less than that of females who invest nothing in resistance. This leads to the demise of the strongest males who are now investing more than is necessary to mate with the toughest extant females. Then, the "weakest" males die out because they can mate with only a small proportion of females and because they are in competition with all other males. Under the parameters of this run, most

females are mated regardless of their investment in resistance, and so those females do best who invest least in resistance. But as non-resistant females increase in frequency, males need invest less in persuasiveness. And so, the population moves to a quasi-stable configuration in which most females invest nothing in power and most males invest next-to-nothing (i.e., just enough to mate most females). The configuration is only quasi-stable, however, because when there are virtually no powerful males extant, it becomes possible for females who invest in resistance to achieve asexual reproduction. However, as their numbers increase, they create a fertile niche for males who invest in sufficient persuasiveness to mate with them. So those males rebound, and so on. The effect of varying the magnitude of B/A on these cycles (loss of vigilance, upsurge of powerful individuals, quelling of the upsurge) is primarily to increase or decrease the size and duration of the upsurges of resistant females and highly persuasive males.

In order to summarize the results for various ratios of B/A , simulations were run for 1000 generations duration. Figure 3 presents the sex ratios obtained over the last 500 generations and the highest and lowest sex ratios obtained in the same period. (The first 500 generations were intended to allow the simulation to stabilize; in fact, runs appear to settle down to repetitive oscillations after approximately 100 generations. No progressive trends are discernible thereafter.)

The results show that plausible values of B result in sexual reproduction even if

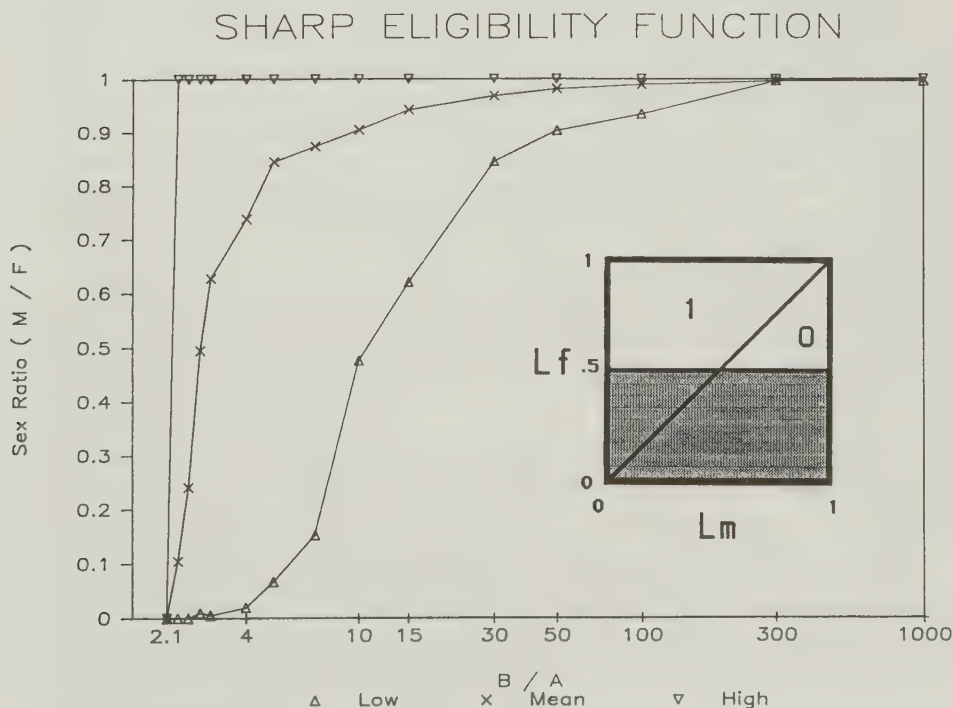


Figure 3.

females have a substantial advantage in the purchase of power. In general, the long-term average sex ratio is approximately $1 - (1/B)$. For example, we obtain a long-term average sex ratio of .99 when $B/A = 100$. This indicates that even if it is supposed that females can acquire 20 times as much power as males, for a given expenditure of life, they will still fail to achieve asexual reproduction in species in which a single male inhabiting a world of non-resistant females and without competition from other males would successfully produce 2000 offspring. This is a large number, but it is probably smaller than the actual reproductive potential of males in many species.

However, even when the sex ratio is near parity, the model does exhibit small but ongoing oscillations, the likes of which are not common in nature (but see below). We now show that oscillations are in large part eliminated when the eligibility function is made more gradual (cf., Parker 1983).

Smooth Eligibility Functions

Two smooth functions were investigated. In the first, the eligibility of males with females of equal power remains equal to .5, but relatively small increases or decreases in power result in proportionately small changes in eligibility. Thus in place of the old eligibility function which gave values of . . . 0, .5, 1, 1 . . . , we have a new one which gives values of 0, .1, .3, .5, .7, .9, 1.

The results are presented on the right side of Figure 4. The "Smooth" eligibility function greatly prolongs the period of the cycles in some simulation. These simulations were continued until recurrent oscillations were observed, and Maxima, Minima, and Means were based on those recurrent cycles. The most notable effect of the Smooth function is that it markedly reduces the region of cycling. Sexual reproduction fails completely unless the ratio of B/A is approximately 2 or more and succeeds totally when that ratio is 4 or greater. The evolutionarily stable configuration in such cases consists of all females investing nothing in power ($L_f = 1$) and all males playing the strategy in which $L_m = .8$. So while the Smooth function favors females in the low ratios of B/A , it vastly favors males over the greater range of biologically plausible ratios. To take the metric used earlier, the maximal male reproductive potential would need to be only 80 in order to impose sexual reproduction on a population of females with a 20 fold advantage in the purchase of armaments.

Perhaps this is "unfair" to asexual females. Compared to the original eligibility function, the smooth eligibility function does reduce the ability of would-be cloners to resist males of substantially less power. However, similar results are obtained under the second smooth function, as well, which increases the ability of females to resist males. That function, presented on the left side of Figure 5 (inset) is simply shifted to the left, such that males are completely ineligible with females of greater power, and achieve an eligibility of only .1 with females of equal power. Nonetheless, under the "Smooth-shifted" function, an only slightly higher ratio of B/A is required for sexual reproduction to flourish as illustrated in Figure 4. The evolutionarily stable configuration in this case is $L_f = 1$, $L_m = .6$.

SMOOTH ELIGIBILITY FUNCTION

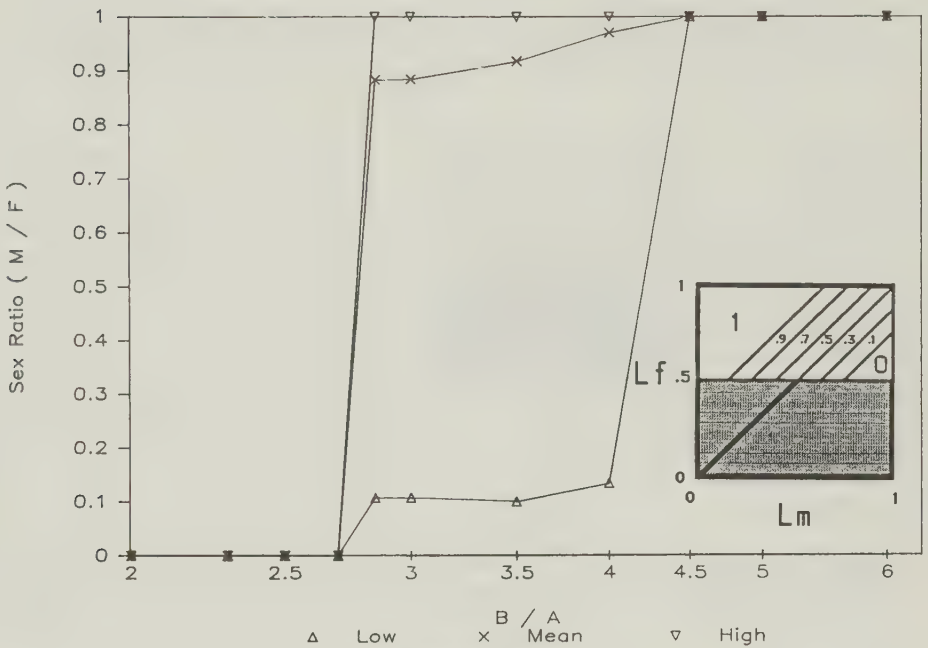


Figure 4.

Analysis: Why These Configurations are Evolutionarily Stable

Suppose all females are playing a single strategy, $L_f = 1$. Then there is necessarily a single optimal male strategy: the one which optimizes the tradeoff of increased eligibility and decreased life. But will all females continue to play $L_f = 1$ when all males play that optimum? If so, then the configuration is evolutionarily stable, provided also that males playing that optimum can in fact afford their strategy sufficiently to mate all females.

Thus, if we assume that all females are playing the strategy $L_f = 1$, we can easily determine the optimal male strategy, because male success is always proportional to $E_{ij} L_i$ (see Table 1, which is based on equations (2), (5), and (7)).

So, when all females are playing $L_f = 1$ the optimal male strategy under the Smooth function is $L_m = .8$ and under the Smooth-shifted is $L_m = .6$. Can males who play this strategy reproduce themselves by mating with all females who play $L_f = 1$? Equation (3) specifies the condition under which all females are mated. When all females are playing $L_f = 1$ and all males are playing a single strategy, this simplifies to

SMOOTH-SHIFTED ELIGIBILITY FUNCTION

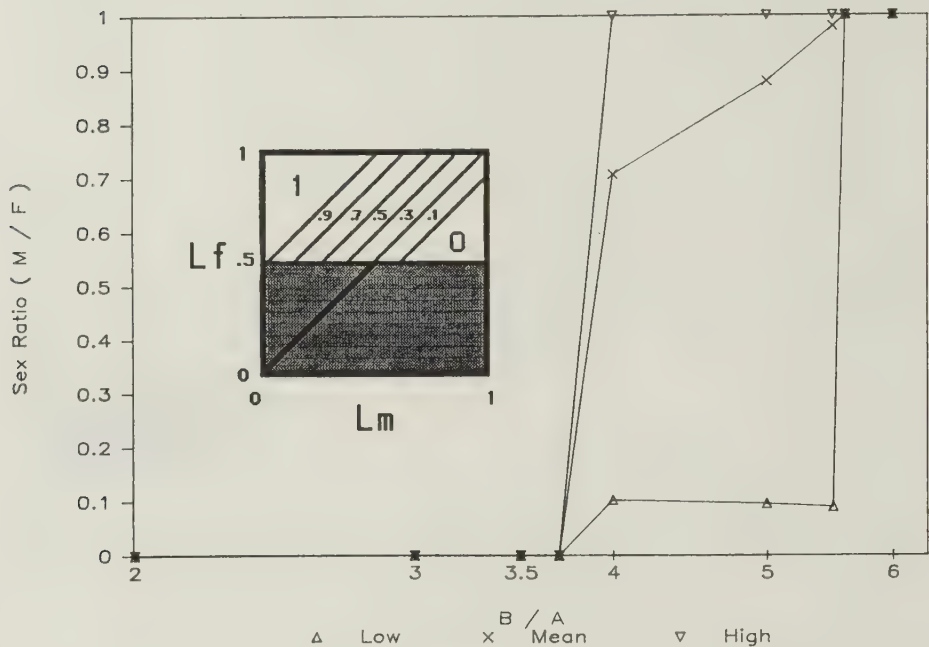


Figure 5.

Table 1
Eij Li when all Lf = 1

Smooth Eligibility Function $L_m * E_{ij} = E_{ij} L_i$			Smooth-Shifted Eligibility $L_m * E_{ij} = E_{ij} L_i$		
1	.5	.5	1	.1	.1
.9	.7	.63	.9	.3	.27
.8	.9	.72	.8	.5	.4
.7	1.0	.7	.7	.7	.49
.6	1.0	.6	.6	.9	.54
.5	1.0	.5	.5	1.0	.5
.4	1.0	.4	.4	1.0	.4
.3	1.0	.3	.3	1.0	.3
.2	1.0	.2	.2	1.0	.2
.1	1.0	.1	.1	1.0	.1
0	1.0	0	0	1.0	0

$$F_j < E_{ij} L_i M_i B. \tag{9}$$

That is, the number of females must be less than the number of matings males can achieve. In the situation we are examining, this simplifies further because $F_j = M_i$. The condition for males to be able to maintain their numbers is thus

$$E_{ij} L_i B > 1. \tag{10}$$

We have already seen that in the smooth eligibility function, males will play the strategy in which $E_{ij} L_i = .72$. Equation (10) therefore indicates that males will be able to maintain their numbers if $B > 1.4$; the corresponding threshold for the Smooth-shifted function is 1.85. Below these thresholds, males simply die out.

Above these thresholds, stability still depends on whether other female strategies can be more successful than that in which $L_f = 1$. The question is, with all females playing $L_f = 1$. The question is, with all females playing $L_f = 1$ and all males playing the appropriate optimum, could an alternative mutant female strategy invade? If not, the configuration is evolutionarily stable. The success of a female strategy is given by equation (8). In the situation we are examining, $\sum E_i M_i L_i = E_i M_i L_i$, where i refers to the optimal strategy, and $\sum L_j F_j = M_i$. So equation (8) simplifies to

$$F_j' = 2 L_j F_j - (L_f F_j E_{ij} \bar{L}_i B) \tag{11}$$

(or $F_j' = L_j F_j$ from equation (4) if all mutants are in fact being mated, in which case the strategy cannot possibly invade). A mutant strategy will spread when $F_j' > F_j$. Setting $F_j = 1$, this requires that

$$L_j (2 - E_{ij} L_i B) > 1. \tag{12}$$

Note that L_i is the life of males playing the optimal male strategy and that E_{ij} is the eligibility of encounters between those males and females of the alternate strategy j (not the predominating female strategy $L_f = 1$).

Table 2 shows how well such alternate strategies in fact fare against the optimal male strategies for the two smooth eligibility functions.

Under the Smooth eligibility function, alternate strategies cannot arise if B is greater than 4.17; under the Smooth-shifted function, B must be less than 5.57. The conclusion is that if B/A exceeds these limits then the configuration ($L_f = 1$, $L_m = \text{optimum}$) will be stable. There are certainly more elegant ways to find these limits, but the present method does permit one to explore alternative eligibility functions simply.

Discussion

The upshot of the analysis would seem to be that when B/A is assumed to be no larger than the facts of life allow, and even if females are assumed to have substantial advantages in the ability to invest efficiently in resistance, males can afford sufficient persuasiveness to "impose" sexual reproduction on a population of females for whom asexual reproduction would be preferable (if males had not made the cost of resistance prohibitive). Under such conditions, simulations and analysis suggest that the contest is a "walkover" in which females in fact invest nothing in

Table 2
Success of other females strategies when all females but one play $L_f = 1$ and all males play the appropriate optimum (L_i).

Lj or Lj (2 - Eij Li B) = Fj'	Smooth Eligibility Function			
	B = 2	3	4	5
1.0 (2 - .9 .8 B)	1.0	1.0	1.0	1.0
.9 (2 - .7 .8 B)	.96	.9	.9	.9
.8 (2 - .5 .8 B)	.96	.8	.8	.8
.7 (2 - .3 .8 B)	1.064	.896	.728	.7
.6 (2 - .1 .8 B)	1.104	1.056	1.008	.96
.5 (2 - .0 .8 B)	1.0	1.0	1.0	1.0

Lj or Lj (2 - Eij Li B) = Fj'	Smooth-Shifted Eligibility Function				
	B = 2	3	4	5	6
1.0 (2 - .9 .8 B)	1.0	1.0	1.0	1.0	1.0
.9 (2 - .7 .6 B)	1.044	.9	.9	.9	.9
.8 (2 - .5 .6 B)	1.12	.88	.8	.8	.8
.7 (2 - .3 .6 B)	1.148	1.022	.896	.77	.7
.6 (2 - .1 .6 B)	1.128	1.092	1.056	1.02	.984
.5 (2 - .0 .6 B)	1.0	1.0	1.0	1.0	1.0

resistance and rarely attempt to reproduce asexually. Selection pressures favoring successful fatherhood can outweigh a two-fold pressure favoring successful asexual motherhood, even if sexual reproduction has no other benefits.

Extension of the Model

As presented, the model applies most straightforwardly to the haploid unicellular organisms described in the introduction, but the present analysis can be modified slightly to deal with multicellular and/or diploid organisms. In fact, the advent of sex in a haploid species of the sort described would essentially transform it into a diploid species. While one can envision an evolutionary progression from the scenario depicted in Figure 1b to the familiar XX, XY system, we will only note here that the model we have presented does apply to the XX/XY system if it is assumed that genes for male strategies reside on the Y chromosome and are dominant over genes for female strategies (recall that a single locus specifies both sex and investment in power).

In the control of diploid adults one might suppose that some females would attempt to regain the benefits of asexuality by producing unreduced, diploid eggs (clones). However, there is no reason to suppose that these would-be cloners would fare better than their haploid predecessors. Resistance would probably be no easier in this case, and if males succeeded in fertilizing some of the cloned eggs (thus rendering them triploid) their viability would presumably be reduced substantially. This reduction in reproductive success of clones would be an additional impediment to asexual strategies beyond the Life-cost considered earlier, further reducing the reproductive success of diploid females attempting to clone. Therefore, com-

pared to the haploid would-be-cloners of the scenario modelled above, this strategy would be less, rather than more, able to invade. In contrast, the success of the male strategy is unaffected by the existence of a few diploid females attempting to clone, if the latter fail to increase in number.

Finally, the last analysis can also be applied directly to the case of internally fertilized multicellular organisms. In this situation, one might suppose that females attempt, via anatomical or chemical means, to prevent males from copulating (and/or fertilizing eggs). Here it seems quite plausible that females might have a greater purchasing advantage (A) than in the previous scenarios, but they should also be at some risk of physical damage from males who attempt to breach those defenses. That physical damage might well affect the viability of the females who attempt that strategy and of their offspring. Again, the prospects of success are dim, and while in this case males might be risking comparable amounts of damage, this should be of little evolutionary consequence so long as such encounters with "dangerously resistant" females are rare. And, as we have seen, males can afford higher losses than females.

So the conclusion remains: it would be harder to reestablish asexual reproduction after sex was the norm than it would be to resist the establishment of sex in the first place. And that may have been so difficult that it did not happen.

Sex could have originated as an adaptation to extreme conditions in which new genes are needed at any price. Selection for production of two kinds of gametes would then have followed, perhaps for the reasons specified by Parker, Baker, and Smith, or perhaps because anisogamy made successful fatherhood possible. In either case, once males existed, females might have been unable to resist the spread of the sexual strategies from conditions in which the costs of sex are "acceptable" for females to the much broader range of conditions in which they are unavoidable because successful fatherhood is possible.

The model indicates that female investment in resistance to sexual reproduction will rarely be cost-effective, and even if it is, as asexual females begin to increase in number, they create a fertile niche which eventually makes it profitable for males (and their mothers) to invest as much as is necessary to breach their defenses (and render them sexual again). Therefore, the fact that females in (for example) internally fertilized multicellular species possess elaborate adaptations designed to accommodate sexual reproduction does not contradict the present account—given that sexual reproduction cannot be avoided, evolution would favor adaptations which maximize its benefits and minimize its costs (including those costs which *would* be imposed by males if females *did* invest in resistance).

Furthermore, as mentioned in Section I sex actually benefits the most prolific mothers as well as fathers. Males who manage to father a disproportionate number of offspring are also propagating their mother's genes; mothers of the most successful males may well have far more offspring than would have been possible through asexual reproduction. This sometime advantage of sex for females has not been incorporated into the present model, but it seems likely that it would bias the contest further in favor of sexual reproduction. It does provide another arena in which male "persuasion" might prevail: one factor influencing the readiness of facultatively sexual females to mate would be the "perception" that a given male is

likely to produce "successful sons" (Fisher 1930; Partridge 1983). Then, male "persuasion" would involve traits which promote that perception in females, while female resistance would require increasingly difficult discriminative abilities intended to detect "bluffers." In this arena, as in others, there is no reason to think that females would have an intrinsic advantage.

The present model makes a number of testable predictions. It indicates that sex will predominate when conditions permit successful fathers to potentially achieve reproductive successes which greatly exceed those of asexually reproducing mothers. These conditions are widespread, but not universal. They certainly obtain in the many large, slow-to-mature, and expensive-to-produce animal species for whom sex is the rule. But some species, especially high-fecundity microorganisms, can clone so rapidly that sex, even for the most successful fathers, is the less efficient way to copy one's genes. In fact, in those species, asexual reproduction is the rule, thus corroborating the present account (but not most other accounts of the evolution of sexual reproduction; see Williams 1975, and compare Hamilton 1982).

Similarly, the success of successful fathers must be limited by the probability that males (and/or sperm) will encounter females (and/or eggs). This will vary with population density and locomotory ability, among other factors, and it is thus worth noting that protozoan and multicellular microorganisms which reproduce sexually as well as asexually switch to sexuality when conspecific density is high. (The extreme case of low population density favoring asexuality would be that in which one or a few individual "founders" arrive in a newly arisen and as-yet-uncolonized environment. In such a situation, asexuality is the only viable option (Gerritsen 1974). Bell (1982) reviews evidence that asexual species do tend to be found in highly variable marine and arctic environments in which new habitats spring unpredictably into existence.) Most of the parameters of our model and their determinants (e.g., population density, fecundity, maximal reproductive potential, locomotory abilities) could be quantified empirically and it could therefore be evaluated through a variety of between-and within-species comparisons.

In fact, the present account is perhaps more testable than other theories of the evolution of sexual reproduction, because it indicates that fitnesses of various strategies can be estimated by immediate reproductive outputs, rather than by the long-term survivorships under environmental selection pressures emphasized by other theories. The best arena for further investigation would be facultatively sexual species in which male-female, and sperm-egg interactions could be directly observed. Although our quantitative formulae would need to be modified to deal with the particulars of any specific system, we will briefly consider the Cladocerans, to show how the present account might be used to guide empirical studies.

In most Cladocerans, females carry eggs in brood pouches, and asexual reproduction is the rule. The advent of sexual reproduction occurs, often in response to crowding, when females begin to produce male offspring as part of a parthenogenetic brood. Sexual, haploid, "resting eggs" are typically larger than parthenogenetic eggs, and are produced some time later (see Banta 1939). The present account suggests that male production should not occur until male reproductive potential (B) can at least match that of asexual females; it would be useful therefore to determine how many females a male can contact and/or inseminate under the

population densities and conditions in which they are produced. We are unaware of any such measurements in a facultatively asexual species.

It would be especially interesting to know what happens when male Cladocerans encounter parthenogenetic females, because it is here that contests over mode of reproduction might be observed. Males are known to be aggressive and indiscriminate with regard to potential mates, and will frequently mount parthenogenetic females, as well as other conspecific male (Goulden, personal communication). If males can occasionally get some of their sperm into these asexual eggs, then something very much like the present account might apply. Even if males "spoiled" most of the parthenogenetic eggs they attempted to fertilize, the attempt might still be adaptive, because sex is relatively cheap for males, and multiple matings are possible. However, for females, the prevalence of "egg-spoiling" males could make the attempt to reproduce asexually prohibitively expensive. Thus, while male-production would become adaptive as soon as conditions made "successful fatherhood" possible, we might speculate that females put off production of sexual eggs until it is made absolutely necessary by increasingly frequent contacts with males (or by extreme conditions). In any case, although by this interpretation of the Cladoceran system, female costs are not independent of the frequency of males (as was assumed in our formulae; cf. Parker 1979), the example does show that there are plausible ways in which males might be able to impose sex on females, and that it might be possible to measure reproductive costs and benefits of male and female strategies under various conditions directly, while observing the interactions which determine them.

Although it is conventional to assume that females should be able to choose their own mode of reproduction, we are no longer convinced that this is correct. Given the conflicting interests of males and females in the domain of sexual reproduction, given the greater selection pressures favoring genes-for-fatherhood as opposed to those favoring genes-for-parthenogenesis, given the results of the present model, and given the failure of conventional assumptions to spawn powerful explanations of the evolution of sexual reproduction, we feel that less conventional assumptions are worth examining. Sex could exist in spite of the fact that it increases genetic variability, not because of that fact. Males could be parasites, and sex a kind of social disease to which much of life has adapted.

IV. GENERAL DISCUSSION

Whether or not our model offers a correct account of the evolution of sexual reproduction, it may well be applicable to other social and political situations in which the potential for conflict provides a context for cooperation. Let us disembard our discussion from the specific problem of sex. We have modelled the not uncommon situation in which two parties have a significant conflict of interest because some members of one party can maximize their own success by exploiting resources produced by the other party. Individuals in each party can invest more or less of their available resources in "armaments" for the achievement of their preferred outcome (exploitation or avoidance of exploitation), and are assumed to increase in

number in proportion to their success at achieving the most individually advantageous balance between “guns” and “butter.”

We find that the situation is chronically unstable, when the “spending ability” of the two parties is of comparable magnitude (the ratio of B to A is not large) and when small increments in “arms spending” can sometimes shift the balance of power (the sharp eligibility functions). Periods of active conflict occur intermittently in which “arms spending” by both parties escalates rapidly. Between these “uprisings,” two kinds of “quiescence” occur. In one case, exploiters exist in only small numbers because they consistently fail to breach their competitors’ defenses. In the other case, large numbers of exploiters exist because they have outspent and outmatched the exploited (who stop investing in armaments at all, which allows the exploiters to invest less in armaments as well). However, under the sharp eligibility function, these states can drift into circumstances in which “slightly bigger spenders” can achieve very big gains, either by purchasing sufficient arms to breach the defenses of the exploited, or by acquiring defenses which prevent exploitation. So another arms race ensues.

These instabilities are eliminated when competitive ability is proportional to relative investment in armaments (the smooth eligibility function) and when exploiters can afford to outspend the exploited (either because they have more to invest or, as suggested of males in the evolution of sex, because they have less to lose). Indeed, in this stable situation, there is hardly any evidence of conflict: the exploited invest nothing in useless defenses, and the exploiters need to invest only a little in armaments for exploitation. Furthermore, the distribution of resources between the two parties ends up being equitable, because exploiters increase in number until the average exploiter’s share of resources is no greater than that of the average “exploitee.”

This predominantly stable and cooperative scenario is not a pretty picture, although it does seem distressingly familiar. Contrary to the arguments of social Darwinists, it is important to note that while the overall productivity of the population is greater than it is during escalated conflicts, it is substantially less than would be the case if exploitation were not occurring. (In the case of sex, the overall productivity of the population is slightly less than *half* what it would be if all reproduction were asexual.)

It would be a mistake then, to assume that a state of cooperation is necessarily a good thing, nor that evolution (social or otherwise) necessarily proceeds toward the “greater good.” Indeed, it is not at all clear what should be characterized as the “greater good.” The present analysis suggests that sex could have evolved even though it is the less effective reproductive alternative for the majority of females (who would be twice as productive if they could clone) or for the majority of males (who are unproductive because they have been outcompeted by a small minority of successful males). On the other hand, while sex may be maladaptive, there is little doubt that it increases the ability of populations to survive and adapt to changing circumstances. This might be considered to be for the “good of the species,” but the real point is that much-abused phrase provides no guidance in predicting or explaining the dynamics of evolution. Nor do the outcomes achieved by evolution provide much guidance in identifying the “goods” worth striving for.

However, an understanding of evolutionary and social dynamics does provide clues as to the conditions which favor desirable or undesirable outcomes (assuming that desirable outcomes have somehow been identified). It is interesting to note for example, that the evolutionary interactions which emerge between the two strategies in this scenario are reminiscent of behavioral interactions which have been shown to emerge in another recent game theoretic investigation of the evolution of cooperation (Axelrod 1984). In that investigation, individual organisms were modelled interacting in a conflict situation (the iterative prisoners dilemma) in which exploitation of would-be cooperators could potentially maximize the success of exploiters even though universal cooperation would yield the highest average payoff of all. (The payoff is by definition, the "good.")

In Axelrod's investigations, the most successful strategy in many circumstances turned out to be one called "Tit For Tat"—respond aggressively to acts of aggression, and respond cooperatively to acts of cooperation. The strength of this strategy is that it punishes and therefore discourages aggression, while rewarding and therefore promoting cooperation. The result is a population of cooperators, which in the prisoner's dilemma situation is also a population which maximizes overall payoff.

Now, the conflict situation analyzed in the present study differs in many ways from the situation analyzed by Axelrod. It is not an iterated prisoner's dilemma, not a symmetrical contest, and the characteristic being selected is not a sequential behavioral program for social interaction among individual organisms. Rather, we have modelled the evolution of a single lifelong investment strategy. Furthermore, unlike the Prisoner's Dilemma simulations, our payoff matrices do not describe a game in which a cooperative steady state maximizes overall payoff. Nonetheless, a cooperative steady state emerges, and by way of a mechanism similar to Tit for Tat, albeit at a higher level of organization.

In the situation studied here, stability and cooperation emerge under the smooth eligibility functions because, in the context of exploiters who can and will spend whatever is necessary to outspend the exploited, natural selection rewards cooperators (because females who invest nothing in resistance) and selects against non-cooperation (females who invest in hapless resistance waste resources which are better invested in offspring). As in the case of the iterated prisoners dilemma, punishment for non-cooperation is contingent upon, and commensurate to, the strength of the non-cooperation. The interesting thing is that this dynamic is not an evolved, genetically encoded strategy as in the Prisoner's Dilemma simulations, but is rather intrinsic to the evolutionary interactions of the situation. Nonetheless the stable evolutionary interactions which emerge are analogous to the stable social interactions which maintain Tit for Tat in populations of individual organisms. Scaling the punishment to the crime (and the payoff to the good deed) may be a general condition for stability in a variety of dynamic systems.

The normative implications of the present model are, however sobering. The iterated Prisoner's Dilemma simulations led to a rather "upbeat" conclusion: there is a cooperative strategy which allows evenly matched players to resist exploitation and promote cooperation which is indeed for the greater good. The present model is less encouraging: a similar dynamic can drive unevenly matched players into a

situation which allows a small minority to obtain cooperation from the vast majority. This is not an entirely unfamiliar scenario, and the model may provide some insight into how it may come about. However, further analytical and empirical research will be required before we can identify the biological and social realities to which it actually applies, and the ways in which we might influence them.

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PART FOUR

Deep Ecology and Ourselves

In this book the term *cooperation* is used in the largest possible sense, not just to include human or even animal interactions, but also the dynamic interaction between the human species and the ecosphere itself, of which humankind is only a part. In the first essay of this section, poet and essayist Deena Metzger gives us a profoundly thoughtful inquiry into the subjective resonances of physical and environmental diseases, seeking the dimensions of healing. Following this, geologist Thomas Berry considers the present state of the world, focusing on the relationship of humankind to the larger biological community of the planet. His ideas are beautifully reflected in terms of human cultures in the thoughtful essay by writer and ecofeminist Marnie Muller.

CHAPTER 15

Healing the Planet/Healing Ourselves

DEENA METZGER

It is 1992. We are living in great jeopardy. Medical science triumphs and new mysterious and intractable physical illnesses appear. Living standards and conditions improve, and those who seem the strongest and most fortunate succumb suddenly and without warning to life-threatening or debilitating diseases. The cells rebel, defense systems break down, ennui and exhaustion set in most unexpectedly, surprising many at the very peak of health and activity. Malnutrition, over consumption, over work, erosion of private time, overproduction, exploitation of resources, foreign invasion, failure of defense systems, despair, delusion, toxicity, pollution, affect us intra-psychically as well as politically. Willy-nilly, the borders we try so hard to sustain become permeable and distinctions disappear. Individuals begin to suffer the conditions of the nation-states. Nation states develop their own equivalents of physical diseases. We take the afflictions of the planet into our bodies as the planet suffers our conditions.

The diseases we suffer are also metaphors. That is, diseases are presenting themselves in personal as well as political and social metaphors. While it has always been clear that physical illness is often a consequence of world conditions, it has not been so clear that physical illness is an *analogue* of planetary conditions. This being the case, preventing or healing physical disease becomes a political act. And, preventing or healing political, social and environmental conditions ameliorates physical illness.

Imagine then that disease is a language, an alarm, a desperate code, written on the body to alert us to the dire situation of our psyche, the polis and the planet.

I also would like to heal something on this planet, a bit of earth, a lost soul, even myself.

Twelve years ago, I had breast cancer and took a typewriter to the hospital because I had learned through writing that the silence in me contributed significantly to the onset of this disease. I was determined to be silent no longer, to look for the hidden silences which unbeknownst to me had become lethal.

Months before I discovered I had cancer, I was writing a novel about cancer and women, *The Book of Hags*. There I postulated that cancer was silence turned against itself:

The women who had died of cancer, had all tried madness first and their madness had been plastered up, sealed, glassed in, submerged. Then they lived a few years and

cancer erupted which could not be submerged, ignored, boxed in, cut out, irradiated or controlled in any way. It was a fierce raging growth and it took their lives.

While writing, I had had a dream about a woman torturer, working for the *DINA*, the Chilean secret police. [Dina, is, of course, a variant spelling of my name.] When I discovered I had breast cancer in 1977, one month after I finished that novel, I began to examine that dream anew. It had something to do with the disease, but what? Something was torturing me, but what? Who? Why? To keep me silent and acquiescent? Why was the image a woman? Was I, myself, the torturer, the silencer, the one who did not want her victim to know, speak or live?

During the last twelve years of health, while always aware that our destructive relationship to the environment is immediately translated into a rash of physical illness, I still continue my relentless search for the places in my psyche which make me even more vulnerable to the onslaught of disease, to the places of unconscious collusion with the destructive forces, to the places where the potentially lethal torturers and silences within myself reside. No matter what answers I find, I continue to pose the questions: What is lethal within me? What is festering? What is repressed? What must be spoken?

Each year something astounding, even horrific, which has been suppressed, emerges. Then I try to ease it—my form of psychic surgery; I prefer it to the operating room.

When I first considered the incident of a dream, or the metaphor of disease as an essential and serious map for the healing process, I stepped into the reality of the imagination. This became a significant part of the healing process. To value the images, to speak out, to find what is lethal within, to come out of silence, to honor the creative and the imagination as real worlds—these have been my life and healing work.

Perhaps the surgeon cured me. I think he did. But I had to *heal* myself. Cure is a state, health is a process. Curing is finite, healing is ongoing. A cure is singular, healing is a practice. This is why healing requires that we change our lives. In the ways we find to live differently, we eliminate or neutralize some of the conditions which contribute to the creation or maintenance of the disease. And, not ironically, as we change our lives for our health's sake, we often begin to live lives which are far more compatible with the health and survival of the planet.

When I began working with cancer patients, I wanted to see if we could find ancillary ways to approach cancer, as Western medicine, by itself is insufficient. By now, it occurs to me as I have begun to see the inextricable relationships between the illnesses in our bodies and the illnesses affecting the planet, that healing the individual patient, when it is possible, is insufficient. In order to heal our bodies, we have to undertake the healing of the body politic. And as we suffer from the same illnesses, the same remedies apply to both. The very process of preventing or healing or personal illness extend themselves to healing the world. And vice-versa.

What was most surprising to me when I had cancer was discovering an alien voice in me speaking against my own life. Some years later, I find it is not uncommon.

Inner despair, rage against oneself, self hate, are the frequent hand maidens of physical illness. Many of my clients with Epstein-Barr, Chronic Fatigue Viral Syndrome, or other immune system diseases, have experienced debilitating depression and the sudden or gradual erosion of the will to live as a biochemical consequence of the disease. This emotional consequence is sometimes experienced as the worst of the symptoms.

Similarly, when I look about me at the dire planetary conditions, I find that many people no longer care whether life itself goes on. We are suffering from global fatigue and despair, from cultural self-loathing, from national suicides, all of which leads to serious increases in attacks against life itself. The parallels are unnerving. As we hold the world pain in our own physical bodies so the body politic comes to live out our physical illnesses—we have created an awful fellowship in despair.

The core of the issue may be that the will to live, individually and globally, is being replaced by the will to die: Thanatos triumphing over eros. We can postulate the causes: alien virus, alterations in the DNA, aberrations in the immune system responses, as well as the brutality, futility, meaninglessness, alienation, exploitation, poverty of modern life; these are legion. And these conditions are intensified by the subtle love affair Western Civilization has always had with death: Death the redeemer; Death the phantom lover; the dark God.

In 1945, the Atom Bomb was exploded in response to the Nazis' murderous frenzy. J. Robert Oppenheimer, himself a Jew, watching the first Bomb test at Trinity quoted Vishnu in the *Bhagavad-Gita*: "Behold, I am become Death, destroyer of worlds."

The cures we have found for our circumstances perpetuate the illnesses.

The end of the century feels apocalyptic. Threats of war, genocide, torture, chemical warfare, nuclear disaster, radiation poisoning. Illness everywhere. Environmental diseases and environmental devastation. A variety of plagues and scourges.

And now this dilemma: The plague comes home. Cancer, Aids, CFS, emotional and physical exhaustion become commonplace, affecting, among many others, many of those who have committed themselves to confronting the dread koans of this century: genocide, nuclear destruction, environmental devastation. We do not seem to know yet how to confront these without ourselves being severely jeopardized. While the suffering in the world is extreme and must be alleviated, we are not finding the strength and knowledge to confront it. The capacities of our psyches and bodies are not increasing proportionally with the escalation of emotional, moral, political, spiritual, and ecological crises.

Consequently, it is urgent that we ask ourselves how to do the work we need to do while maintaining a state of health at the same time. And if the analogies hold, perhaps in learning how to maintain our personal health, we will discover how to maintain the health of the planet. Perhaps, then, this specific approach to healing is the significant task of our time.

Recently, three out of five speakers had to cancel their participation in an important conference in Women's Spirituality because of extreme fatigue or illness.

A fourth, myself, had had serious doubts about attending—also for reasons of health and exhaustion. Though it is clear that none of us will survive if the collective does not survive, still we must be aware of the growing number of people who, undertaking healing work are, themselves, being thrown into serious physical crises.

Needless to say, all of us, living in these times already suffer serious wounds and weaknesses. This means that a further health crises may precipitate extreme conditions. Further, the nature of many of the more common illnesses are not only chronic but so undermining that it is often impossible to take care of oneself. The seriousness of this is compounded by the fact that many people now live alone.

“Perhaps,” I said speaking to a friend, “your work is not only your research on the causes of war. Perhaps your work is larger than that. Perhaps our work is also to find how we can protect ourselves against disease, to find out how to do this work without being overwhelmed by illness.” When I suggested this, I was aware that I was adding another imperative to an already overwhelmed situation.

My friend was suffering from a breakdown of her immune system. The analogy with our political situation was unavoidable. Her immune system wasn’t working. Militarily, our immune systems—defense systems—also do not work. These days, we are far more injured by them than protected. Clearly then it is in our personal as well as collective interest to address these synchronicities.

Individually, and nationally, we are discovering that we cannot isolate ourselves from outside forces, from ‘the other.’ We cannot keep ourselves from being invaded. Even if we keep large armies at bay, we can not protect ourselves against terrorists or economic and cultural take-overs or infiltrations. Borders mean very little if anything. Our resources are consumed in the attempt to build up our defenses. Our stockpiles, weapons, threaten to turn on us before we use them. We cannot launch an attack to destroy the enemy without seriously injuring ourselves. Every time we think of launching an attack, we are ourselves jeopardized by that action. Every enemy we make endangers us. The myriad forms of ‘friendly fire’ besiege us on all fronts, Chernobyl, Three Mile Island, T cell imbalance, being only three instances of them. Death hovers at the edges of our imagination.

When I first started working and consulting with people with cancer and other serious diseases—and afterwards when I discovered that I also had breast cancer—I found that it was possible to translate an understanding of the illness into personal metaphors. While for each person, the metaphor may be different, the impact or relevance of metaphor itself remained consistent. While for one person, throat cancer represented her untenable silence, and for another, thyroid cancer represented an inability or unwillingness to regulate energy, and for a third, stomach cancer translated into greed, I, additionally saw cancer behaving much like a modern world power or nation state. An essentially weak, immature, uncooperative dysfunctional cell invaded and occupied near-by or remote territories, dislocating the inhabitants, destroying the area, parasitically devouring the resources, providing no exchange whatsoever until the entire territory was devastated and the inhabitants died of starvation, suffocation or toxicity.

“This is imperialism,” I said. Then I began to look for political approaches, for the causes, signs and manifestations of imperialism within myself which might later

alter and consequently heal. Admittedly, I could no more find an instant cure with this approach than we have been able to establish instant peace or economic equality, but it provided other real arenas for investigation. Ultimately I did find ways in which one part of myself improperly dominated others, in which inner resources were used up without regard, in which alienated economic and cultural plagues overwhelmed the more sustaining native traditions, in which my energy was depleted without regard for the body, spirit which sustained it. This approach caused me to change the way I was living and thinking, and therefore, most importantly, empowered me to participate in my own healing and allowed for the use of the imagination in pursuit of health.

Similarly, when I began thinking about AIDS after working with several clients with that illness, I began to see it, metaphorically, as the demise of the defense system which had been undermined, even taken over from within, leaving the body unable to defend itself, a victim to any scourge. If a new defense system cannot be instituted, or as is frequently happening with the increase in auto-immune diseases, if the defense system itself turns against the host, it is necessary that we learn to live with the foreign body. Perhaps a change of definition—relinquishing the concept of enemy—will allow for healing as/through co-existence. Or perhaps, as we watch the invading cells recoding our own DNA until there is no difference between our cells and the invader, we will invent ways to co-exist with virulent aggression without losing our own integrity. Not to make enemies and not to become the enemy. Even for the sake of our survival.

This kind of thinking may seem simplistic and I do not assert that we are yet sophisticated enough to be able to heal ourselves completely by using such an approach. Nevertheless, it is clear that we can make a difference in the length of time we stay healthy, in the severity and speed of the disease. Very often, mediation, reconciliation, co-existence with what was formerly defined as the enemy—whether it is something within our psyche or whether it is someone or some condition external to us—can also alleviate or relieve some of the physical symptoms we are suffering. For example, dismantling the rage which generally consumed him and the consequent state of ‘red alert’ in which he lived, made a significant difference in the T cell count and state of health of one of my clients with AIDS. The reduction of enemies without seemed to translate into a reduction of enemy cells within. Therefore, one approach may be to give up the idea of an enemy or it may be to come into relationship with that which we have predicated as “other.” If we can’t set up barriers against what we fear, perhaps we can find a complex way to be in a safe relationship with it. Equally important is the necessity to maintain oneself despite the virulence of the invasion. The Dalai Lama once instructed one of his delegates to Mao’s government that he would not be effective until he stopped hating the Chinese. The task, then, was to give up hate without in any way relinquishing Tibetan culture and practice.

Most of what we are suffering socially and politically is due to each of our accommodations to ways of life which are unhealthy in every sense, physically and morally. Not one of us is free of the stigma of collaboration with some of the worst aspects of industrial and post-industrial anti-culture, including the making of

enemies, the relinquishment of ourselves and the acceptance of alienation from nature. Therefore it is no surprise to see how frequently health occurs as individuals free themselves from the life-style of these anti-cultures. The attempts we are witnessing among many people to return to a life style compatible and interactive with nature cannot be dismissed as romantic. The fact is that retreat from contemporary life is promoting healing in many people. And for those who remain within the society, maintaining an alliance, with nature, even if only in the imagination, despite the proximity of anti-nature forces, can often mean the difference between health and illness.

Multiple sclerosis can be understood as a disease in which the defense system attacks itself like a munitions or nuclear plant exploding in its own territory, or a unit being bombed by its own planes, friendly fire. Or an illness in which essential communication is stymied because of a break in the line, the ability of one part of the system to receive a message from the other part of the system is impaired.

Asthma can be understood as illness in which the air taken in can't be given out, the bronchial tubes which must open, close down, the essence of the life force is perverted, so that one suffocates in the very air that can't be released. It is a mirror of what happens in us when we resist the creative, take in but do not release, are inspired but fail to express. An action dramatized in the body which is a pattern in the society. It is also like the segment of the population which co-opts and hoards essential resources, the water, for example, taking in without giving out, closing down to others, without realizing that vigor and balance are eeking away, until the very life of the country is threatened.

Likewise, those suffering from Epstein-Barr who are physiologically afflicted by unrelenting terror and despair and extremely diminished vitality, re-experience in their own bodies the circumstances of the modern condition. And further, it has become clear, working with clients, that rest and diminishing activities do not relieve the chronic fatigue. Often, I have found, what begins to promote health and recuperation is not the abdication of activities, but rather the willingness to engage in strenuous activities which are vitalizing and to suspend those activities, no matter how 'necessary' or 'sensible' which sap the zest of the individual. Enthusiasm, [to be filled with the god] passion, creative expression are often the unexpected medicines for this illness.

Similarly, we can see the political or social equivalents of a heart which is attacked, bruised, broken when access to it is impeded, when the highways to the heart are blocked, when the activity of the heart limited. The metaphoric is not only a description, it is a diagnosis.

Sometimes the dilemmas of our own personal lives are enacted in our bodies and sometimes the dilemmas of the body politic are enacted in our bodies, and sometimes both. In each case, internal imperialism kills, imbalance is lethal, terror is rampant, communication breaks down, paralysis occurs, our defense systems become obsolete, too expensive or turn against us. Diseases are mirrors of prevailing political, ecological conditions. They are microcosms enacted in the human body, in ourselves, of larger events being enacted on the social, political and earthly body.

To heal ourselves is a rigorous and difficult as healing our societies or healing the

planet. Healing the body requires exactly what it takes to heal the planet: a major, serious reorganization, if not total change, of one's life. This is where we see the intractable hold which Thanatos has upon our individual and collective psyches. Those old but not wise ways, familiar and habitual, so-called safe, socially sanctioned, economically expedient, culturally proscribed ways which manifest clear and evident dangers hold fast within us nevertheless. It sometimes takes an action as extreme and violent as the illness itself to wrest ourselves free from the very 'beloved' conditions which are killing us.

I want to say a few simple but urgent things here. First of all, these images and metaphors are not absolute. My experience is that healing occurs or health is improved when the individuals commit themselves to finding the metaphors which are the perfect analogues for the nature of the illness which have afflicted them, their own psychological issues and the conditions in the world at large. The more particular and specific the analogue, the greater the opportunity to heal the condition.

Secondly, when I speak about disease as a metaphor, I do not mean that we bring it upon ourselves. Genetics, environmental toxins, bacteria, viruses are real things to which we fall victim. To blame the ill for their disease, to assume they did something wrong or did not prevent it from happening or did not respond appropriately, is as pernicious and naive as blaming the rape victim for the rape or the holocaust victim for the Death Camp.

Still, working with the metaphor of the disease, seeing how the symptoms resonate within, empowers us to act upon our own behalf. Sometimes unbearably helpless against the already overwhelming disease-creating conditions of our society, we find ourselves capable of mobilizing heart, mind and spirit to participate in healing what might otherwise remain a grave condition. But in these cases, it is essential that people determine what the metaphor of the disease is for them and work from that.

Disease is a desperate story which the body tells in the hope that we can act in such a way to change our lives so not to lose them. On a personal level, if we can find the individual story the disease has enacted in us, we have a chance of changing the story, of finding the healing story which may save our lives.

What I am saying is this: These images are realities of the imaginal world. They are acting upon us in our daily lives. To give them credence—without attributing full responsibility for the conditions—is one step toward giving voice to what has been stifled in us, and beginning on the road to health.

There is another aspect to this, and it is also part of the healing. First cancer, then AIDS, and now the rash of immune system diseases, have forced us to create healing communities. Families and communities otherwise severely alienated and distracted from each other often find that the imperative of cancer draws them together and that somehow the individuals who care for the person are healed themselves, especially from their alienation. The kind of camaraderie we have seen in this century in resistance movements, solidarity movements, civil rights and women's movement etc., now occurs in the home. One sees this most vividly in the Gay community as it confronts AIDS. Person after person seems to become the

recipient of a kindly communal care which is involving everyone. Many people who for one reason or another were forced to give up children or family find themselves, not ironically, gaining their lives, not in child-rearing, but in the equally momentous task of attending someone who is dying. These death watches have become the most significant form of life affirming, soul-making in our society.

In these times one factor after another forces us toward isolation, self-centeredness and self-absorption in our own lives. Ambition and the profit motive daily erode what we used to rely on as fundamental human values. Caring, empathy, and interdependence are too often dismissed as the illness of co-dependence. Those values which tied individuals, families and communities together have all but disappeared in the complete global demoralization since Guernica and World War II.

To be challenged by the absolute necessity for community and mutual caretaking is a dreadful blessing. The incontrovertible need to take care of each other, to cherish what is precious, to tend what we love, are joys to which extremis demands we return.

The core of this global issue is the will to *Life*. The will to life as distinct from our own individual or species will to live, distinct from the uninformed individual and species reflex to persist or survive no matter the way or the means or the consequences.

The will to Life and the values of Life. To live our lives devoted to the life force, to this planet, to nature, to what is green, is a shift of the most radical order.

Some years ago, I dreamed the earth had been devastated by nuclear war. In abject despair, I contemplated suicide, but a Voice demanded, "Have a child. New life! New life!"

Every day, I confront the tendencies inside myself to deny Gaia, to have other gods before Her, to diminish, trivialize and undermine zest, passion, play, solitude, idleness, contemplation, creativity, fertility, my love of the outdoors, the tenderness for the green things. Consciously and unconsciously, we need to come to the moment when we say, "We have become Life!"

So we have been given several tasks. First and foremost, we have to care whether we will live or die, to change our affiliation with death for an affiliation with life. Second, to make an affiliate of the enemy so that we can live in the larger world without being poisoned, overwhelmed, invaded by what comes toward us is once again a task of highest priority.

Ethics, the oldest of philosophic concerns, long ignored in this half of the century, returns now as a constituent of the healing arts. How we live our lives, how we act toward ourselves and others, how we treat the environment, how we regulate our inner lives, has become of crucial relevance to our physical health. Finally, how we live as moral beings directly affects how we live as physical beings. The health of the soul and the health of the body—and the health of the planet—have become as one.

CHAPTER 16

The Emerging Ecozoic Period

THOMAS BERRY

In biological terms the planet earth is at the end of the Cenozoic period. This period is being terminated by the industrial economy that humans have imposed on the planet during these past two centuries. In this context the major life-giving systems of the planet, the air, the water and the soil, are severely diminished in their life-giving capacities.

To establish a viable situation for the earth community requires a transition from the Cenozoic to what might be termed the Ecozoic period of Earth history. The Cenozoic is that period of the evolution of the living systems of the Earth that have developed over these past 65 million years and which are being extinguished by our present industrial economy. The Ecozoic is the emerging period of the integral life community, the fourth in the sequence of life periods that are generally designed as the Paleozoic (600–220 million years ago), the Mesozoic (220–65 million years ago), the Cenozoic (65 million years ago until the present). The “Ecozoic” is a newly invented term as a possible designation for the newly emerging period.

Before giving a full description of the Ecozoic period and the historical role that it is called upon to fulfill, we must first appreciate the Cenozoic period in the full grandeur of its creativity, in its role in bringing the human species into being and providing the context for the unfolding of human life until the present.

The Cenozoic could be considered as the lyric period of the evolutionary process, the period of the flowers, the birds, the mammals. For 65 million years, wave upon wave of life appeared. Then came the human. Hominid types appeared some 3 million years ago, types that died out long ago. The appearance of humans from which we can trace our own descent occurs some 60,000 years ago. This early human period, culturally identified as the Paleolithic, or Old Stone Age, lasted from 60,000 years ago until some 12,000 years ago when the Neolithic, or New Stone Age, appears in this unfolding process.

Until recently we have considered this Neolithic period of permanent village settlements and the domestication of plants and animals as, unquestionably, an admirable achievement on the part of the human, the moment when we began to be human in some full sense of the word. We did not see the dangers inherent in this domestication process. This was a movement of humans to take control of the spontaneous processes whereby the various life systems of earth were mutually supportive and underwent their seasonal renewal each year. The danger was that humans would seek to impose their mechanistic processes on the biological functioning of the natural life systems, mechanistic processes that would eventually, in the 20th century, be extended until these controls were felt throughout the entire

planet. True wilderness, true independence from the human, would be severely diminished, if not obliterated.

Even more than a reassessment of developments in the Neolithic period we need to reassess the Civilizations that came after this period and which have dominated the planetary process over these past 5,000 years. These civilizations provided the context for that vast expansion of the human realm. The great cities were built, human learning was expanded, the arts developed, roads were built and commerce expanded. The great religious centers evolved, the temples built, the ceremonies made ever more gorgeous in their expression. All this went with a pervasive human arrogance in relation to the other members of the earth community.

We need especially to rethink the sequence of events that have taken place in the western world during the past few centuries, the period that we have designated as the period *par excellence* of "progress." During this period dominated by the ideal of "progress" we developed our scientific understanding of how the earth functioned and how it could be controlled. We withdrew from our intimate relations with the natural world and increased our controls over the rhythmic functioning of the planet. Enchantment with ourselves and our supposed betterment of the human situation did not permit a critical appraisal of just what we were doing in the larger pattern of earthly affairs.

The Neolithic period, the Civilizational period, and our modern period of progress, have so far been judged, not by their effects of the integral functioning of the planet, but by advance in our human controls over the Earth, by our rational understanding, the abundance of our food supply, our control over illness, our consumer satisfaction, our capacity to travel more rapidly from one place to another, by our capacity for communication. We judged progress by its benefits for ourselves.

We were insensitive to the effects this was having on the natural world. We built our dams for electrical power and thus profoundly disturbed the flow of the rivers. We forced the soil to produce, not according to its own rhythm, but according to the demands we made through our chemical fertilizers. We took the petroleum from the earth and used it for heat, energy, fertilizers, plastics, fibers, and a multitude of other uses, little realizing that we were disturbing the wonderful balance of the elements that nature had worked out over the millennia. We paid little attention to the effects that would result from the carbon and sulphur compounds that we were pouring into the atmosphere.

Suddenly in these late decades of the twentieth century we are becoming aware of our profound disruption of the natural world, the extinction of species, the killing off of the rainforests, the pollution of the airsphere and the watersphere as well as the landsphere. All this is now coming under judgment.

The supposed higher development of our human mode of being through our humanist arrogance and our religious fixations is being reexamined. Their effects on the planet, its life systems, and even on ourselves must now be reevaluated in terms of what is happening to the planet on which we live and on which we depend absolutely for survival.

We have indeed gained in our empirical knowledge of the universe in terms of its physical functioning. We know the physical structure and functioning of the universe and of the planet earth as no other age has known the natural world about us.

But in the process we have become autistic. We have lost our capacity for communication with the natural world in its inner life, its spirit mode. We find ourselves illiterate as regards the languages of the natural world. We do not hear the voices of the trees, the rivers, the birds, the mountains, the animals, or the insects. We have become a death-dealing presence.

We now have a new task before us. We must completely revise our understanding of the earth story, the life story, the human story and the western story; for indeed our new situation reveals the true reality of what we have been doing. It reveals the dark powers of both the humanist and the religious traditions of our western world, powers that have now been communicated throughout the entire human community. Even beyond this it reveals the dangers to itself that the earth brought forth in producing the human species.

This danger was in the termination of the magnificent florescence of the Cenozoic period. That danger has become a reality in this late twentieth century.

The Cenozoic is definitely terminated. The life systems that were so significant in this period are now so severely damaged that they are no longer capable of continuing their successive waves of creativity. They are all in a state of regression. Our biophysical planet is under assault in its every aspect.

Yet neither earth-history nor human-history is yet concluded.

There is a future that is taking shape. A movement toward the healing of the earth can be observed even amid the many devastating processes that are still functioning. As we rewrite the story of the past and consider the realities of the present we have already begun the shaping of the future.

As we proceed with this immense task we need to recognize both our limitations and our possibilities. We cannot make a blade of grass, but there may not in the future be a blade of grass unless it is willed by us, fostered and protected by us. There is a vast disproportion between our destructive and our constructive capacities. Although we can do almost nothing creative in the biological order ourselves we can severely damage the entire biosphere of the planet. We can eliminate an immense number of species. We cannot create anew any enduring species. The millions of species in the Cenozoic period were brought into being independently of any human influence.

A primary aspect of the Ecozoic period is that we recognize the larger community of life as our primary referent in terms of reality and value. This locating of the higher reality and the higher value in the larger community is absolutely primary. All species must be granted their habitat, their freedom, and their range of life expression. The more complex life systems are proportionately more rather than less dependent on the simpler life systems. The simpler forms can generally survive the elimination of the more complex forms, but the more complex forms cannot survive without the simpler forms. If the plankton in the sea cease their functioning, the multitude of living beings on the planet will cease to exist for lack of oxygen.

So with the bacteria in the soil. If the bacteria cease to function, then the soil will not be able to produce the foods needed by the various forms of life. So with the worms and the insects. These perform immensely important roles in the single web of life; they deserve full recognition for the role that they fulfill.

All the human professions must recognize their prototype and their primary resource in the integral functioning of the earth community. The natural world

itself is the primary economic reality, the primary educator, the primary governance, the primary healer, the primary presence of the sacred, the primary moral value.

In economics it is clear that our human economy is derivative from the earth economy. To glory in a rising Gross National Product with an irreversibly declining Gross Earth Product is an economic absurdity. The only viable human economy is one that is integral with the earth economy.

Education is already late in its revision but we can expect that it will in the future be extensively altered. Education will be defined as knowing the story of the universe, of the planet earth, of life and consciousness, all as a single story.

In our governance we are moving from a limited democracy to a more comprehensive biocracy. Already we can envisage a constitution not simply for humans on this continent, but for the entire North American community. A beginning has been made in the legislation requiring environmental impact statements before any major project affecting the environment can be undertaken.

Already the medical profession begins to see that well-being of the ecosystems of the planet is a prior condition for the well-being of the human. We cannot have well humans on a sick planet, not even with all our medical technologies.

Religion begins to appreciate that the primary sacred community is the earth community itself, that the human community becomes sacred through its participation in the larger planetary community.

In mortality we are expanding our moral sensitivity beyond suicide, homicide and genocide to the include biocide and geocide, evils that were not recognized in our civilizational traditions until recently.

The sciences and the humanities, business and religion, the arts and sciences; all these divisions of learning are overcoming their isolation from each other. Even though the distinctive roles of each need always to be recognized, they will in the future become much more integral with each other. But all our professions and institutions need to be appreciated in the light of the single story that governs the entire earth as well as the entire human process.

We begin to rethink the structure and functioning of our cities. No longer will we endure without protest the oppression of the automobile as the primary factor in our city architecture. Already cities are being redesigned to bring the streams above ground rather than condemn them to flow through our sewers. Our cities begin to be places for habitation not merely by humans but also by other life forms. We begin to make provision for the birds and the various animals that are proper to the region.

Earlier we were concerned simply with our own limited area. We withdrew from the major forces of life into the realm of our own limited controls. We developed our individual self with a neglect of our community self, our relation with the planet earth, and with the entire natural order that constitutes the larger self of our own being.

As the Ecozoic Era comes into its full expression the healing of the past and the shaping of the future are becoming more effective. The possibilities and the promise of the future become clear. As we finally become familiar with the language and the wisdom of the winds and the sea and the land and all the unnumbered forms of life that form the great community of the Earth, we finally realize that we are Earthlings, that we are born out of the Earth, that we have no future except within the larger earth community.

CHAPTER 17

Reflections on Growing Peace in Cultures

MARNIE MULLER

The universe itself can be turbulent, tumultuous . . . so whatever peace is, it needs to acknowledge that dimension of reality. Birth and death and dying . . . and composting . . . and change exist in the universe . . . so that, too, needs to be included in an imaging of peace. Female and male exist in the universe . . . other species exist . . . the earth itself warrants our attention . . . so peace, if it is possible, needs to acknowledge and honor all those relations.

And dreams exist in this universe . . . and memory . . . and our interior psyches . . . and love . . . and absence of love. Can peace accommodate the range of all that? When I stretch the boundaries of my mind and heart and each time say “that, too,” somehow peace stays with me, and so I wonder as to its nature and origin.

As I delve into my concept/language reservoir, the closest thing that I can say peace is, is “to be integral with.” Being integral with someone, some thing, some element, means that I participate in a shared existence with it, and appreciation of that shared existence for me contains the possibility of shared peace.

For peace to be more than just a personal experience or an event between two entities, it is essential to look to the scale of the socio-cultural. It is here that our human stories unfold. Culture, I think, is best thought of in its most literal, biological sense, as a medium in which to grow something, such as bacteria. It seems that the tendency towards culture is inherent in our very make-up. Here we are, a species that has flourished in community-forms for hundreds of thousands of years, and preceded by an even more ancient forming of single-celled organisms into multi-celled ones. We seem to be truly creatures of culture.

Thomas Berry talks about transgenetic cultural coding. The passing on of “deep information” is an essential aspect of the function of any culture. Diversity among cultures can be astounding—language, foods, colors, designs, sounds, songs, instruments, dances, ceremony, architecture—but the *transference of information* is a common feature. Does, as Thomas suggests, our cultural coding pass on information in a way as *elemental* as chromosomes do?

Does our consciousness have an active part to play in the process of evolution? Can we in fact nurture or craft intentional cultures that enhance our participation in the planetary process? Thomas speaks of the universe as having a psychic dimension from its very inception. Not an additive nor an extra ingredient, it is rather, he insists, an elemental facet of the physical universe. So let us say that the universe, from the beginning, has been psychic to itself—*through* itself. The ques-

tion becomes, can humans participate in this elemental dimension? Can human cultures consciously incorporate the recognition, utilization, and celebration of this full reality?

It is at this level that we begin inquiring about the possibilities of peace. The universe constantly informs itself. Can we humans be “informed”? It seems that one of the roles of an organically functional culture is to enhance the individual’s ability to hear the “information” of the universe.

Western culture’s deafness and myopia towards this “information” seems to have occurred because of a limited recognition of the depth of the natural world, seeing it as mere landscape and inanimate treasure trove. The possibility of communication, much less for communion, has thus become practically impossible. Yet it is precisely here, in the realm of human-earth relations, that much cultural healing needs to take place. Our psyches need to reconnect in a one-to-one correspondence with these deep psychic influences of the universe, renewing a sense of bondedness with the natural world.

Our relations among ourselves are intimately interwoven into the fabric of the universe. Unless we explore and acknowledge that connection in all the facets it presents to us, we will remain isolated and enclosed, incapable of the exuberance required for ongoing “relationship” of any sort, whether human-to-human or human-to-earth.

The information of the universe reveals itself in many ways, but one of the simplest, closest ways, is to listen to one’s homeplace, to the entire ecological life community in which one’s own human community is immersed. “Being integral with” suggests the need to experience a sense of the natural scale of things so that we can more fully and appropriately “be integral with” all the varied levels.

In terms of ecological scale, it seems that human culture can best relate to the natural world at the level of the regional scale. Going beyond the neighborhood or cove—beyond the local—one comes to the regional. It is here that one can notice whole ecosystems at work (or at play). Watershed, geological formation, similarity in plant and animal species, all these are best comprehended at the regional level, which has its distinct though “soft” natural boundaries. A region is walkable, knowable, and in crafting human systems to interface with the ecological systems, it is this scale that it makes most sense to “be integral with.”

Encouraging accurate and full perception of reality is critical in developing cultural modeling systems that will function adequately. The mark of a stifling culture, it seems, is one in which the range of shared perceptions of reality remains restricted; one in which, for example, the many ranges of red are referred to only as “red,” thus ignoring the myriad hues of that family of color. A restrictive culture relegates dreamtime to the realm of the subordinate and grants nonexistence to all but a meager spectrum of sounds and senses. An alive, functioning, organic culture, on the other hand, nurtures the individual’s faculties of perception, and encourages a sense of rootedness in a reality that embraces both the human world and the world of nature.

Encouraging the development of accurate feedback mechanisms within the infrastructure of a culture is also essential. If a culture does not allow for appropriate feedback, then a lack of internal vibrancy occurs, promoting fossilization of

thought patterns, activity, and environs. Specific manifestations of culture such as architecture, road building, commerce, food production, communications, banking, and governance, become rigid and unduly reinforce the status quo.

How can a culture allow for a sense of fluidity as well as solidity? How can we come together in community-forms without domesticating ourselves to death—as well as the planet? How can we, not just individually, but in a cultural sense, acknowledge the whole, rich, diverse range of depths of the natural world as well as the human psyche? It seems the more in touch we are with a sense of bondedness to the wider Life community, the more access we have to a resolution of these questions.

Exchange between humans and the natural world takes place at every level, whether we acknowledge it or not. Our breathing in and our breathing out, our intake of food, and our release of wastes, as well as our many other functions, tell us clearly that we live *in* the planet, not on it, and that we are *a part* of its total dynamic process, not separate from it. How can we nurture the growth of cultures whose infrastructural designs acknowledge this intimate participation?

Cultures usually reflect a *human* heritage, but it is essential that they come to reflect an ecological heritage as well. An intimacy of human existence with the natural world needs to be recognized not just on the biological and chemical levels, but also on the psychic/spiritual. Our sense of personal and cultural identity must incorporate the ecological dimension. Only when we begin to understand and encourage these “conditions” for peace, can we come close to growing peace in cultures.

USEFUL CONCEPTS FOR GROWING PEACE IN CULTURES

Respect for diversity. Extinction of species as well as extermination of ethnic peoples has become a severe threat throughout the planet. In addition to ethical considerations, homogeneity and the diminishment of manifestations of life are biologically unwise. The health and stability of any system, whether human or ecological, rest on a genuine respect and celebration of biotic as well as cultural diversity.

Beyond dominance. Many cultures have become entrenched in a “dominion over” paradigm as is evidenced in terms of gender, race, ethnic heritage, species, and age. This posture causes physical, psychological, spiritual, economic and environmental suffocation. A more balanced, equitable, and dynamic model is required, one in which mutuality is the basis rather than force or coercion.

Cooperation. No longer does rugged individualism or Darwinian competition provide an ultimate model for survival. Cooperation and symbiosis are now being recognized as essential aspects of our biological heritage. Cooperation, co-existence, and conflict-resolution need to be at the heart of a vibrant culture. Values such as empathy and teamwork also need reclaimed.

Appropriate scale. Dimensions of scale occur throughout the natural world from the microscopic to the macroscopic. Scale is also important in terms of human activity. In fact, it is an essential element in designing for quality of life—whether in terms of technology, economics, architecture or any other area. Emphasizing

appropriate scale encourages the shift from a highly centralized and hierarchical mode to one that supports diversification and decentralization. It also nudges us to reevaluate the basic arguments for centralization such as national security, economic stability through colonialism, homogeneity and cultural superiority. We begin to recognize the need to explore human-scale, village-scale and region-scale models.

Appropriate governance. All inhabitants of a community have rights and are entitled to participate in decision-making that concerns their well-being. Governance, in particular, is directly affected by scale. We are reflected by and reflect our surroundings. If the boundaries are defined in too large a scale, then it is difficult for inhabitants to sense themselves as a part of and participating in a self-governing process. Determining basic scale; the level at which decisions should be made (community-based, regional); and the type of process to be used (majority rule, consensus, etc.) are all part of a culture's restructuring towards self-governance.

Opportunity for right livelihood. All inhabitants are entitled to the opportunity for securing food, shelter, clothing, etc., without jeopardizing their own well-being, that of their fellow inhabitants or that of the environment. Emphasis on community-based economics can encourage this kind of responsible design and decision-making. Developing an economy that recognizes its dependence on the "earth economy" allows for perception of real costs. This adjusts the idea of progress and development to encompass the well-being of the entire Life community.

Sustainability. The ecological life systems within a region are part of the wider self-sustaining planetary system. It is crucial that our human systems begin to reflect and support this sustainability principle. We need to develop ways to evaluate our human activities (agriculture, forestry, health care, transportation, banking, water use, energy use, etc.) in that light. We, in fact, need to learn how to "reinhabit" the home-region in which we live, to accurately understand its ecological carrying capacity, and to design towards regional sufficiency.

Interdependence. Acknowledgment of interdependence encourages the biocentric design of human systems. This recognition also allows for a creative approach to aesthetic and functional aspects as well, such as optimum capacity for resonance and enhancement of surroundings; incorporation of wind, water, sunlight in design; consideration of geographical/spatial placement; and designing with inter-species communion in mind.

Importance of feedback-response circuits. A culture needs to be able to receive information and respond to it through reflection, evaluation, and potential adaptation or change. Presently, it appears that contemporary cultures do not have adequate response circuits built in. For example, cultural dependence on the automobile results in inordinate consumption of human time and fossil fuel. Yet, because of an entrenched transportation industry that is reinforced by government as well as private motives, creative options for cultural reconstitution are not adequately supported—such as designing urban villages where workplace and homeplace are nearer to each other, producing environmentally sustainable vehicles, etc.

Means for transference of information. All cultures have ways for the passing on of information and wisdom from generation to generation. The accumulated experience of a culture can be shared through storytelling, art, academics, child-rearing, educa-

tion, etc. It is important to appreciate and participate in the crafting of this organic form of “storage and retrieval.”

Sacredness of life. The address of the Hau De No Sau Nee Nation at the UN Conference of Non-governmental Organizations in Geneva in 1977 voices this concept most eloquently: “The original instructions direct that we who walk about on the Earth are to express a great respect, an affection, and a gratitude toward all the spirits which create and support life . . . Our roots are deep in the lands where we live . . . The soil is rich from the bones of thousands of our generations. Each of us were created in those lands and it is our duty to take great care of them . . . We walk about with a great respect, for the Earth is a very sacred place.” Each culture can help this sense of the sacredness of life flourish both on the personal as well as cultural level.

Celebration and reflection. Culture is our species’ medium for shared existence as well as shared exuberance. Intentional, cultural celebration as well as cultural modes of reflection enhance our capacity for communion with the rest of the universe—not just on the personal level but on the community-wide level. Conscious recognition and appreciation of human/cultural as well as ecological heritage, both seasonal and historical, is a form of elemental nourishment that can only come in a shared form.

PART FIVE

World Order Education, Business and Governance

This final section considers the topic of cooperation in the context of education, business and governance, three of the most important and influential institutions of the modern world. Educators David and Roger Johnson provide a concrete agenda for cooperative learning, including a well-tested program for how to implement it in the classroom. Terry Mollner, Copresident of the Trusteeship Institute, finds that even in the business community well-designed cooperative organizations such as the Mondragon Cooperatives in the Pyrenees can be more productive and efficient than competitive ones. Finally, philosopher and systems theorist Ervin Laszlo emphasizes the urgent need in today's world for governance structures that reach beyond the level of nation states, especially in the critical areas of mutual security and the environment.

CHAPTER 18

Preparing Children to Live in an Interdependent World

DAVID W. JOHNSON and ROGER T. JOHNSON

PERVASIVENESS OF COOPERATION

The human species seems to have a *cooperation imperative*: We desire and seek out opportunities to operate jointly with others to achieve mutual goals (Johnson & Johnson, 1989). Humans by their nature cooperate with each other. Just as the cheetah survives by speed, and hawks survive by their eyesight, humans survive by their ability to “work together to get the job done.” From cradle to grave we cooperate with others within family, work, leisure, and community settings. Cooperation is built into our biology and it is the building block of human evolution and progress. From conceiving a child to sending a rocket to the moon, our successes require cooperation among individuals. Throughout history humans have come together to (a) accomplish feats that any one of them could not achieve alone and (b) share their joys and sorrows.

COOPERATION AND WORLD INTERDEPENDENCE

We live in a complex, interconnected world in which cultures collide every minute and dependencies limit the flexibility of individuals and nations. Because of technological, economic, ecological, and political interdependence the solution to most problems cannot be achieved by one individual or country alone. The major problems faced by individuals (e.g., contamination of the environment, warming of the atmosphere, world hunger, international terrorism, nuclear war) are increasingly ones that cannot be solved by actions taken only at the national level. The internationalization of problems have increased so that there are no clear lines between domestic and international problems. The international affairs of one country are the internal affairs of other nations and vice versa. *Cooperation, therefore, must be established among disparate peoples and nations.*

Interdependence worldwide has complex consequences. On the one hand, it has brought blessings far beyond what past dreamers imagined. Heightened world trade has increased incomes—and living standards—and has propelled developing countries into the industrialized 20th century. On the other hand, it has increased each country’s vulnerability to all other countries. Interdependence is not

all roses and light. Countries are far more vulnerable to outside economic disruptions than they were even a few years ago. Inflation can spread across national borders like wildfire. Countries' autonomy over their own economic policies has been circumscribed—drastic actions by one country quickly translate into hardships for another. Thus, while interdependence creates greater worldwide prosperity and productivity, it also increases each country's ability to influence the events within all other countries. The result is cooperation that must be managed in larger and larger units.

World interdependence is now a reality based on technology, economic, ecology, and politics that go beyond national boundaries and tie all countries in the world together. The management of human interdependence on a global, national, regional, organizational, community, family, and interpersonal level is one of the most pressing issues of our time. Understanding the nature of interdependent systems and how to operate effectively within them is an essential quality of current and future citizens. There are few things more important to teach our children, adolescents, and young adults than (a) a basic understanding of how cooperative systems function and (b) the social competencies required to work cooperatively with a wide variety of diverse individuals.

Failure to Teach Interdependent Values

Our failure to teach children and adolescents about meaningful interdependence is signified by the values they have adopted. There has been a significant increase over the past two decades in adolescents' and youth's concern for personal well-being, and a diminished concern for the welfare of others (particularly the less advantaged) and society. Concern with material values and success in their chosen field of work is much higher among today's high school and college students than it was 20 or even 10 years ago. Less than one in six of today's American college-bound high school seniors consider "making a contribution to society" or "working to correct social and economic inequities" a very important value. Today's young people are extending and expanding the values of "self-fulfillment" and "self-expression" but without a corresponding sense of commitment to the welfare of others, society, and the world. They are making one's own material well-being and the fulfillment of one's own needs as the major goals in life. They are doing so out of a *delusion of individualism*, which is the belief that each person is separate and apart from all other individuals and, therefore, the frustration, unhappiness, hunger, despair, and misery of others has no significant bearing on one's own well-being. What is denied is that in an interdependent community, society, and world, we all sink or swim together.

Many individuals have failed to learn how to understand and manage interdependent relationships. They seem not to have *experienced* cooperation or to have observed *models* who demonstrated how to manage interdependence effectively. Cooperative experiences for children, adolescents, and young adults have decreased since they are no longer an important part of the economic unit of the family. At one time, children learned the importance of cooperation and how to do

it when they worked day-after-day alongside of their parents on farms and small family businesses. Very few children today have such experiences. Schools have tended to be part of the problem, not part of the solution. For example, 80 to 90 percent of the today's school experience is listening to lectures, completing individual worksheets, studying alone, and taking individual tests on Friday. This emphasis on competitive and individualistic learning isolates children and adolescents from one another and may increase the alienation they feel from other people, the school, and civic responsibilities.

NEED FOR COOPERATIVE LEARNING

Given the changes in family and community structure, and the political promotion of the delusion of individualism, the schools represent our best hope for teaching children, adolescents, and young adults about the nature of interpersonal, intergroup, and international interdependence and cooperation. Within the schools there are two approaches that may be taken to teaching students the competencies required to build and maintain cooperation among diverse individuals and groups. The first approach is through direct teaching about human interdependence. The second is using an instructional strategy that models cooperation and provides the experiences children, adolescents, and young adults need to gain cooperative competencies. What we do usually far outweighs what we say. *The way in which students are taught and the structure of learning situations may teach far more than the curriculum materials.* Thus, the instructional methods used within schools need to be such that students are prepared to live in an interdependent, diverse, rapidly changing world.

WHAT IS COOPERATIVE LEARNING

"I want to be able to hear a pin drop in this room." "Don't copy." "I want to see what you can do, not your neighbor." "Save the talking for the hallway." These are familiar teacher statements exhorting students to work by themselves without interacting with their classmates. In many classrooms, however, these statements are becoming passe. Throughout North America, Europe, the South Pacific, and many other parts of the world, schools are rediscovering of the power of having students work together, cooperatively, to learn.

"What is cooperative learning?" Cooperation is working together to accomplish shared goals and *cooperative learning* is the instructional use of small groups (i.e., pairs, triads, or fours) so that students work together to maximize their own and each other's learning (Johnson, Johnson, & Holubec, 1990). Within cooperative learning groups students are given two responsibilities: To learn the assigned material and make sure that all other members of their group do likewise. Thus, a student seeks an outcome that is beneficial to him- or herself *and* beneficial to all other group members. In cooperative learning situations, students perceive that they can reach their learning goals only if the other students in the learning group

also do so. Students discuss the material to be learned with each other, help and assist each other to understand it, and encourage each other to work hard. The idea is simple. Class members are split into groups of from two to five members after receiving instruction from the teacher. They then work through the assignment until all group members have successfully understood and completed it. Day after day, they must resolve their personal differences and work together. Students realize they have a stake in each other's success. They become mutually responsible for each other's learning.

Cooperative efforts result in students striving for mutual benefit so that all group members benefit from one's efforts (your success benefits me and my success benefits you), recognizing that all group members share a common fate (We all sink or swim together here), recognizing that one's performance is mutually caused by oneself and one's colleagues (I can not do it without you), and feeling proud and jointly celebrating when a group member is recognized for achievement (You got an A! That is terrific!).

Cooperative learning groups may be used to teach specific content (*formal cooperative learning groups*), to ensure active cognitive processing of information during a lecture (*informal cooperative learning groups*), and to provide long-term support and assistance for academic progress (*cooperative base groups*) in the classroom (Johnson, Johnson, & Holubec, 1990). Any assignment in any curriculum for any age student can be done cooperatively. In *formal cooperative learning groups* the teacher structures the learning groups (deciding on group size and how to assign students to groups); teaches the academic concepts, principles, and strategies that the students are to master and apply; assigns a task to be completed cooperatively; and then monitors the functioning of the learning groups and intervenes to (a) teach collaborative skills and (b) provide assistance in academic learning when it is needed. When direct teaching procedures (such as a lecture or a movie) are being used, *informal cooperative learning groups* can be used to focus student attention on the material to be learned, set a mood conducive to learning, help organize in advance the material to be covered in a class session, ensure that students cognitively process the material being taught, and provide closure to an instructional session. Students can summarize in five minute discussions what they know about a topic before and after a lecture. Short five minute discussions in cooperative pairs can be interspersed throughout a lecture. In this way the main problem of lectures can be countered: "The information passes from the notes of the professor to the notes of the student without passing through the mind of either one." Finally, *cooperative base groups* can be used to provide each student the support, encouragement, and assistance they need to make academic progress. These groups meet daily (or at least twice a week). They are permanent (lasting from one to several years) and provide the long-term caring peer relationships necessary to influence members consistently to work hard in school. The use of base groups tends to improve attendance, personalize the work required and the school experience, and improve the quality and quantity of learning. When used in combination, cooperative formal, informal, and base groups provide an overall structure to classroom life.

Cooperative learning may be contrasted with competitive and individualistic learning. In the *competitive* classroom, students work against each other to achieve a goal that only one or a few students can attain. Students are graded on a curve,

which requires them to work faster and more accurately than their peers. Thus, students seek an outcome that is personally beneficial but detrimental to all other students in the class. In the *individualistic* classroom students work by themselves to accomplish learning goals unrelated to those of the other students. Individual goals are assigned, students' efforts are evaluated on a fixed set of standards, and students are rewarded accordingly. Thus, the student seeks an outcome that is personally beneficial and ignores as irrelevant the goal achievement of other students.

BASIC ELEMENTS OF COOPERATIVE LEARNING

Many teachers believe that they are implementing cooperative learning when in fact they are missing its essence. Putting students into groups to learn is not the same thing as structuring cooperation among students. Cooperation is *not*:

1. Having students sit side by side at the same table and talk with each other as they do their individual assignments.
2. Having students do a task individually with instructions that the ones who finish first are to help the slower students.
3. Assigning a report to a group where one student does all the work and others put their name on it.

Cooperation is much more than being physically near other students, discussing material with other students, helping other students, or sharing materials with other students, although each of these is important in cooperative learning.

In order for a lesson to be cooperative, five basic elements are essential and need to be included (Johnson, Johnson, & Holubec, 1990). In a math class, for example, a teacher assigns her students a set of math story problems to solve. Students are placed in groups of three. The *instructional task* is for the students to solve each story problem correctly and understand the correct strategy for doing so. The teacher must now implement the five basic elements. The first element of a cooperative lesson to be included is *positive interdependence*. Students must believe that they are linked with others in a way that one cannot succeed unless the other members of the group succeed (and vice versa). In other words, students must perceive that they "sink or swim together." Within the math story problems lesson, positive interdependence is structured by group members (1) agreeing on the answer and the strategies for solving each problem (goal interdependence) and (2) fulfilling assigned role responsibilities (role interdependence). Each group is given a set of story problems (one copy for each student) and a set of three "role" cards. Each group member is assigned one of the roles. The *reader* reads the problems aloud to the group. The *checker* makes sure that all members can explain how to solve each problem correctly. The *encourager* in a friendly way encourages all members of the group to participate in the discussion, sharing their ideas and feelings. Other ways of structuring positive interdependence includes having common rewards, being dependent on each other's resources, or a division of labor.

The second element of a cooperative lesson is *face-to-face promotive interaction* among students. This exists when students orally explain to each other how to solve problems, discuss with each other the nature of the concepts and strategies being

learned, teach one's knowledge to classmates, and explain to each other the connections between present and past learning. This face-to-face interaction is *promotive* in the sense that students help, assist, encourage, and support each other's efforts to learn. In the math lesson, the teacher must provide the time and encouragement for students to exchange ideas and help each other learn.

The third element is *individual accountability*. The teacher needs to ensure that the performance of each individual student is assessed and the results given back to the group and the individual. It is important that the group knows who needs more assistance in completing the assignment and it is important that group members know they cannot "hitch-hike" on the work of others. Common ways to structure individual accountability include giving an individual test to each student and randomly selecting one student's work to represent the entire group. In the math lesson, since group members certify that all members (1) have the correct answer written on their answer sheets and (2) can correctly explain how to solve each problem, individual accountability is structured by having the teacher pick one answer sheet at random to score for the group and randomly asking one group member to explain how to solve one of the problems.

The fourth element is *social skills*. Groups cannot function effectively if students do not have and use the needed leadership, decision-making, trust-building, communication, and conflict-management skills. These skills have to be taught just as purposefully and precisely as academic skills. Many students have never worked cooperatively in learning situations and, therefore, lack the needed social skills for doing so. Today, the math teacher is emphasizing the skill of "making sure everyone understands." When the teacher sees students engaging in the skill, she verbally praises the group and puts a star on the group's paper. Procedures and strategies for teaching students social skills may be found in Johnson (1990, 1991), Johnson and F. Johnson (1991), and Johnson, Johnson, and Holubec (1990).

Finally, the teacher must ensure that *groups process* how well they are achieving their goals and maintaining effective working relationships among members. At the end of the math period the groups process their functioning by answering two questions: (1) What is something each member did that was helpful for the group and (2) What is something each member could do to make the group even better tomorrow? Such processing enables learning groups to focus on group maintenance, facilitates the learning of collaborative skills, ensures that members receive feedback on their participation, and reminds students to practice collaborative skills consistently. Some of the keys to successful processing are allowing sufficient time for it to take place, making it specific rather than vague, maintaining student involvement in processing, reminding students to use their collaborative skills while they process, and ensuring that clear expectations of the purpose of processing have been communicated.

WHAT DO WE KNOW ABOUT COOPERATIVE LEARNING?

The crisis in leadership seen throughout the world occurs as well within most organizations. Millions of technical, professional and managerial jobs today require

much more than technical competence. They also require leading cooperative efforts. The jobs require individuals to get things done in a complex social milieu that requires influencing a large and diverse group of people (bosses, subordinates, peers, customers, and others), despite lacking much formal control over them and despite a general disinclination to cooperate. Getting a group of people that you do not have power over to move in some needed direction is rarely easy. When they are diverse in background, perspectives, and priorities it is even harder. Yet this is exactly the skill that many jobs demand, even of relatively low-level employees in project management and other roles such as executive secretary. There is a scarcity of people who can handle these jobs effectively. Especially among our young adults. When you put a person who has been a competitive/individualistic learner for 12 to 16 years into a job that demands leadership, what usually happens is quite predictable. The person focuses on the technical aspects of the job and does poorly in getting team members to work together cooperatively.

Working together to get the job done can have profound effects. The amount of research demonstrating the effectiveness of cooperative efforts is staggering. The first research study was conducted in 1897 and during the past 90 years over 550 studies have been conducted by a wide variety of researchers in a wide variety of settings (Johnson & Johnson, 1989). With the amount of research evidence available, it is surprising that classroom practice is so oriented toward individualistic and competitive learning. It is time for the discrepancy to be reduced between what research indicates is effective in teaching and what teachers actually do.

From the 550 studies that have been conducted, a number of conclusions may be made (Johnson & Johnson, 1989).

Working together to achieve a common goal produces higher achievement and greater productivity than does working alone. This is so well confirmed by so much research that it stands as one of the strongest principles of social and organizational psychology. Teachers using cooperative learning are on very safe grounds empirically. The more conceptual the task, the more problem solving required, the more desirable higher-level reasoning and critical thinking, the more creativity required, and the greater the application required of what is being learned to the real world, the greater the superiority of cooperative over competitive and individualistic learning. What this means is that individuals who have been educated within cooperative learning groups are more likely as adults to invent new products, discover cures for cancers, create new theoretical insights, and work productively.

Students care more about each other and are more committed to each other's success and well-being when they work together to get the job done than when they compete to see who is best or work independently from each other. This is true when students are homogeneous and it is also true when students differ in intellectual ability, handicapping conditions, ethnic membership, social class, and gender. When students are heterogeneous, cooperating on a task results in more realistic and positive views of each other. As relationships become more positive, there are corresponding increases in morale, productivity, feelings of personal commitment and responsibility to do the assigned work, willingness to take on and persist in completing difficult tasks, and commitment to peer's success and growth. Within cooperative classrooms, every student typically has friends.

Working cooperatively with peers, and valuing cooperating, results in higher self-esteem and greater psychological health than does competing with classmates or working independently. Personal ego-strength, self-confidence, independence, and autonomy are all promoted by being involved in cooperative efforts with caring people, who are committed to each other's success and well-being, and who respect each other as separate and unique individuals. When students work together to complete assignments, they interact (mastering social skills and competencies), they promote each other's success (gaining self-worth), they form personal as well as professional relationships (creating the basis for healthy social development). There is little wonder that students' psychological adjustment and health increases when schools are dominated by cooperative learning. When children, adolescents, and young adults leave school, furthermore, they need enough psychological stability to build and maintain career, family, and community relationships, to establish a basic and meaningful interdependence with other people, and to participate effectively within their society and world. The more they have worked cooperatively with others, the more they see themselves as worthwhile and as having value, the greater their productivity, the greater their acceptance and support of others, and the more autonomous and independent they tend to be. It takes a lot of cooperative relationships to become a strong, independent, and autonomous individual. Cooperative experiences are not a luxury. They are an absolute necessity for the healthy development of individuals who can function independently.

Cooperative learning is one of the few instructional practices that is guided by a well-formulated and empirically validated theory (see Johnson & Johnson, 1989). To some there is no difference between driving a Ford and a Rolls Royce. They both have engines and they both run. But one is better engineered and constructed than the other. The extensive and careful theorizing on cooperation make it a Rolls Royce of education.

Cooperative learning simultaneously models interdependence and provides students with the experiences they need to understand the nature of cooperation. The future of the world depends on the constructive and competent management of interdependence. Students who have had 12 to 20 years of cooperative learning will be better able to do so than will students who have had 12 to 20 years of competitive and individualistic learning.

COOPERATION AND CONFLICT

When nations and organizations work together to solve mutual and/or global problems, conflict results. Nations disagree about the nature and cause of the problems, have differing values and goals related to outcomes and means, and disagree in how much each should contribute to the problem-solving efforts. *How constructively such conflicts are resolved becomes the central issue of how well interdependence is managed.* Children, adolescents, and young adults can be trained in how to manage conflicts within cooperative groups constructively. The more committed students are to achieving the group's goals and the more students are committed to each other, the more frequently conflicts occur within the group. Conflicts are

moments of truth that determine whether group productivity increases or decreases. Students, therefore, need to be trained in how to make creative and high quality team decisions, how to negotiate constructive resolutions of conflicts, and how to mediate conflicts among other team members (Johnson & Johnson, 1987).

WHO IS IMPLEMENTING COOPERATION?

Since the early 1970's we have been working with a network of school districts, colleges, and vocational training institutes throughout the United States, Canada, Scandinavia, and a number of other countries interested in long-term efforts to implement cooperative learning and collegial support groups. Implementation within a district takes from three to five years and involved five 6-day training modules: Basic cooperative learning, advanced cooperative learning, constructive conflict management, leadership training (for the "super-stars" within the district who are then given responsibility for conducting the basic training), and administrator training (how to recognize good from poor implementations of cooperative learning, how to model cooperative procedures during faculty meetings, how to support and encourage the use of cooperative learning, and how to organize, structure, and supervise teacher collegial support groups.) Once teachers are using cooperative learning in the classroom and principals are using collegial support groups within the buildings, the final step is organizing administrators into district-wide collegial support groups. There is then a congruent organizational structure from top to bottom.

FACING UP

Times have changed. As two farm boys from Indiana, we have witnessed it. Family and community life no longer revolve around training children, adolescents, and young adults to be effective cooperators. As interdependence has increased on an interpersonal, intergroup, and international level, our children and youth have become more isolated and neglected. We no longer model interdependence within the home, school, community, or society and we no longer give children, adolescents, and young adults the experiences they need to understand cooperative efforts and gain competencies in working with others to get the job done. Instead, we have promoted the *delusion of individualism*, letting our youth believe that they can be concerned with their own well-being while ignoring as irrelevant the well-being of others. The possibility that the welfare of individuals in a different country in another hemisphere will directly influence one's success seems beyond the conception of our current young adults. Myopic egocentrism is the order of the day.

The societal changes that have resulted in the delusion of individualism have to be faced. Children, adolescents, and young adults have to be taught about interdependence. Social settings within which interdependent efforts may be modeled and structured a significant amount of the day are required. *Schools seem to be the ideal place.* Most children, adolescents, and young adults interact more with their classmates

and teachers than they do with their family members. Cooperative learning provides both a model and a source of experiences for students.

Cooperative learning is the instructional use of small groups so that students work together to maximize their own and each other's learning. Cooperative learning experiences are based on students' perceiving that they sink or swim together and that they must provide face-to-face help and support, do their fair share of the work, provide leadership and resolve conflicts constructively, and periodically process how to improve the effectiveness of the group. Not only will students achieve higher and learn more complex cognitive skills, working cooperatively will also increase their ability to work effectively with diverse and heterogeneous peers, their self-esteem and psychological health, their ability to act independently and exert their autonomy, their interpersonal and small-group skills, and their understanding of interdependence and cooperative efforts.

Of all the issues facing the world, the increasing interdependence among individuals, communities, and countries may be the most important. The future of the world and our species depends on how well we manage it. Today's children and adolescents of all ethnic groups and heritages, rich and poor alike, *are* the potential captains of that future. We owe them the best experiences in how to build, lead, and maintain cooperative efforts that we can give.

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CHAPTER 19

Business, the Relationship Age, and a New Kind of Nation

TERRY MOLLNER

Throughout the ages the truly sophisticated business person has known that the marketplace is fundamentally cooperative, not competitive. The free and orderly exchange of goods assumes the absence of a free-for-all. The conscious or unconscious agreement to not have a free-for-all is the cooperative context within which the free market exists. Unless you are at war with someone unto death, you are operating within some degree of restraints which are cooperative agreements. Free markets, therefore, necessitate a social contract which allows agreements to be made, products produced, distribution effected, etc. all on a continuous basis. Competition may be where the focus is, but it is cooperation which is fundamental in the marketplace.

It is also cooperation which determines success or failure when times are bad. If you go into business and fail, you fail. When Chrysler failed, it was saved. During the savings and loan crisis, when a small savings and loan bank failed, it failed. When a big bank failed, it was saved. In other words, the cooperative agreement is that big companies and banks will not be allowed to fail but little ones will be allowed to fail. Obviously, the people in the big organizations, including the government, are cooperating with one another at the expense of the people in the little organizations.

Thus, you will not witness a savvy business person making enemies. You will find him or her making friends everywhere he or she goes. That is because friends make cooperative agreements; enemies do so only reluctantly. After all, a "sale" is a cooperative agreement and friends, by definition, cooperate for their mutual benefit while enemies sabotage each other's self-interest. We also read of small banks or businesses which have friends in high places which are saved from failure. Obviously, friends in high places can be more valuable for this purpose than other friends.

In fact, as we will see below, competition is not even an alternative to cooperation. It is the lowest form of cooperation. There is no alternative to cooperation. It is fundamental.

The view of the universe as an immense number of separate parts which compete for the fulfillment of their self-interests is giving way to the view that it is one body with an immense number of connected parts which primarily cooperate in the self-interest of the one whole. The latter is no longer viewed by the new

science as an illusory ideal but as fact. Evolution, it turns out, is not fundamentally competitive. It is fundamentally cooperative.

As you have certainly realized by now, what is being presented here is a worldview which may not be familiar to you. However, it is this new worldview which will be defining our future. The global symbols of the Material Age—the Berlin Wall, the Iron Curtain, and the Super-power rivalry—are gone. They have been replaced by a peaceful united Germany, in a united Europe, in a rejuvenated United Nations committed to collective global security and free markets. These are the global symbols of the new Relationship Age. Earth has been in the Material Age since before human civilization. It is now entering the Relationship Age, the period when personal and planetary activities will be based on the assumption that *all is relationship, not matter*. The behaviors of the Relationship Age naturally begin to emerge from each of us when we embrace a new (at least to twentieth century science), more mature definition of who we are.

THE RELATIONSHIP AGE

Under the Material Age worldview of both capitalist and socialist societies, I define my “self” as “my body.” My body is “material—a part of the universe.” Our new understanding of nature as a result of our study of sub-atomic particle physics, relativity theory, and quantum theory suggests a new definition of “self.” According to this Relationship Age worldview, as I call it, my “self” is “all that is—the universe.” The universe is no longer viewed as an immense number of separate parts competing for their own self-interest. Rather, it is an immense number of connected parts cooperating in the self-interest of the one, indivisible whole. All is relationship, not matter. (The smallest particle, it turns out, is not a particle at all. It is a pattern of organic energy.) Therefore, “I” am not only my body. “I” am the universe. So is everyone and everything else. There is only one thing, world, or being and we’re it. Let me explain how this can be true.

The New Science

In quantum mechanics scientists postulate that time and space do not have objective realities outside human perception. They are, in effect, mutually agreed upon illusions that we all accept and share. They are valuable illusions because they allow us to create language and be self-aware, but they are not real. Perception itself is an extension of and only possible because of this mutually agreed upon illusion. (Nothing we see is real; it only has the meaning we have given it.) Thus, the surface perceptions which first come to our minds as a result of the creation of language, that of separate and competing parts, is not accurate. It is a projection of the mutually agreed upon illusions which allow us to create language and be self-conscious. When we learn to suspend these illusions, we begin to see the universe not as a finite number of unrelated parts functioning independently but as an

infinite number of closely related parts functioning inter-dependently. Each connected and interdependent part primarily cooperates with all others for the common good, that is, for the self-interest of the one indivisible whole.

I find it of no small interest that the above assumption has also been the basis of spiritual and moral behavior throughout the ages. Now, in a reversal of previous positions taken by the scientific community of the Material Age, many scientists—but still a minority—are telling us that, based on the principle that there is only one whole, moral behavior is a natural phenomenon existing throughout the universe. Therefore, it is no longer necessary to assume that it needs to be imposed.

As we explore this further, it becomes apparent that a healthy whole is not possible without the health of all the parts. From biology we know that the impulse toward health and balance exists within each cell, within each organ, within each system, within the total organism itself, and finally is extended outward into the impulse to find harmony and balance with the external environment. If this observation of nature is an indicator, we can safely say that the interdependence of the parts with the whole is not a learned process but a relationship that exists throughout the universe.

Taking these theories as a model for human organization, we see that adjustment to the Relationship Age depends not on forcing ourselves to either learn new ways of being or unlearn old habits. Rather, when we switch from the Material Age self-definition to the Relationship Age self-definition we transcend the illusion of perception and reconnect with an existing and very fundamental and natural impulse. The result is, indeed, new ways of being but they are automatic, spontaneous, natural, and enjoyable. As we become aware of the patterns of behavior which emerge, our actions become more self-conscious and masterful at this new level of maturity. We find that we are on a course of learning which is thoroughly enjoyable and captivating. We remain focused on getting better and better at it without any feeling of effort or forcing ourselves. Its fun. Its life.

The existence of free will, which we too often associate with rugged individualism and the satisfaction of the body as our highest priority, should not be construed to mean that we are separate and independent. It is possible that there are more than five billion limbs of the one universal body each of which has the function of free will. Just as the impulse of each cell in our bodies to maintain its own optimal health ultimately benefits our whole body, so what we perceive as the drive of each of the more than five billion human beings on our planet to exercise their self-conscious ability called “free will” ultimately benefits the whole. It mainly does so by ultimately choosing the Relationship Age self-definition as the fundamental assumption upon which it builds relationships between and among human beings and the rest of nature.

There Is Only One Natural Law

Under the Material Age worldview, operationally we have each discovered that there are two opposing natural laws. By nature all the parts of my body know

themselves as parts of one thing called “my body.” Therefore, my hand always gives priority to the good of the whole body over its own self-interests. It never, except perhaps in times of serious illness, uses or abuses other parts of my body. However, according to this worldview, it is also natural for my body to always give priority to itself relative to all other things. Thus, among the parts of my body, nature’s rule is cooperation. Between my body and the rest of nature, nature’s rule is competition. In other words, operating on the Material Age worldview we have each discovered that reality is a contradiction.

According to the Relationship Age worldview, reality is no longer a contradiction. Cooperation, not competition, is the fundamental relationship among all the perceived parts of the universe. Competition is not even an alternative option. It is the lowest form of cooperation. The relationship of cooperation has no alternative. It is fundamental.

A farmer or anyone who has had two dogs or cats has probably witnessed the fundamental cooperativeness of nature. If you put down one bowl of food for two dogs, they will fight over it. This is the lowest level at which the parts of the universe cooperate for the good of the one whole, by the survival of the fittest through competition. However, if you consistently put down a bowl for each, they will cooperate by each eating out of their own bowl. Given the opportunity to cooperate at a higher level of maturity, direct cooperation with one another for the good of the one whole, they will naturally do so.

As we will see, once this oneness definition becomes a self-conscious choice as it can in human beings, the planet can evolve into having self-conscious cooperation rather than competition be the dominant form of fundamental cooperation. This would be a higher stage of evolution for the planet. Having this occur as an extension of individual free choice rather than allowing this natural instinct toward maturation on the basis of the assumption of oneness be manipulated by fascist has been the main theme in the story of human civilization since its emergence.

The Priorities in the Relationship Age Are the Opposite from Those in the Material Age

Practically speaking, for individuals, couples, groups, corporations, and nations this means a reversal of the Material Age priorities. Instead of giving highest priority to the self-interests of ourselves, those who own the company, etc. the common good becomes the highest priority at all times. All relative good, i.e., the good of this part of the universe relative to another part, is always secondary and attended to only as an extension of the common good. These priorities are chosen either out of greater wisdom or out of the experience of discovering through the path of hard knocks that this is the only way to fully satisfy one’s individual self-interests.

This is not done out of idealism. It is done because if it is true that the universe is one, indivisible whole, then this ranking of priorities is natural and, more importantly, we have been giving priority to the common good all along regardless of our efforts to do otherwise. We have just been doing it at a lower level of maturity than is

possible. Because of our adherence to the Material Age worldview, we have been freely choosing to do it at the level of maturity of minerals, vegetables, and animals rather than at the level of maturity which is possible for self-conscious beings, or a self-conscious universe.

Since it is obvious what the damage to all would be if we didn't, under the Material Age worldview it is usually agreed that we should give priority to the common good while at the same time it is agreed that it is not natural to do so. Thus, capitalism gives priority to the freedom of the individual to pursue his or her self-interests with only a minimum of restrictions while communism gives priority to the responsibility of the individual to the group and uses force to make sure it occurs. Neither assumes that it is natural for the individual to give priority at all times to the common good.

The essence of the emerging Relationship Age is that we will no longer rely on the common good being the result of force or the indirect result of competition to fulfill our independent self-interests. Rather we will each choose to give the common good highest priority at all times because we know that it is our true self-interest by nature. In fact, we can't stop doing it but only do it at higher or lower levels of maturity because the universe is, indeed, one indivisible whole and were it.

The Emotional Feeling of Full Rather than Partial Satisfaction Becomes Possible

Also, doing it by choice is the only way to have the emotional feeling of full rather than partial satisfaction moment to moment as we move through life. This can occur because the tension from assuming reality to be a contradiction will no longer be present. Our choice of behaviors will be able to consistently be extensions of our one worldview without continually tacking between self-sacrifice and greed in search of the ephemeral mean. We will know what to do and choose it directly. This, as will be explained later, will allow for the feeling of full rather than partial satisfaction each moment regardless of how things happen in time and space. We will care what is happening in time and space, but it will not affect our fundamental feeling of peace which results from knowledgeably choosing the Relationship Age worldview and learning to live consistently inside it. The relative feelings which result from occurrences in time and space will be experienced as information, not something to be taken personally, which allows us to more artfully act for the common good. This, in turn, will result in cooperation for the common good being our self-conscious priority in the marketplace and competition being secondary—solely a means of establishing prices and stimulating creativity—and not something which threatens the health and survival of people.

The Full Metamorphoses into the Relationship Age Could Happen Rapidly

If this is our new starting point, the business community in capitalist nations may soon undergo a change as radical as that which has occurred in recent years in

communist nations. Only rather than returning to democracy and free-market economies as the communist nations are doing, we will be moving forward to the next way, the Relationship Age. This radical change will be hastened by the fact that the rivalry with communism is no longer a distraction. This will focus a harsher light on capitalism with a demand that its shortcomings finally be eliminated. Since they will never be able to be eliminated while living within the Material Age, the Relationship Age will continue to emerge.

This metamorphoses into the Relationship Age could happen rapidly because just like the people under communism, people in capitalist nations are also overly ready for the next stage in the evolutionary journey.

THERE ARE ONLY TWO POSSIBLE FUNDAMENTAL SELF-DEFINITIONS

Before discussing the changes in the marketplace which are occurring, lets first give greater definition to the Material Age and Relationship Age self-definitions or worldviews.

It can be argued that there are only two possible fundamental worldviews. If we write the numbers from "0" on up on a line, each could represent a way the universe could be structured:

✕ 1/2 3 4 5 6 7 8 9 etc.

"0" is the symbol for "does not exist—illusion." We are not interested in what is not. We are interested in what is. So we will cross out this option.

"1" stands for the assumption that the universe is one, indivisible whole. "2" stands for the assumption that the universe is two separate parts or forces where each acts in its own self-interest. "3" stands for the assumption that the universe is three separate parts or forces where each acts in its own self-interest, etc.

The one thing options "2," "3," "4," etc. all have in common is that they are not oneness. Also, competition rather than cooperation is fundamental. Thus, there are only two possible fundamental worldviews: oneness and two-or-moreness. All other worldviews, theories, philosophies, theologies, social theories, etc. must assume one of these two possible fundamental worldviews.

Each, using the terms Material Age Worldview and Relationship Age Worldview, would be defined as follows:

Material Age worldwide: (two-or-moreness)	the assumption that the universe is somewhere between two and an immense number of <i>separtate parts</i> each of which <i>competes</i> for its own self-interest in relation to all other things. (Evolution is the result of the survival of the fittest through competition.)
Relationship Age worldview: (oneness)	the assumption that the universe is an immense number of <i>connected parts</i> each of which <i>cooperates</i> with all other parts in the interest of the universe first and only secondary cooperates or competes in the interest of itself or any sub-group of parts. (Evolution is the result of the cooperation of all things for the maturation of the one whole.)

Evolution assumes change which assumes time and space. Reality, oneness, is changeless—there is no particular time or space to go from or toward where one is

not already. However, in the time and space world of self-conscious perception the self-interest of the one whole appears to be the maturation of the one whole. This is the projection of the assumption of time and space which allows for perception. The self-interest of the one whole is really the maturation of perception to an understanding of the changelessness of oneness while at the same time perceiving it as the maturation of the whole in the illusion of time and space. Thus the Big Bang Theory and all other theories of when time and space began are false. Time and space had no beginning. They are not real.

In one's personal experience, the result of understanding this wisdom is the witnessing and participation in the maturation process of evolution within the context of a changeless peace and tranquility without any experience of contradiction. This is so because that which is real is being given priority and that which is illusion is secondary and viewed only as the language of self-conscious oneness.

How two people or nations relate, therefore, is a direct result of the level of maturity of their perceptions, not of events. This is why a wise person, such as Mohandas Gandhi, would fast and meditate before an important meeting in the process of the liberation of India from England. He wanted to be sure he came to the meeting with the correct perceptions. He knew that maturity, or love, is irresistible. If he could see the other person consistently as a part of himself regardless of the demands and seductions which may occur, the other person would eventually let go of them, look at Gandhi, and say, "What are *we* going to do with *our* problem?" From this perspective all things in time and space can be arranged to mutual satisfaction.

The Relationship Age worldview does not say that the Material Age definition of evolution is wrong. It simply says that there is a more fundamental definition within which the Material Age definition of evolution exists as a limited view. It is a view from half way up the mountain rather than from the top. The relationship between the two different self-definitions which result form these two possible fundamental worldviews is easily seen when we look at the Cooperative Maturation Continuum.

THE COOPERATIVE MATURATION CONTINUUM

The Cooperative Maturation Continuum represents the range of human behaviors in terms of these two possible fundamental self-definitions or worldviews. (*vide infra*)

First, before describing the above model, why are these theories important in the practical, everyday world? One way to answer this is by looking at a typical business.

If we look at it from the perspective of the Relationship Age, we see that a company is not merely the capital, buildings, products, machines, computers, fleets of trucks, etc., through which its activities are carried out. Those are merely tools used by the people within the company to carry out their various tasks. Beyond this, the company would be seen as the relationships between and among the people working in the organization. IBM, for example, is not its computers and buildings. Rather, it is the agreements, which are derived from perceptions, by which people are joined together—the contracts, written or implied, that define relationships, that constitute the heart and the life blood of the entity we call "IBM." The same can

The Cooperative Maturation Continuum

War	Competition	Enlightened Self-Interest	Self-Conscious Cooperation	Self-Conscious Harmony
competition unto death—lowest skill of self-consciously cooperating as one with all things	belief in separate parts with differing degrees of restraints	compromise—belief in separate parts as real but attempting cooperation	belief in no separate parts, with differing degrees of competition allowed	cooperation which is total, self-conscious, and effortless—highest skill of self-consciously cooperating as one with all things
Material Age				
(.....Competitive Continuum)				
(assume two-or-moreness to be real)				
("self" is defined as less than the universe)				
Relationship Age				
(.....Cooperative Continuum)				
(assume oneness to be real)				
("self" is defined as the universe)				
Lowest Level of Human Maturity				Highest Level of Human Maturity

MATERIAL AGE THE JOURNEY)				

be said for any group, large or small, from a married couple to a nation. And it is our self-definition of who we are which is always our starting point for creating these agreements.

If within an organization we define ourselves assuming a Material Age perspective, as being separate bodies, we will play by one set of rules: put somewhat simplistically, "me against the world." If we think of ourselves as more than our bodies, that is, as a member of a family, a community, a team, a religion, a corporation, etc., the basic rules don't really change much. The only difference is that our associations with others expand our resources, change our ability to compete, widen our influence in the world, etc. So, "me against the world," becomes "us against the world." Reality still has at least two parts.

When we step into Relationship Age thinking, however, we begin viewing ourselves as truly integral parts of one vast whole. We start thinking of our lives as joined, no longer separated from others. Our self-identities are now connected to and interdependent with everything in the universe. When a ship's captain makes an error and runs his vessel aground, spilling millions of gallons of crude oil along a pristine shoreline, we perceive and feel our relationship with that event. We suffer the horror of our ruined landscape and the dying wildlife. We recognize that as consumers we are part of that long continuum that invented the technology which depends so much on petroleum. We do have an intimate relationship to the whole event and that, perhaps, is what causes us to feel our outrage and grief so deeply. These feelings are especially strong when we learn of the atrocities in a war.

If the Relationship Age worldview is correct and all things are, indeed, parts of a whole, then war and competition are not alternatives to cooperation; rather, they

are the lower forms of cooperation. If the universe is one thing, it is not possible to escape the interrelatedness of nature with all its interdependent parts moving and relating as parts of the whole. The survival of the fittest through competition is simply the most cooperative relationship as parts of the one whole possible for non-self-conscious parts.

Moving from left to right on the Cooperative Maturation Continuum is moving from less mature forms of cooperation to more mature forms, from war at one extreme to self-conscious harmony at the other extreme. By choosing the Material Age worldview, we have locked ourselves into the experiences at the lowest level of maturity. Compromise, where neither side in a relationship feels fully satisfied, is the most mature experience available to us. This is the behavior we would call “loving” whether at home, at work, or anywhere else.

However, once the Relationship Age worldview is chosen, the experiences on the second half of the continuum become viewed as possibilities rather than as naive fantasies. Our view of what is possible in an organization, partnership, friendship, or loving relationship changes and, of course, we now demand more than a willingness to compromise in our most intimate or important relationships. We now want the self-conscious feeling of togetherness as parts of one thing which has no opposite. This is the feeling of true love which we are forever seeking because we have had it for fleeting moments while operating on the Material Age self-definition—particularly in moments with one other human being where the feeling of oneness was present because our focus of attention was temporarily solely on that particular relationship. In part, this probably explains the large increase in divorce in our society and is additional evidence that we are moving into the Relationship Age. It also explains the demand for more mature relationships at work and the decline of the competitive ethic encouraged up till recently by management and unions. People have come to believe that it is possible to agree, disagree, sort things out, and make decisions as a secondary activity within a continuous loving context rather than at the expense of it.

Note that in the Material Age worldview each person has a different top priority from everyone else: the top priority of each person at all times is his or her own self-interest. Whereas with the Relationship Age worldview all people and things have the same top priority at all times—the good of the one whole. It is this which allows for continuous peace rather than conflict within relationships. And it is this which allows all to feel their self-interests are fully and continuously satisfied, rather than partially and periodically satisfied. And this is the one and only top priority which will allow an individual or group to have this experience.

However, the common good will only be our top priority at all times if we agree that the Relationship Age self-definition is the accurate one. Otherwise it would be something which we are forcing upon ourselves and not actually agree is true. That is why the fact that at least some sciences are now concluding that the Relationship Age self-definition is the correct choice is so important. This means that it is natural to have the common good as our top priority. It also means that it always is our top priority even when we have chosen the Material Age self-definition. We can't escape nature.

Therefore, it is important to see this continuum as a maturation continuum. We

must have the ability to choose an identity before we can choose to change that identity. We must learn language and become aware of our ability to choose before we can choose. This is why many cultures have had rites of passage into adulthood for young people usually between the ages of 7 and 14. Somewhere in here children become self-conscious of self-consciousness, cease simply adjusting and reacting, and begin defining themselves first and then choosing behaviors which are consistent with this self-definition.

After hearing people in one of my graduate school classes continually assume that one must get rid of one's ego, a street-wise community organizer from Poland finally shouted, "Get rid of ego? You need ego strength! You have to have a strong ego to survive in this world and get anything accomplished!" This is true. To change one's self-definition necessitates first having a self-definition which allows one to feel legitimate in choosing to freely and unilaterally change one's self-definition. This same pattern has been discovered in biology: integration requires prior differentiation. Without the skill of language, being self-conscious of self-consciousness, and feeling free and able to choose to change one's self-definition, the maturation into the oneness worldview of the Relationship Age cannot occur.

So the behaviors exhibited by people operating on the Material Age self-definition are not "bad." They are the result of ignorance. They are the result of operating at a lower level of maturity, a level of maturity at which we all once operated. Our priority in relating with them should not be to judge and punish them but to assist them to mature. If we are at a higher level of maturity, we are elders and we have the joyful and fulfilling responsibility of elders. Elders do not lead by force but by example, by inviting others to participate, and by responding to requests for assistance.

It is necessary to know the difference between the two possible fundamental worldviews not only in thought but also in feelings, patterns of thinking, and in the experience of behaviors to be able to make a clear choice. This is why many who have chosen oneness ideologically are unable to exemplify it in action and are viewed as "airy" or "spacey." However, despite many suggestions to the contrary, it is not difficult for one who truly knows the oneness way of life to assist another to learn it.

Although Material Age thinking has been dominate on our planet since perhaps the beginning of human history, we are now at the beginning of our journey not only as individuals and organizations but also as a planet into the Relationship Age. In the Relationship Age, how we relate to each other becomes the primary focus of our attention. While the Material Age goals of focusing our attention on the distribution of goods and services will continue to be important it will not be accomplished at the expense of our relationships. This will be a major evolutionary shift on our planet, comparable to the invention of language or the discovery of fire.

As our world continues to shrink into a planetary village, it also becomes increasingly necessary to focus on our inter-dependence and to evolve into the future using the Relationship Age as our worldview. This is a natural part of the evolutionary process.

With the technologies of today we can know what is happening in any part of the globe within seconds. Almost at the exact instant that the Berlin Wall comes down, and the people standing near it cheer, the event is celebrated in homes all over the

U.S. A tremendous uplifting of the human spirit is felt not just in Berlin but virtually in every spot on the Earth. The sigh, the tears of joy, are experienced globally, and the experience reminds us of our oneness. Through television we are all increasingly experiencing the globe as our village.

However, this experience of the globe as our village has not only been in the realm of sharing common joys but also in the realm of sharing common fears. For example, with our development of nuclear weapons we have come to see that war is never waged against an anonymous enemy but is waged against the whole of which we are a part. With nuclear weapons and our capacity to wage a war from which there can emerge no winners we are at last beginning to see that our real enemy is not “the other guy”; it is our own inability to relate peacefully with our adversaries. The result has been a shedding of the super-power rivalry and a mutual embrace of collective security. In the future we hope to increasingly resolve conflicts through diplomacy and negotiations before a war rather than after it. This is the most obvious evidence of the ascendance of the Relationship Age on the global level. The increase in the concern for the environment is another obvious example of the beginnings of this journey at the global level. The solutions to these problems can only be the result of global agreements which give priority to the common good.

The new level of maturity we achieve with the Relationship Age is changing everything. In changing our definition of self we change the way we think and feel; we change our understanding of our relationship with God or the one, indivisible whole; we change our experience of romantic love, our social, political, and economic contracts, and even the corporate agreements necessary for remaining “competitive”—that is, “valued” or, dare we say, “loving and lovable”—in a free-market economy. (Isn’t Tom Peters really screaming that we should be more “loving and lovable” in all his lectures and books?)

Since the beginning of human civilization, in every tribe, village, and nation the supporters of each of the two possible fundamental worldviews have each been seeking a consensus. Since they were opposites, it was obvious that one had to be a false worldview and the other true—the universe can’t be one thing and two-or-more things at the same time. Equally obvious, the consensus would only be able to hold once the correct one was chosen. Finally, it could only be chosen once there was an explanation of its accuracy which made sense and was verifiable in experience, both in the laboratory and everyday life.

Our latest scientific discoveries have finally taken us to this point in the laboratory. The power of science as our new spokesperson for God is evident in the fact that the spiritual life has been taking people to this point in everyday life for thousands of years. Yet, until science discovered this truth in the laboratory, it insisted on looking the other way. This should not be scorned. This adds to its credibility as a discipline committed to the discovery of truth through direct experience and should finally firmly establish the oneness worldview and self-definition as the correct choice. Thus, now that science is also beginning—it is still not the majority view—to embrace the Relationship Age worldview, one can confidently conclude that the populations of the world will increasingly do so as well.

Of course, consensus on the oneness worldview has been reached by many tribes and nations in the past. However what makes this movement toward a consensus on

it unique is that this time it is being reached by the planetary village and with the approval of the current main planetary spokesperson for God—science. There is no unknown tribe which may be discovered on the other side of the mountain which is still following the Material Age worldview. This would encourage a return to fear and attack as a way of life, and a degeneration into an embrace of the Material Age worldview which inevitably accompanies such behavior. Assuming there are no human cultures on other planets, at least any with which we will have contact anytime soon, our only threat is from within our own planetary village. Therefore, we will have a memory of our discussions and conclusions.

Now that we have enough scientific knowledge to conclude that the Relationship Age worldview is the correct fundamental worldview, we will never be able to act as if we do not know that it is so. That is the wonderful thing about truth—once you know it you can never act as if you don't know it. And now it is becoming the choice of the one big village of which we are all members—Earth.

RELATIONSHIP ECONOMICS

Within the Relationship Age self-definition, we can identify three possible relative power relationships and economies:

The Three Possible Power Relationships and Economies

Fundamental Assumption	Power Relationship	Economic Agreement	Economic Example
Material Age	Power Hierarchy	Command Economy	Soviet Union
Two-or-moreness	Competition	Market Economy	United States
Relationship Age	One Partnership	Relationship Economy	Mondragon
or Oneness			

Under the assumptions of the Material Age there are only two possible power relationships: 1) either one person (or group) is in charge of others (power hierarchy) or, 2) there is no agreement about who is in charge, resulting in open-ended competition for power (competition).

Under the assumptions of the Relationship Age there is only one possible power relationship: “one partnership.” This is when each person freely chooses, or finds himself or herself choosing, to heed and follow the natural impulse within to make the common good his or her primary concern at all times.

In the “relationship economy” of the Relationship Age, the individual is first and foremost a total team player—without an opposing team. One might compete with another person, another group, another company, but the primary goal would always be the good of all.

It is important to note that even in the relationship economics of the Relationship Age people may organize according to a hierarchical system, becoming dutiful soldiers, giving and taking orders to accomplish a task. They might employ motivational techniques such as promising rewards if the task is accomplished in a certain

way, a technique also associated with the Material Age. All three fundamental power relationships—competition, power hierarchy, and one partnership—can be present in a relationship economy, as long as the priority at all times is the common good—one partnership. It is not the presence or absence of Material Age or Relationship Age relationships which is important. More often than not they are usually all present to some degree. It is how they are prioritized and the continuation of those priorities at all times and in all things which makes the difference.

An embrace of the Material Age worldview results in either a command economy or a market economy. Until recently, the Soviet Union was the most well known example of the command economy and the United States was one of the well known examples of the market economy. The best example I have found of the relationship economy is the Mondragon Cooperatives in the Basque region of northern Spain. A look at it may tell us something about the future which may be about to blossom in our market economies in the wake of communism's implosion and the embrace of the Relationship Age worldview by people in the business community.

Mondragon

The inspiration behind Mondragon was a Catholic priest who in his own way understood the difference between the Material Age and Relationship Age worldviews. From the beginning he was about the business of creating a society based on the latter.

His first assignment upon leaving the seminary in 1941 was to be an assistant pastor at the Catholic church in the small town of Mondragon which is high in the Pyrenees Mountains of northern Spain. Mondragon is in the Basque region and Father Don Jose Maria Arizmendiarrietta was Basque. This was just after the Spanish Civil War which General Francisco Franco and his fascist party had won.

He had had a difficult time defeating the Basques who had sided with the freely elected democratic socialist government against the fascists. If the democratic socialists won, the Basques had been promised an amicable separation from Spain so they could create their own nation. As a result, after the war Franco treated the Basques like an occupied nation. He even outlawed the Basque language. This forged a deep solidarity among the Basques. This was on top of the deep solidarity which already exists within Basque society.

The rainfall in the Pyrenees is such that there has never been a drought. Thus the Basques have never had to migrate. They have lived in those mountains for as long as there has been recorded history. Also, their farming and village life has been based on consensual democratic policies for as long as they can remember. At the same time, they have always been dominated by other people. These conditions, plus a unique language and common religion, have forged a deep solidarity among the Basque people.

So Father Arizmendi, not only a devout Catholic but also a devout Basque, set about building a Relationship Age society by extending into more sophisticated realms the Relationship Age values which were already present in Basque society. Since Mondragon was a small town very far off of the beaten paths, the people in

Mondragon not only had the solidarity of history but also the immediate experience of being prisoners in a prison camp. In this setting, as is usually true of oppressed and imprisoned people, it was natural for Mondragonians to give priority to their identity as Basques—the common good of the group—over their self-interests. A very fertile soil within which to begin.

The Philosophy of Father Arizmendi

To this mix Don Jose Maria added a pinch of wisdom. Mondragon is based on the non-material (call it “agreements” or “mind” or “spirit” or “relationship”). The common good is given priority over a particular good. Or, said another way, people (what is possible for self-conscious beings) come before things.

What is right relationship among people? We all know from our personal experience that the one word answer to this question is “love.” But how does love play itself out in the structuring of a business enterprise?

From my research on philosopher Arizmendi, I have concluded that he observed that lovers behave differently around “things” than enemies do. If we are lovers and we have an apple which we both want, we probably will split the apple as evenly as possible and share it. If one of us has not eaten all day and the other just has had a full meal, the latter will take a little piece and give the rest to the former.

Lovers behave as if they have only one mind and one body. With little effort they share resources as easily together as they make decisions alone.

Enemies, on the other hand, behave in the opposite manner. If we are enemies and we have an apple, one of us might try to gobble it down while the other is not noticing. Or, if too smart for that, we might agree to share it by cutting it in half. Then we would both try to take the bigger piece even if one of us has had a full meal recently.

Enemies behave as if they have two different minds and bodies. This is because they think “things” are most important. There being only so many things around at any one time, they try to acquire as many of them as they can. Life for them is a process of competing and taking.

The difference between friends and enemies lies in the fact that the relationship among friends can be timeless and spaceless. For instance, if we make a mistake with a loved one, apologize and are forgiven, it can be as if it never happened. Yet materially it did happen. Relationship can be timeless and spaceless; matter is in time and space. If the relationship is truly loving, there can be no conflict around matter.

Arizmendi simply extended this relationship of oneness known by all in friendships and between lovers into the relationship with all things, even with those who see themselves as our enemies—like Franco and his Guardia Civil soldiers which were nearly always in view. Arizmendi pointed out that they were powerless to decide what people were thinking in their minds. Thus, rather than confront them, which would be acting as if they could, Arizmendi separated what people were doing from the language and belief system within which they were doing it. “Lets do what we want to do and then simply talk about it in their language and ideas,” is

the kind of thing Don Jose Maria might have said. "Since in their worldview they do not think what we are doing is possible, they will think we are doing what they want us to be doing because we are talking their language. We will be left alone to do exactly what we want to do right under their noses. They will be happy and we will be happy without there being any need for confrontation. Soon they will discover that we are growing and they are not because they are stuck standing there watching us." Of course, they also wanted the occupation to end and they would work for that as well, but in the meantime they would be happy and prosperous and be building a society of their own. Thus, as you can see, Father Arizmendi's non-violent or loving methods of dealing with an oppressor in this setting did not even necessitate confrontation.

The History of Mondragon

In 1943 Father Arizmendi assisted the students in his youth group to start a cooperative technical high school using funds donated by the community. There were parents, students, teachers, administrators, and community members on its Board of Trustees. He became head of the school. He taught his students and many in the community through his evening adult study group classes and conversations in bars his Relationship Age philosophy as the way up and out of their predicament. He was not charismatic—people fell asleep during his sermons—but he was sure of his views, consistent, and persistent. The question for which he is most remembered is, "How can we do this in a way which works fully for those in the enterprise and those in the community rather than for one more than the other?" He never let them believe that it was necessary for someone to win and someone to lose. Giving priority to the common good always allowed all to win.

By 1954 five of his original eleven youth group boys who had gone to college had worked their way up to management levels at the large industrial company in town, the Union Carrejera. However, they became frustrated in their efforts to apply Father Arizmendi's ideas. So they left and formed a new company (Ulgor) where they could implement his teachings. They raised funds from local townspeople, just as they had when they had started the technical school. In 1956 they opened a small paraffin stove factory with 24 people. When butane gas arrived in Spain, they converted to butane stoves and caught the industrial wave entering Spain. Within one year, they had 117 owner-workers and had bought two nearby foundries.

Today, the "Mondragon Cooperatives" is an association of over 160 cooperative enterprises, more than 100 of which are owner-worker industrial cooperatives. (Of course, Relationship Age companies do not need to be democratically owned and controlled by the members; but as is the case with all relationships which allow for maturation, there is a tendency to eventually become democratic and then consensually democratic.) Beautiful, clean, and modern factories stretch out along the valley for several miles and are scattered throughout the Basque region of northern Spain. There are more than 22,000 members whose jobs are virtually guaranteed for life.

More than half of the Mondragon companies are focused on industry, producing

the full range of consumer and industrial goods, ranging from plastic rulers to bicycles and robots. Collectively, they are Spain's top producers of industrial machinery and major home appliances—refrigerators, stoves, washers and dryers, machine tools, etc. In addition, the Mondragon enterprises lead the way in heavy construction, furniture production, farming and high technology. Spain's only producer of computer chips is a Mondragon firm.

Coop members have a broad health insurance plan for their families, a private unemployment program which pays 80 percent of take-home pay if you are ever laid off, and a pension program, separate from their accumulation of profits, paying 60 percent of their salary on the last day of work until death. Upon retirement, most members are also offered a plot for a vegetable garden if they don't happen to have one where they live.

The 160 independent "relationship cooperatives," as I call them to distinguish them from Material Age cooperatives, are members of an association that owns and controls its own bank, the Caja Laboral Popular (The Bank of the People's Labor). As might be expected, all the businesses do their banking with their own bank.

Relationship Entrepreneurship

I was amazed when I learned that the bank's Entrepreneurial Division, which provides venture capital for developing new relationship cooperatives, has close to a 100 percent success rate! In other words, nearly every relationship cooperative it has capitalized has succeeded. By contrast, venture capitalists in the United States consider a 20 percent success rate respectable, with 80 percent of all new businesses failing within the first five years.

The secret of Mondragon's success is that they have a unique approach to business development which virtually guarantees success every time. It not only assumes every new business will succeed, it makes a commitment to the business until it does and it backs this pledge with a highly-skilled staff at the Association's Entrepreneurial Division.

They only begin with a group of people who are already friends, never with one individual. They view these natural bonds of friendship as the bedrock upon which the new firm is built. Then the Bank and the founding group agree to stay together until the business is profitable. The members of the founder group put up twice the membership fee others will invest and the Bank loans the business the rest of the capital at approximately 13%. If the business has difficulty, the Bank loans any additional capital at 8%. If more trouble, 0%. If still more trouble, the Bank will donate capital to the business. In other words, the riskier the loan the lower the interest rate! Eventually, even if they have to switch managers or even their product line, the business becomes successful and is able to repay much of the loans, although the Bank often uses a portion of its profits to reduce the size of the loans of all of its relationship cooperative businesses.

You may think this is a very unusual relationship that has been created. However, it is not as foreign as you might think. The Bank is simply relating with these new businesses in the same way any large company relates with any new division it has

created to produce a new product. The only difference is that the Bank itself is a division of the one conglomerate called the Mondragon Cooperatives and this is its particular task. The circle defining our “we” has simply been extended by all beyond the corporation to include not only the Bank but the entire community.

Only unlike conventional businesses of the Material Age which rank their priorities capital-product-managers-workers, Mondragon ranks its priorities in exactly the opposite order: workers-managers-product-capital. People are given the highest priority and “things” the lowest.

Because capital is mainly stored labor and since the entire community is behind the creation of any business, nothing—not even capital—is ever abandoned. As long as the community is willing to put labor into the formation of a business, there will be capital available. This way the Bank never has defaulted loans, interest rates can be lower for riskier loans because the Bank will never abandon the business (so it's better to not overburden it), the owner-workers get guaranteed jobs for life, the community gets a stable commercial sector, and the consumers get high quality, inexpensive products. Everyone wins.

In Mondragon, the venture capital to finance new businesses comes from the savings accounts of bank depositors! This is virtually never done elsewhere. Does this scare depositors? Apparently not. The Caja Laboral Popular is one of the fastest growing and most successful banks in the world, with a branch in nearly every Basque neighborhood and more than 600,000 depositors. It has \$3 billion in total assets. To assure that the businesses remain strong, the seasoned business experts at the Entrepreneurial Division monitor the performance of every relationship cooperative on a monthly basis and are quick to recommend action if any difficulties emerge.

Mondragon's Commercial and Community Businesses

The Mondragon association has not limited its activities to business and banking. Its total approach includes the needs of the members, their families and the surrounding community. They have participated in nearly every realm of community development. They have built over forty cooperative housing complexes, many incorporating grocery stores and other retail shops. They have created the equivalent of private day care, grade school, high school, and higher education facilities. The Mondragon educational system includes over forty schools and a college. In addition, there is a student relationship cooperative which allows working students to fully cover their tuition and living expenses for their private high school and college while offering the experience of running their own relationship cooperative. Looking at all these benefits, it is no wonder that people brought up in the system usually stay. To support this, children of members go to the head of the line of those seeking positions in the relationship economy.

The association of Mondragon Cooperatives includes a health maintenance organization, a health insurance company, their own social security system, and a chain of nearly 300 cooperative food stores—some of which include consumer retail complexes similar to K-Mart or Walmart—with over \$400 million in annual sales.

The profitability of the Mondragon cooperatives is twice that of the average corporations in Spain. Of even greater significance, worker productivity in the cooperatives is higher than in any other organizations in Spain. While much of their success in this area is the result of Mondragon's innovative management approach, it can also be attributed to their aggressive use of high-technology production methods, such as robotics. And casting all conclusions about the management performance of Material Age cooperatives aside, in a study by the Anglo-German Foundation for the Study of Industrial Society, the management was found to be some of the most aggressive and innovative ever seen by the Foundation's staff. Also, the members were found to be highly motivated and personally fulfilled by their jobs.

The commercial enterprises of the Mondragon Cooperatives sold over \$1.6 billion worth of goods and services in 1987. 19 percent of this for export. And during the deep European business recession of the late 1970s and early 1980s, when 20 percent of the employees in the surrounding economy lost their jobs, the relationship cooperatives increased employment by 36 percent!

In light of the Mondragon Cooperatives' extraordinary success record it should come as no surprise that the Association became the Basque's model for the future. What is surprising is that the cooperatives were built in spite of suffering through over forty years of repression under General Francisco Franco—a testament to the wisdom of Father Arizmendi. The Spanish dictator died in 1975 but the Basques were not granted local autonomy until 1982. Then, in the 1989 meeting of the Basque National Congress, Mondragon's "third way" was adopted as the official economic policy of the new Basque nation. This may be the first nation in modern times to commit itself to the development of relationship economics.

The Structure of a Mondragon Enterprise

Having articulated his philosophy, Father Arizmendi asked his young students and the men and women in the bars and drinking clubs "If these ideas are true, what kind of an organization does it suggest?"

First, they realized that if they wanted to have a loving organization, they could not define seemingly opposite roles, for example workers and owners, as the responsibility of different people, as if these roles could be separated in time and space. Are not we all both full co-owners and co-workers of the planet at all times before we are anything else?

To have easy and freely chosen one-mindedness, it is best if the owner and the worker in a business are the same person. If I am the person who decides what movie to go to and you are the person who goes to the movie, that will seem ludicrous to us. In this example, we easily can see that to separate the choosing and the doing from one another in time and space (into different bodies) brings fear into the relationship. We will each fear that the other will not be sensitive enough to our needs and wants. The potential for conflict is great.

If I am the chooser and the doer, however, I have no fear at all. I know I will be sensitive to my needs and wants so the relationship between the chooser and doer,

being both in me, is peaceful. This inner peace is the result of my freedom; the capitalist in me is happy.

If you and I are going to a movie together and we both are the chooser and the doer, then our relationship can be timeless and spaceless. If we are lovers and you want to go to movie A and I want to go to movie B, we will talk about it. If you want to go to movie A more than I want to go to movie B, we will decide to go to movie A. We will both be happy—yet in the material world I did not get anything I initially wanted while you got everything you first wanted. We are happy because we freely acted as if we had one mind. The limitations of the material world are fully accepted; we could only go to one movie together. There is peace in the relationship. This peace is the result of solidarity; the socialist in us is happy.

Then Father Arizmendi rose above and beyond the Material Age of capitalism and socialism by identifying this as not only the loving relationship between the roles of owner and worker but also between the enterprise and everyone outside the enterprise. The individual freedom of others is honored and the good of all is given priority. Thus, this democratic enterprise is also unlike most other democratic workplaces which explains why it is so successful and most Material Age cooperatives have more often than not struggled or failed. In a “relationship cooperative” all share the same top priority—the common good. In a Material Age cooperative, each has a different highest priority—each individual’s self-interest. Conflict, not cooperation, is still the basis of the philosophy. Thus, as at Mondragon, the Relationship Age worldview will eventually allow a plethora of democratic workplaces to emerge and flourish within a free market economy.

So, the first rule of a relationship cooperative is that the chooser and the doer, the owner and the worker—must be the same person. This merge of roles must go beyond titles and become the actual inner and outer (operational) experience of each member.

Each worker not only invests in the business by working all day but also, for the business to succeed, the worker must also become equally invested as an owner. Mondragon believes there is only one thing that will assure this investment as an owner and that is risking capital (stored labor). Everyone knows that ownership is. It is being at risk of something which is yours gets damaged or lost. People can be fully invested in something without being financially at risk. However, Mondragon wants everyone in the community to be equally invested to be members. So they need to make sure everyone becomes invested 100 percent as an owner. To ensure this, every member is required to loan the cooperative a substantial sum (without collateral) which is the equivalent of the lowest annual salary (about \$10,000 in U.S. dollars).

New members do not have to possess this capital on day one. They simply sign a note and it will be withheld from their salary over time with no interest attached. Membership, thereby, is open to all, regardless of financial circumstances. If the business goes bankrupt the next day, however, the owner-workers will still need to pay off the loan to the bankruptcy courts. In other words, even though the capital was not loaned on day one, the owner-worker is fully at risk and invested as an owner from the beginning.

The rest of the structure of a Mondragon cooperative is equally insightful into human nature. Only members of the cooperative can be on its Board of Trustees.

This assures adult-adult psychology patterns. Many owner-worker cooperatives in the past have invited non-members to be on their boards, resulting in parent-child (chooser-doer) psychological patterns.

Each board has two main committees: the Management Council and the Social Council. The manager is an owner-worker who is hired as manager for a four-year term. During that time the manager cannot be told what to do; he or she can only be demoted. This unique aspect of the Mondragon design is based on the recognition that management is a specialty skill. So Mondragon hires skilled managers and then gets out of their way and lets them do their jobs. This has solved perhaps one of the greatest problems of all other owner-worker cooperative experiments.

In past efforts, managers were suspect because the workers had come from capitalist enterprises where the hierarchy was used as a power tool. As a result managers often did not have specialized training and, even if they did, the other owner-workers used their influence to demand changes in management's business plan without sensitivity to the sophistication of its design. Because of these tendencies toward ineffective management, it has been widely believed that democratic ownership could never compete in a capitalist society.

Mondragon has solved this problem by identifying the essence of hierarchy. They discovered that its essence is efficiency and not power. A hierarchical division of labor is the most efficient way for a group of people to do a complex task; and if the relationships among the people are of the timeless and spaceless variety described earlier, then hierarchy is only an efficiency system.

Thus, Article 4 of the Social Statutes of Ulgor (the first cooperative), as written by Father Arizmendi, reads: "Work is the means adopted for attaining a higher level of satisfaction for human aspirations and demonstrating collaboration with the other members of the community to promote the common good. To ensure that it is contributed freely, productively, and in a manner that makes everyone's collaboration viable, the members shall respect its discipline, namely a hierarchy . . ."

At the same time, the Social Council provides the equivalent of a union within the cooperative structure and also serves as a forum to provide members the opportunity for full participation in management.

Every division of 20 to 50 owner-workers in each business conducts at least a monthly work-group meeting to discuss any issues which have arisen. Each division has a representative who will meet with all the other representatives in the Social Council. The Board of Trustees delegate to the Social Council all the issues with which unions are normally concerned: job descriptions, salary scales, fringe benefits, safety, etc. The Social Council is also responsible for donating 10 percent of any annual company profits to charity. (This compares very favorably with the average American corporate contribution to charity of less than 2%.)

Management and the Social Council representative are part of the group, of course, but also a member of the group who has been elected to the Board of Trustees may participate. Through this system, every owner-worker can be involved in managing every aspect of the enterprise. During these meetings, the owner-workers can discuss anything they choose. Whether an owner-worker becomes enthusiastic about management issues or traditional union issues, his or her substantial capital investment keeps the commitment, both as an owner and a worker,

100 percent present in his or her mind. All owner-workers have one share of voting stock. This keeps them all equal in power. Thus, their relationship within themselves and among each other, as well as with the rest of society, is a one-minded cooperation for the common good.

The structure of the cooperative reflects this one-mindedness in time and space. The capitalist system's equivalent of management and union are each present in Mondragon and distinct; however, they both are inside the "us" of the cooperative, and are subservient to the Board which assures their total integration and coordination. If the Board ever fails in this task, the general assembly of all the owner-workers, which wields the ultimate power within the cooperative, can overrule the board.

Each cooperative elects representatives to the Association of Cooperatives. The Association in turn elects the Board of the secondary cooperatives, such as the bank, the research institute, the entrepreneurial division and the insurance and social security institutions. The main focus of the Association of the Cooperatives in Mondragon is the creation of owner-worker jobs to expand the opportunity for people to participate in the relationship economy. There probably is no better service to themselves. Job creation gives the current owner-workers greater job security and allows them to be enthusiastic about automation. They are very aggressive in robot development. They recognize that it both eliminates repetitive and dirty jobs and increases productivity, which is important in an international marketplace.

At the same time, they view owner-worker job creation as the best service to the community at large. Once a person has an owner-worker job in a Mondragon cooperative, best efforts are made to guarantee it for life. Thus the person's family will never be dependent upon public assistance but will continually contribute to the needs and development of society. Therefore, every act of each owner-worker every day is experienced as providing for one's self and serving society, both simultaneously and both 100 percent. The for-profit versus non-profit personality split with which we are so familiar in our society is absent in the attitude of the Mondragon member. And when you walk through a factory, you feel like you are visiting with someone in their kitchen or working at a church fund raising event and yet their productivity is the highest in Spain.

Finally, the uniqueness of Mondragon is demonstrated in the way profits are distributed by a cooperative. Fifty percent are distributed among the owner-workers based on salary scale and the number of years with the cooperative. However, these profits are not given out in cash. They are allocated to the owner-worker's internal capital account and regarded as a loan from the member to the company. Each year, just before Christmas, the member receives, in cash, the 6 percent interest paid annually on his or her internal account. Thus, the owner-worker's investment in the cooperative increases and the cooperative reinvests the worker's profit to create more relationship economy jobs. The business receives capital without collateral at a low interest rate, normally the most difficult and expensive capital to borrow.

As mentioned earlier, ten percent of the annual profits are donated to charity and the remaining 40 percent is retained in the collective internal account. If the

cooperative ever ceases to exist, this collective account will be donated to charity because it is regarded as the portion of profits which is collectively owned and managed for the common good. So, even the profits escape the time and space material axis by seeming to go in two directions at the same time. The owner-worker has the use of his or her portion of the 50 percent because it can be used as collateral at the bank for a loan which will be at an interest rate only a point or two over the 6 percent it is earning. Yet the cooperative has the use of the capital at the same time.

Don Jose Maria prepared the first by-laws and social statutes which extended the Relationship Age worldview into every aspect of the agreements upon which the business was based, making sure to leave no opening for an easy unraveling into a Material Age operation. This is evident in the five guiding principles upon which the company operated for more than a year before he could break it down into specifics in the by-laws and social statutes:

1. Solidarity
2. Individual economic contribution
3. Labor contribution by all members
4. Democratic government
5. Progressive expansion to incorporate other workers

“Solidarity” was their word for “the common good.” It was given highest priority. The original by-laws and social statutes created by Don Jose Maria have been used by every subsequent cooperative.

All that is different is the way the founders looked at the situation in the first place. They started from a different place. Everything else was a result of that. The people at Mondragon believe they are all in business together—the owner-workers, consumers, Bank depositors, and community. They arrange it so each owner-worker business is ultimately successful, the owner-workers will have jobs they can control for life, the businesses will avoid wasteful crisis management, the Bank depositors will feel secure about their savings, and the community will not have to worry about disruptive plant closings or absentee owners. Finally, they have the joy of knowing that they all share the same top priority in all they do: the common good. This allows for the feeling of a safe, known, and loving context for the sorting out of all relative differences.

The main statement Mondragon has made is that businesses which operate on the Relationship Age worldview are not only viable in a free market economy but they are potentially more viable. And they certainly fulfill human beings financially, socially, and spiritually in ways which conventional Material Age enterprises are almost incapable of doing. This can only be positive for the success of the business. At a minimum, all other things being equal, this suggests that increasingly Relationship Age businesses will squeeze Material Age businesses out of the marketplace.

THE MARKETPLACE IS NOT FUNDAMENTALLY COMPETITIVE

There is one other key factor which will bring this about: the idea that the marketplace in a free-market economy is fundamentally competitive is a myth

which is no longer believed even by the man on the street. The marketplace, like everything else in nature, is fundamentally cooperative.

Our modern nation states are societies based on agreements, usually called "laws." All relationships occur within these agreements or one is not allowed to play by being put in jail. In fact, as mentioned earlier, capitalism is dependent upon a society of laws and relative social peace to accumulate capital, make investments, build and maintain facilities and distribution networks, and have agreements and contracts fulfilled day in and day out. The keeping of agreements is a cooperative act. In commerce, the primary agreement is that exchanges of goods and services will be determined by a free market.

The fundamental policy in any market sector is also cooperative. The airlines, for instance, give priority to working together first to maintain their market shares and only secondly to compete with one another to increase market share. This is evident from reading the front page of any financial newspaper. Often it is reported that, for instance, one airline was going to raise its fares but did not do so because it could not get the other major airlines to go along. Such action is illegal; yet the natural instinct to cooperate not only has a hard time but is virtually incapable of following rules which thwart cooperation. On another occasion, the airlines will all lower their fares on certain routes to force a new upstart airline out of business.

The argument will be made that companies are both cooperative and competitive. This is true. However, the important question is which is given priority. First, cooperation is fundamental in nature. Thus, it is not possible to not be fundamentally cooperating. Competition is simply the lowest form of cooperation, not an alternative to it. Secondly, when competition is the choice of relative relationship, cooperation is still given priority—cooperation with government, the bank, the community, the trade association, the members, the customers, etc.—to be able to compete. Finally, as mentioned above, there is cooperation with competitors, usually through indirect means rather than by direct contact, to maintain reasonable profits, keep others out of the market by not letting them in or buying them out, and taking more than reasonable profits whenever it can be safely arranged—especially when there are only a few major players and little possibility for new competition to enter the market quickly. Competing to increase market share is last on the list! It is done, and the focus of attention is usually on it; but it is the lowest priority in a mature market with established participants which is the case in the developed nations of the West and many others.

In these countries, it is only the people at the bottom, the individuals and small business people, who suffer the slings and arrows of the lowest forms of cooperation—outrageous competition. The higher up one moves the more one is insulated from such untidy activity. Chrysler was just one of many companies which was too big for the government to allow it to go bankrupt. The government loaned it money until it could get back on its legs. The government, as mentioned earlier, will save big banks from failure but not little banks because failure of the former would be catastrophic for the biggest company of which it is a division—the nation.

In other words, it is only the still naive who believe that the marketplace is primarily competitive. It is primarily cooperative. This myth that competition is fundamental is perpetuated by those who are cooperating as a means of controlling

those who are not powerful since, according to the Material Age worldview, only some people can be powerful. The sad reality is that the powerful believe the myth themselves even though they are quite aware that it is mainly through cooperation with certain others that they are able to maintain and improve their positions. The result is that sophistication is viewed as the ability to live comfortably with this dichotomy, with the assumption that reality is a contradiction. This is a most unpleasant way to go through life, but it is the most enjoyable way possible under the Material Age worldview.

Companies Are Converting to Cooperative Thinking

As it has been becoming more and more self-evident that cooperation is what is fundamental, companies and organizations have been converting to cooperative thinking everywhere. It is the new way to get “a competitive edge” in the marketplace. (Until the switch to the Relationship Age worldview becomes fully self-conscious, we will continue to use Material Age language.) After all, if the Information Era is allowing everyone to rapidly have the same technological skills, other than creativity, it is the productivity of the employees that will make the difference in the marketplace. So the big question has become, “How do we increase the productivity of our people?”

Although unions are often a necessity for justice to the employees when the company is operating on the Material Age worldview, being constantly at odds in one's workplace is an ugly daily experience for both the employees and management. Thus, even the decline in union membership is an indicator that employees no longer want to work in such an atmosphere. The new focus of many unions on cooperative relationships with management is another indicator. Both employees and managers have turned toward the creation of companies which have a cooperative approach. This is evidenced by the large percentage of employees whose incomes are now tied to the performance of their companies. Corporate managers are also discovering that it is idiotic to ask their employees to be ruthless and deceitful in the marketplace and not that way with each other and management in the company. You have to go one way or the other in all directions at all times or you have unpredictability and chaos. And there is no in between. You either choose the fear and conflict approach or the peace and cooperation approach.

Since most managements are still operating on the Material Age self-definition, they discover that all their efforts to bring peace into the equation ultimately fail which brings them back to the policies of fear and individual self-interest. This will continue to be the case until they embrace the Relationship Age self-definition and learn to operate on it with sufficient skill to lead their people into it. We are getting very close to being able to do this as a result of abandoning the politics of conflict within companies. Plus our efforts to learn to act for the common good of all in the company has led us to see that this is inseparable from the common good of all. Slowly but surely we are creeping toward the Relationship Age in the marketplace. A watershed event which will make this switch a self-conscious choice may occur anytime now.

Democracy Is only One Possible Structure for a Relationship Corporation

The ultimate result is not necessarily ownership and control by the employees as occurred at Mondragon. One will always be able to start one's own business or even create a conventional multinational corporation on the Material Age worldview or on the Relationship Age worldview and remain the sole owner. The structural form is not primarily what determines a Relationship Age enterprise. It is the experience of the participants on a moment to moment basis. If participants accurately perceive that the organization is giving priority to the good of all, it is a Relationship Age company.

Working in a cooperative could be hell if people are not skilled at doing it. And working for a wise owner could be bliss. The difference is the wisdom of the leadership. In the second case it was wise and in the first it was not. Of course, it is much easier for one person to be more knowledgeable and everyone to benefit by following him or her. This pattern partially explains why we ended up with capitalist corporations before relationship corporations.

However, whereas form does not determine experience, experience does result in a change in the choice of forms. When the wise person who is currently leading the company dies, his or her replacement may not be as wise and the employees will have no say in who it will be. Thus, as has been the case in politics, experience will ultimately move employees toward democracy in the workplace because it is the only way to control their own destiny in the company. The increase in leveraged buyouts by groups of top management is but the beginning of this phenomenon. The percentage of employees who will become partners should continue to increase as we enter the Relationship Age.

At some point in the future, most entrepreneurs will be selling their businesses to their employees because that is where they will receive the best price because the employees will want to determine their own destiny. Since employee ownership will be commonplace, they will comfortably acquire the resources to buy the firm. Also, the community will consider the entrepreneur a hero for selling it to the employees. Everyone will consider themselves a winner. In other words, the maximization of self-interest, as always, ultimately leads us into the Relationship Age.

However, people are currently so focused on their own separate self-interest, and comfortable switching companies and locations to pursue it, that they do not easily think with such a long time horizon or at such a level of commitment in relationship to their workplaces. This is the case because employees know that since the company is relating with them within the Material Age worldview they easily conclude that it would be unwise to not do the same. Thus, the Material Age model re-enforces itself until the wisdom to go beyond it emerges. Also, the employees know that they do not have the power to change the company in fundamental ways. It is only the owners of the company who have the power to switch the context within which the company operates.

The obvious conclusion is that democratic Relationship Age companies will result from conversions of existing companies and the start-up of new companies. Also obvious, the quicker we learn how to artfully and successfully convert capitalist companies to relationship companies and then to democratic relationship com-

panies the quicker the transformation will occur because most people are already working in capitalist companies.

The Early Stage of the Relationship Age

Many years before this becomes a widespread phenomenon, there will be a period during which companies will continue to be privately owned by a few, or controlled by a few as is usually the case with publicly held companies, but operate on the Relationship Age worldview. There will be an overt commitment to maintain the common good as the highest priority in all things and at all times for two reasons. First, there will be a growing consensus that the Relationship Age self-definition is the correct one which will place social pressure on companies to give priority to the common good and maintain a very clean record in this regard. And, secondly, the marketplace will demand it because it will result in better working conditions, greater employee loyalty, better relationships with the community and others outside the company, and greater productivity.

My judgment is that we are in the earliest part of the first phase of the Relationship Age. I believe this is so because a public discussion of the need to choose between the two possible fundamental self-definitions has not even become widespread. It is still only occurring in pockets here and there far from the public media. The Material Age worldview is still comfortably assumed by all discussants in the media in the USA. At some point, probably as a result of the oneness worldview being presented as part of a new scientific discovery, this discussion will become part of our public decision making process. A consensus on the Relationship Age self-definition and worldview will not take decades to coalesce once the discussion has begun. Rather quickly it will be seen as self-evident because once the question is clearly posed, it is self-evident.

There will be many indications of this change of thinking occurring in the marketplace. Employees will increasingly be seen as "citizens" by management rather than as employees. There will be an even greater sharing of the profits and losses with the employees. More importantly, as the commitment to the common good deepens, the ratio between the highest paid person and the lowest paid person will tend to shrink. This was the policy from the beginning at Mondragon. As an expression of solidarity with the other members inside the enterprise, managers and other highly paid personnel receive significantly less than their counterparts in capitalist organizations. And, to maintain solidarity with workers outside the relationship sector, pay rates for most members are kept close to those received by comparable workers in the non-relationship economy. However, even though it is loaned back to the company until retirement, all receive the added bonus of sharing in half of the profits.

There will be greater concern for the development of the career of the individual employee regardless of where it may lead as long as any transition out of the company is done with sensitivity to the company's needs. There will be greater education of the employees about the total operations of the company and an empowering of employees to assume greater responsibility, operate in teams, and

learn sophisticated consensual decision making skills to speed decision making and increase productivity. There will be greater involvement of private companies in meeting the needs of the communities in which they reside and of other communities in the USA and elsewhere as well.

These things will attract more and more people to prefer employment in relationship corporations. So the relationship economy will grow by success and attraction.

Employee Stock Ownership Plans (ESOPs) are one of the popular ways corporations have increased the cooperative spirit within the company as well as the participation of employees in the increase and decrease in the value of the company. An ESOP is a US government program which uses tax incentives to encourage companies to give and sell stock to their employees. Basically, the government pays for stock the employees receive and profits the owners receive from the sale. When employees own stock in an ESOP, they usually do not have the right to vote the shares for a number of years. That right is placed in a trust which is controlled by management. In this way the company can move a substantial amount of stock into the hands of its employees without giving them any ultimate control over the company. Studies by both the University of Michigan and the Senate Finance Committee have proven that the greater the employee ownership of stock, the greater the productivity. The result has been a yearly increase in the number of ESOPs to where there were over 12,000 by the end of 1990.

There is a clearly discernible pattern toward increased self-conscious cooperation within companies and within the marketplace. As the Relationship Age self-definition becomes the self-conscious choice of more and more individuals as a result of its continued re-enforcement through scientific understanding, relationship corporations will become more numerous.

DEMOCRATIC CORPORATIONS THROUGH ELDERING

Democratic corporations appear to be but a dream at this time. But like the destruction of the Berlin Wall, dreams become reality when the time is right for them to not be dreams anymore. That time is probably not as far out in front of us as we now may think.

Perhaps the most significant barrier to this transition has been the absence of a worldview which made it meaningful and advantageous to convert to workplace democracy. As mentioned earlier, under the Material Age worldview, the top priority of each person is always his or her own self-interest. This results in competitive relationships, the conflict between unions and management being the one with which we are most familiar. Only the Relationship Age worldview allows all to have the same top priority. It also fully rather than partially satisfies the self-interests of the individuals because they define their self-interests differently.

However, there has also been a second barrier—the way we have been going about it. Lacking the Relationship Age worldview, there has been a tendency to view the legal ownership and control of the company by the employees as the highest priority. This has usually resulted in premature conversions, conversions before the genuine feelings of ownership and control were present and the democratic and

management skills necessary were adequately developed. And nearly always it was done before there was a full understanding and embrace of the Relationship Age worldview.

The support of the Relationship Age worldview by many in the science community is making it much easier to present it. This solves the worldview problem.

The second problem is being solved as a result of the realization that there must be a period of time—a transition period—during which both employees and management can learn the wisdom of embracing democratic ownership and control within the Relationship Age worldview rather than the Material Age worldview. Often in the past, democratic ownership and control was legally effected before the skills and abilities to successfully operate on such a system had been achieved. The result was often disastrous. At Trusteeship Institute, we now recommend the following procedure.

First, the owner or owners must embrace the Relationship Age worldview and decide that they would like to lead their employees into an understanding of it, first out of a genuine concern for the good of the employees and, secondly, to convert their company to be a democratically owned and controlled company based upon it. It is then presented to the employees as a management change, something they understand is within their area of responsibility. It is explained that management would be willing to sell the company to the employees should they decide they would like to buy it and management believes they are ready to successfully manage the company. However, although change to relationship management usually ultimately results in a desire by the employees to purchase the company, no pressure will be placed upon them to do so.

Next the employees elect an Employee Board of Trustees (EBT). The Corporate Board of Trustees (CBT) then delegates the responsibility for running the company to the EBT while maintaining the right to veto any of its decisions. It also emphasizes that it will try to never exercise its veto power. Instead it will meet with the EBT to reach a consensual decision. At least one or two people from the CBT sit as ex-official members on the EBT. The rest of the company is also restructured to operate as a Mondragon cooperative under the CBT, i.e., a Social Council, Management Committee, Accounts Committee, etc., are created. Bonuses and pay reductions based on performance are increased and profits are loaned back to the company at interest as are profit distributions at Mondragon, usually using an ESOP. (A portion of any losses are also deducted from these employee internal accounts as they are at Mondragon.)

Now the company is operating as a democratically controlled Relationship Age corporation beginning on the first day. The nature of this structure is to nurture democratic as well as Relationship Age values and processes. The CBT now has a new primary role: elder. It has assumed the responsibility for moving the company into the Relationship Age as a democratic company. It is free to expend the money on consultants and other services to provide the education and assistance as necessary. Often, under the old approach, this is one of the expenses first to be cut by companies once the employees assume ownership.

When, usually a few years later, the employees feel like they own the company as a result of operating it successfully without the need for intervention from the CBT,

the idea of purchasing the company will come from them. Then and only then should the possibility of selling the company to them be seriously explored because at that point the feelings of ownership and control within a Relationship Age context will be real and seasoned.

The CBT should not automatically sell the company to them. They have the responsibility of elders. Their highest priority must be the common good. Only when they believe the employees truly are ready to assume the responsibilities of ownership and control within Relationship Age wisdom should the sale be made. Many may see this as paternalistic, but that would be a projection of the Material Age worldview onto the situation. The fact is that the current CBT is representative of the owners of the company and under the current Material Age rules of our society they can do with it whatever they please. They are the parents. Therefore, this final decision is theirs and can't be taken away from them.

The new challenge facing them is the challenge of eldering, that is, leading the company to greener pastures in a way in which they both appreciate and actually gets them there. To sell the company too soon or too late would be to fail in the eldering responsibility with which society has entrusted them. As you can see, all have important new responsibilities in this process and everyone grows.

Of course, as the current owners grow older or have thoughts of selling the company for whatever reasons, the transfer of ownership issue may arise before the employees put it on the agenda. This often will speed up the process. However, a new owner would not lightly change this system of operation and would have to take it into full consideration before purchasing the company. Either way the probabilities are that the process will continue toward a day when the employees are the final purchasers of the company.

Using this eldering approach, a smooth transition not limited by time is possible. However, this will not be the main reason these conversions will begin to occur in greater numbers. The main reason, of course, will be an understanding of the Relationship Age worldview. The second reason will be that the Relationship Management System will substantially increase productivity, profitability, and peace in the workplace which will make these companies more successful eventually necessitating other companies to make this change to survive.

THE RELATIONSHIP AGE NATION

One of the most remarkable developments at Mondragon is that the association has become what I call a "next nation," "Relationship Age Nation," or simply "Relationship Nation." It is a kind of nation fundamentally different from what we have become used to thinking of when we think of a nation. Unlike nations which define themselves by geography or nationality, this nation defines itself by its agreements.

It is like a corporation or conglomerate in the West in the sense that one could live and work within the structure of an association of relationship enterprises while residing in virtually any nation in the world. However, since the top priority is not private profit but the common good, there would be both for-profit and non-profit

corporations of every kind within the conglomerate, as at Mondragon, to meet nearly all the needs currently met within nations defined by geography. Also, unlike some capitalist conglomerates, a Relationship Age Nation would be viewed by the host nations as an unqualified asset to the local economy and its people. In fact, geographic nations would pass legislation to encourage their emergence. The ramifications of this have far-reaching, and very positive implications socially, economically and politically.

As corporations choose the Relationship Age worldview, it will be natural for them to associate together based on this choice. This association will not be like a trade association, a group which works for the collective self-interest of the members in relationship to other groups such as the government or other industry sectors. Rather, Relationship Age corporate associations will become much like the Mondragon Cooperative Association only in the early stages few of them will be cooperatives. Each company or non-profit organization will maintain its independence yet democratically associate with the others for the common good. The result will be that the association will operate more like a conglomerate with each group being a division of the one large company.

However, because its purpose is the common good, like Mondragon there will be everything from insurance companies, private social security and unemployment insurance programs, medical insurance and services, a bank and entrepreneurial companies, schools and colleges, retail stores, agricultural companies, social clubs, etc., and nearly everything else necessary for a healthy society. The most significant difference between this Relationship Age conglomerate and a nation state will be that the former is defined primarily by agreements rather than by geography. The result would be a new kind of corporate nation which would exist above and with the support of the geographic nations in the same way corporations currently do.

This new kind of nation will emerge because it must be freely chosen by each individual. It cannot be the result of majority or even 75% vote of those in a geographic nation. For each person to be free to join or leave it at anytime, it must be an option within a pluralistic society. Thus, a geographically defined nation cannot easily become a relationship nation. It can only encourage their development. This is why the agreement nation will emerge.

It will most probably be an association of for-profit and non-profit corporations within and transcending geographic nations. In cooperation with geographic nations it will attend to all the needs of its citizens—its members. Its highest operational priority will be the creation of additional jobs until all the people on the planet who choose to are voluntarily living and working in the relationship economic sector.

GOVERNANCE AT MONDRAGON

At Mondragon, a Congress, a Council of Groups, and a Permanent Commission were created as the formal governing structures for the association of enterprises.

The 350 members of the Congress are directly elected by the members of each cooperative, and each cooperative is represented in proportion to its number of

members. The Congress must meet at least once every two years. Since it is mainly a policy body, it is not assumed that it will need to meet very often or for many days when it does.

The purpose of the Congress is to define the philosophy, guidelines, and general criteria that will govern Mondragon. Its jurisdiction embraces practically all aspects of Mondragon's activities. For example, the Congress is responsible for any change in the relationship between capital and labor in the basic model documents, such as the Social Statutes, Internal Rules and Regulations, etc., used by the companies. It also determines the content of the agreements among cooperatives, promotes new cooperatives, provides for the members of social security, and establishes new organizations to solve problems or provide special services to the enterprises. The Congress establishes Mondragon's position on social issues and develops relationships with other social movements. It handles all relationships between the relationship cooperatives and international, national, and state governments.

In short, the association's governance system mirrors that of an individual cooperative with the Congress being the equivalent of the Board of Trustees. The Council of Groups is the equivalent of the manager, and the Permanent Commission is the equivalent of the Accounts Commission. The Accounts Commission is a three member group elected by the members each year which monitors all the activities and finances of the cooperative to be sure all transactions are honest and accurate and which also serves as the ombudsman ready to check out any concern brought to it openly or in private.

The decisions of the Cooperative Congress are not final. It merely makes recommendations to the members. The decisions of the Congress only become final when they are ratified by a majority vote of the membership. This is a significant innovation in political organization. It amounts to direct decision-making by the citizenry rather than by their elected representatives. Essentially, each piece of new legislation is subject to approval or veto, not by a President or some other elected official, but by the citizens themselves. This is a return to direct democracy. We have seen this occurring more and more in America as well, also through the use of referendums.

Most of Mondragon's relationship corporations are associated into conglomerates based on product areas or geography. The Council of Groups is composed of the managers of the 12 conglomerates; the managers of the chain of retail cooperatives, the bank, the entrepreneurial division, the social security system, and the long range research institute; and the President of the Congress. Except for the managers of the bank and entrepreneurial division and the President of the Congress, each group's manager participates voluntarily. Each Council representative has a number of votes equal to the number of members he or she represents; and in order to make a decision, representatives from at least three conglomerates or other groupings must be present. The Council must meet at least once every three months.

The Council of Groups, like an individual company's management, is responsible for overseeing the implementation of the agreements adopted by the Congress and ratified by the members. It is responsible for coordinating discussion and activities at the executive level of Mondragon. It focuses particularly on maintaining a unified industrial policy for all the companies which includes coordinated ap-

proaches to finance, promotion, investment, research and development. The Council will seek to harmonize the interest of Mondragon's various social, human, physical, technical, and financial infrastructures in search of high quality community development. Finally, it solves differences which may arise between the companies and conglomerates. To fulfill all these executive functions, it counts on the collaboration of the Entrepreneurial Division. To prevent the development of a managerial class, the continued existence of the Council of Groups, just like management in an individual company, is dependent upon the Congress which can dissolve it at any time.

While the Council of Groups is responsible for the execution of policies on a day-to-day basis, the Permanent Commission is responsible for representing the interests and policies of the Council on a day-to-day basis to be sure the spirit as well as the letter of the agreements are being kept. The Permanent Commission is composed of the president, vice-president, and secretary of the Congress, and one representative of each of the conglomerates.

There surely are differences and debates within all of these bodies. However, the equivalent of political parties have not emerged nor are they expected to emerge. That is the conflict approach to solving problems, not the consensual approach. Representatives are elected not because they support a particular position but because the groups believe they best represent the entire continuum of positions within the groups fairly. They are elected because it is believed that they are committed to and skillful at searching for the truth. Finally, they are elected because it is believed that they are talented at constructing a consensus which moves the group forward based on its values. The basis for political action is cooperation and consensus because that is seen as the natural process and easily done when assuming the Relationship Age self-definition. Competition and compromise are viewed as immature behaviors, not feared but not chosen either.

Note that "citizenship" in this nation by agreement is reserved for those who have invested their own capital and are continually at greater risk as a result of the reinvestment of their distribution of profits. They are not citizens as a result of where they live but as a result of accepting a portion of the responsibility for the success of this new nation. Rather than being subjects who are taxed, they are voluntary investors who can withdraw their participation and investment at any time. The result is the feeling of being part of a responsible and caring family, a very different feeling from the way most people feel in relationship to their geographic nation, and the reason people are naturally attracted to these new nations.

THE GEOGRAPHIC NATION CAN ONLY ACHIEVE ITS GOALS BY ENCOURAGING THE DEVELOPMENT OF AGREEMENT NATIONS

It is not the fault of the geographic nation that people do not feel part of a responsible and caring family. What we need to understand is that the nature of the geographic nation all but precludes this possibility.

People do not feel part of a family as a result of living in the same geographic area. They feel part of a family by freely making commitments to relationships with

others and accepting collective responsibility for them. This means an investment of time and money. It means the acceptance of responsibility to work, to perform, and to provide not only for one's self but for others. And it means freely choosing to make these decisions.

What the Relationship Age self-definition adds to this is that one is only truly wise when the listing of "the others" does not stop with his or her mate, family, and friends, or even town, state, or nation, but only when we are all included and the person accepts responsibility for his or her relationship with those in all the concentric circles of relationships which extend out from him or her at all times. The agreement nation is the vehicle which allows people who share this view to join together on the basis of it. And it is only they who would be attracted to doing so because those who place their financial self-interest first will quickly realize that a commitment to the Relationship Age self-definition will put them in a different game which would qualify their potential success in their workplace. They would still be able to invest, however; and, as the socially responsible investment community has demonstrated, it is possible to earn market returns on investments while giving priority to the common good.

What we need to do is to encourage the development of Relationship Nations within our geographic nations as the way to achieve the feelings of being part of a family within geographic nations. They will eventually emerge anyway, but wise public policy would be to encourage their development. ESOP legislation is an example of legislative steps in this direction.

The first fear which usually emerges when the idea of many relationship nations sprouting up in communities is discussed is that it will put an end to the melting pot aspect of American culture, particularly if each relationship nation builds its own private schools and the public school system begins to shrink. People will fantasize the emergence of separate Catholic, Jewish, Islam, Black, Hispanic, Christian Fundamentalist, Polish, etc., relationship nations.

First, the very nature of relationship nations is to give priority to the common good by building relationships of friendship with others. These communities exist today. The only difference will be that they will be assuming the Relationship Age self-definition which, in turn, will result in greater and more mature cooperation within the community as well as with those outside it. Secondly, it is probably more likely that people will join in agreement nations based on the Relationship Age worldview and friendship rather than race, nationality, religion, etc. An aspect of embracing the Relationship Age worldview is viewing all these differences as languages of the universe rather than as distinctions which are significant in themselves. Finally, television and the ease with which we are able to move about via automobile and public transportation have turned Earth into one large melting pot.

As long as one is in the Material Age, one will need to create an enemy if there isn't one to be found. Life would not make sense otherwise. For evolution to be the result of the survival of the fittest there must be someone with whom I am suppose to be struggling to survive. When one graduates to the Relationship Age, one finds only friends, some of whom think they are our enemy because they are still operating on the Material Age self-definition. However, those operating on the

Relationship Age self-definition know better. They continue to behave as a friend in relationship to those still in the Material Age, often in the language of competition since that is the language with which people in the Material Age are most comfortable. In other words, the fundamental distinction to one in the Relationship Age is not any differences in time or space (languages, forms, traditions, even beliefs) but in the levels of maturity solely for the purpose of cooperating successfully with the other.

Finally, people will generally continue to buy the best product at the best price regardless of which relationship nation has produced it, their's or another. The purchase of the best products produced by a relationship nation will be seen as giving priority to the Relationship Age over the Material Age. This will be more important than the success of our relationship nation in relationship to another. However, although this will generally be the case, there will certainly be a greater loyalty to one's own relationship nation if all other things are equal and in the start-up and recovery from a downturn phase of a business.

Of course, there will be lapses back into Material Age patterns at times. That is part of the natural spiral of maturation. Mondragon has not been without its problems nor will it be without them in the future. However, ultimately the positive direction of the Relationship Age will always prevail as it always has. After all, all wars begin and end in peace just as all illusions begin and end in reality. The Relationship Age can be summarized as the process of learning to skip illusions and war.

CONCLUSION

If, indeed, the universe is one, indivisible whole and we are all parts of one body, even those of us who have the ability we call "free choice," then evolution is fundamentally cooperative, not competitive. As this new understanding of nature seeps into everyone's patterns of thought, everything in our world will change because feelings and ways of relating which we previously thought to be fanciful will become real possibilities. We will discover that there is a different starting point than we had thought as a result of discovering that our self-definition is different than we had thought.

In the world of matter, there are always trade-offs. We cannot, with our minds, make two apples where there is one. However, one can choose either to make the apple or the relationship more important. If the apple is given top priority, competition will prevail. If the relationship is emphasized, cooperation can develop. The Relationship Age is leading us beyond both capitalism and socialism because both of the latter gave priority to the apple—either through competition for the biggest piece of it or through a paternalistic decision on how it will be distributed.

Mondragon has demonstrated that loving relationships can be given priority and institutionalized into a social order that can not only out-perform both capitalism and socialism on their own terms, but bring greater inner and social peace at the same time. Individual freedom is not compromised and each person freely takes responsibility for their interdependence with everyone else through a social system which maintains everyone in a position of equal power and familial solidarity.

We need to remember that Karl Marx died before the father of psychology,

Sigmund Freud, became well known. Marx's strength was not psychology. He made the fatal error of thinking that the end could be different from the process, that class struggle would bring a classless society.

It wasn't until Mohandas Gandhi that we heard a prominent person argue that capitalism and socialism were both lacking because they placed things before people and goals and process before self-definition. Gandhi's economic theory of "trusteeship" defined the relationship among the participants as more important than anything else, in much the same way as Father Arizmendi did. Father Jose Maria Arizmendi, going one step further, has clearly demonstrated how to institutionalize Gandhi's theories as a socioeconomic order. It appears it is the fulfillment of Gandhi's dream.

It may also be the realization of the hopes of our American founding mothers and fathers and every wave of immigrants to the present day who came to America searching for a better way. In the 18th and 19th centuries, they described their dream as a "cooperative commonwealth." In 1800, less than 2 percent of free Americans worked for someone else. To do so was viewed as one tiny step above slavery. Today, 95 percent of Americans work for someone else. The story of the U.S. during the 1800s is one of failed efforts by Americans to prevent the erosion of the "cooperative commonwealth" they knew in their rural townships. Neither capitalism nor socialism was their choice. Mondragon and the Relationship Age worldview may be what we have needed to guide us to the next stage in our evolutionary development as well as to the fulfillment of the original American, and human, dream.

The truth, we now know, is that cooperation is primary but nearly all still believe that competition is primary. What has been missing has been the understanding that competition is the lowest form of cooperation rather than an alternative to it and that cooperation cannot be escaped. As this awareness becomes pervasive, the building of Relationship Age societies will become a self-conscious agenda. Once that occurs there is nothing stopping it from emerging rapidly.

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CHAPTER 20

Cooperative Governance

ERVIN LASZLO

Concern over the governance—indeed, the governability—of contemporary societies is growing. Cooperative international governance is increasingly perceived as desirable; however, it is not clear whether such governance is feasible, nor is there agreement on the tasks with which it should be entrusted. This paper focuses on these issues in turn.

1. THE FEASIBILITY OF COOPERATIVE GOVERNANCE

Questions of feasibility can be approached from various angles: legal, institutional, political, etc. In the space of this paper these approaches cannot be exhaustively reviewed. Instead, an overview will be presented from a historical and individual-social psychological perspective.

In its legal and institutional form the modern nation-state dates only from the Peace of Westphalia, concluded in 1648. The concept became institutionalized throughout Europe in the 17th and 18th centuries and has spread to the far corners of the world in the great wave of decolonization after World War II. While developing countries objected to almost every concept they inherited from their former colonial masters, they never contested the validity of the principle of sovereign national states. As a result, today's world community consists of over 180 nation-states, and merely a handful of territories with non-sovereign status.

In the 20th century, national sovereignty has become sacrosanct. National governments agree on few things other than their refusal to relinquish their sovereign powers, either to subnational entities such as cantons, provinces, regions, republics, or states, or to supranational entities such as regional federations or authoritative international and global bodies. This unyielding adherence to national sovereignty is inscribed neither in the laws of history nor in the laws of human nature. It is the product of an epoch that is already passing. In the last decade of the 20th century, unilateral insistence on national sovereignty may have to yield to the exploration of more adapted forms of social and political organization.

Processes of globalization make changes in the organization of societies both urgent and imperative. The concentration of decision-making power in the hands of national governments is becoming dysfunctional, both for small and poor countries where the national level is undesirably restraining, and for large and diversified states where the national level is unduly constraining. It will be useful, and indeed necessary, to create new types of socio-political units, decentralized

according to specific spheres of competence. Communities that regulate the behavior and interaction of people in civil society should not be as large as the mainstream contemporary nation-states: the centers of decision should not be removed from the people whose lives are affected by the decisions. On the other hand, economic communities could be more extensive both in population and in geography: economies of scale are important in regard to natural resources, to labor-forces, as well as to markets. Cultural regions could be larger still, corresponding to the diffusion of the culture that provides the values and the cognitive maps that enable people to perceive and to act in their natural and social environment. The units of decision-making could be even broader when it comes to questions of defense, whether in the face of aggression from another society or aggression by a society vis-à-vis nature.

The aim of decentralization and diversification in the decision-making of contemporary nation-states is not utopian per se; its constraints, being institutional and legal rather than historical and psychological, are transcendable and temporal and not intrinsic and permanent. There are no insuperable factors in the psychology of individuals that would limit their allegiances to monolithic national states. No individual is obliged by his intellectual or emotional make-up to swear exclusive allegiance to one flag only, in the conviction that it symbolizes "my country, right or wrong." People can be loyal to several layers and units of society without being disloyal to any. They can be loyal to their community without giving up loyalty to their province, state, or region. They can be loyal to their region and also feel at one with an entire culture, and with the human family as a whole. As Europeans are Englishmen and Germans, Belgians and Italians as well as Europeans, and as Americans are New Englanders and Texans, Southerners and Pacific North-westerners as well as Americans, so people in all parts of the world can have both narrow and broad identities, even if the latter are underutilized and atrophied due to the dominance of the ideology of the nation-state.

In the next development of the institutional and political order of contemporary societies, the ideology of the nation-state need not be preserved. The historical process is already moving beyond the system of nation-states, even if the legal instruments are as yet underdeveloped and public recognition of the process is slow to emerge. The Europe of today is not a nation-state and it already provides a wider identity and an arena of cooperative decision-making for contemporary Europeans. The community-wide Europe is neither a source of confusion nor a ground for conflicting allegiances. Indeed, if the English and the Germans, the Belgians and the Italians would not persist in the legal fiction of forming sovereign nation-states, their Europeanness would unfold that much more, and action on the community-level would be greatly facilitated. In North America, New England, Dixie, and the Pacific Coast are not nation-states, but Americans identify themselves with these subnational regions in addition to identifying themselves with the U.S. as a whole. If the union of the states of America would not persist in claiming nation-state sovereignty for itself, the regional identities of its people could evolve and come to the fore, reducing alienation without weakening national identity.

Regional autonomy, in the guise of the "problem of nationalities" has become a survival problem in the Union of Soviet Republics, and it is also emerging as such

in the federation of the provinces of China. In all these giant units, a creative resolution of the problems posed by the claim of exclusive sovereignty is urgently needed.

The centralized structures of giant nation-states are a hindrance to the freedom and autonomy of their people. In a society that exceeds 60–80 million souls national governance tends to be dysfunctional. The periphery has a tendency to get detached from the capital, diversity interferes with unity, and structural disequilibria appear between rich and poor, city-dwellers and country-folk. Historically, communities that managed to conserve their identity through the centuries did not exceed a relatively modest population range—for example, the English, the French, the Dutch, the Finns, the Austrians and the Hungarians, to mention only a few in Europe. Even the Chinese and the Indians, enormous as their national populations are today, have evolved as regional cultures of relatively modest size and have consolidated into nation-states and grown to giant dimensions only in this century.

Cooperative governance appears feasible only if modern nation-states are decentralized. Transfers of sovereignty are required in both directions: from the federated level of large nation-states to their federated subunits, and upward, from the national level to the level of the continental subregion or region. As long as nation-states defend their full and exclusive sovereignty, cooperative governance will be a paper tiger. In this regard the experience of the two multipurpose global bodies called into being in this century is significant. The League of Nations broke apart when a belligerent nation-state began its territorial expansion leading to World War II; and the United Nations, though persisting in a legal and institutional form, is at the mercy of its nation-state members. It is not an effectively governing cooperative body but a forum for debate with a level of authority that does not go beyond mere recommendations. That some specialized agencies can nevertheless function in a comparatively effective manner is due to the consent of the U.N. member-states; and this is a consent that they can withhold or withdraw at their discretion, together with whatever funds and manpower they may contribute. In the last analysis the very name of the organization implies its limitations: “united nations” is, *sensu strictu*, a contradiction in terms. Nations, if sovereign, cannot be united. The latter is possible only if there is a transfer of sovereignty to the collective level of the partners in the union.

2. THE TASKS OF COOPERATIVE GOVERNANCE

Assuming, if only for the sake of argument, that effective transfers of sovereignty may take place as the international community heads into the 21st century, the question arises as to what ends and purposes such transfers should serve. In light of the history of the European Community—the body that comes closest to having achieved the status of cooperative international governance—the economic sphere is first to come to mind. On deeper reflection, however, the term “governance” does not appear proper when applied to economic processes. The governance of the economy backfires even when attempted on the national level, as the experience of

the East European socialist states demonstrates. On the cooperative level the problems would be compounded. The economy can be regulated in some respects, its processes coordinated and harmonized (as the EEC has done), but it should not be governed. The result would be dirigism in some form, with drawbacks that outweigh its advantages.

The concept of governance is no more felicitous when applied to the exchange of information. Although some information flows need careful surveillance—those, for example, that carry vital technological and strategic messages—the governance of information raises the specter of censorship which, even within the framework of a well-intentioned “information order,” would end up by doing more harm than good. Science, education, and culture in general, need not be transnationally “governed”, nor would health and social services be properly subjected to cooperative governance. There are, on the other hand, two areas where cooperative international governance is both urgent and imperative: the areas of **security** and **environment**. Both concern collective defense in the face of aggression: in the one case aggression aimed at a human society, and in the other aggression aimed by human society at nature.

The belief that national security would call for a powerful national defense force is as much of a fiction as national sovereignty, and it is strongly dependent on the latter. If a community does not claim unconditional sovereignty over its territory, it has good reasons to entrust the defense of its borders to joint peacekeeping forces. The logic of such a step has already penetrated in Europe: a European Defense Community, rejected by France when it was first proposed in the 1960s, is again in the making and may become reality before the end of the century. People in Scandinavia, the Benelux region, and on the rim of the Mediterranean seem open to proposals of joint defense forces. It may be more difficult to convince the majority of the English and the French to give up their national armed forces: their current national ethos includes a dream of major military status. But surprises cannot be ruled out, as a referendum conducted in Switzerland in November of 1989 illustrates. Although the Swiss army is a national institution long held in high esteem by the population, the Swiss socialists managed to collect enough signatures to force a referendum on whether or not to maintain it. The expectation was that not more than 5–6 percent of the population will vote for abolishing the army, but in fact over 30 percent did.

Medium and small European countries may readily espouse the position that it is pointless for them to maintain an expensive army apparatus when with much smaller expenditures they could assure good internal and external security—the former through a well-equipped police force or national guard, and the latter through community-level peacekeeping. But even if European states managed to evolve a joint defense system, neither the United States nor the Soviet Union seem ready to entrust their national defense to a peacekeeping force on the global-level that alone would be effective in their case. Although the United Nations peacekeeping forces proved their effectiveness in Cyprus, the Near East and the Middle East (and were honored with the Nobel Peace Prize in 1988), the record on global peacekeeping is not encouraging. Support for inserting such a force remains limited to chronic trouble-spots where the superpowers themselves are stymied.

The greater the military establishment, the more difficult it is to integrate it into a collective peacekeeping system.

Effective cooperative peacekeeping may be utopian as long as nation-states insist on their full sovereignty, but may become realistic as effective transfers occur from the nation-state level to the regional, and in some cases to the global, level. In the absence of such developments joint peacekeeping will be but a thinly disguised form of aggression, where forces with pre-emptive first-strike capability confront each other in a precarious balance of terror.

A cooperative global system of security has become imperative, especially since the level of thermal and chemical pollution produced by full-scale war—even if it were fought with conventional weapons—would irreversibly destroy the biosphere's delicate and already highly stressed balances. A third world war would have no winners. The losers would be all the people of the globe, whether they took part in the fighting or not.

On the other hand, a cooperative system of national, regional, and global security would enhance chances of economic prosperity. The economies would be freed from the burden of maintaining costly military establishments and could use their human and financial resources for productive ends. The advantages, as the postwar "economic miracles" of both Germany and Japan demonstrate, could be considerable.

The second area where cooperative governance is imperative is the environment. In this context "environment" stands for the biosphere as a whole, the total system in which humanity and nature are integral elements and interdependent partners.

Humanity, as other living species, can only survive in an environment where basic biospheric balances are properly maintained. As just noted, these balances have already been seriously stressed. We are on the way to a higher global heat balance; to some extent the hothouse effect has become irreversible. We have thinned the ozone layer through our use of fluorocarbons; and this, too, has passed the threshold of full reversibility. We have killed off countless species, and they can never be regenerated. We threaten a third of the planet's total land surface with desertification, and may have already sealed the fate of several tropical rainforests. Only time can tell the extent of the damage we have wrought, but it would be foolish to wait until time does tell. With each passing day the processes become one degree more difficult to turn around.

The preservation of the essential balances as well as the richness and diversity of the biosphere is a global task. In no other area is "acting locally" as much in need of "thinking globally" as in this sphere. Global thinking must find concrete expression in cooperative action by all societies of the human community without exception.

The basic objectives of cooperative governance in regard to the environment are widely known and relatively uncontroversial. They can be grouped in three basic sets, where one set focuses on the regulation of the mining and use of natural resources; a second on the safeguarding of the balances and regenerative cycles of nature; and the third on the creation and maintenance of capacities for dealing with environmental emergencies.

The principles that would best govern the use of natural resources are the

stewardship principle as regards resources within national territories, and the collective heritage principle regarding territories outside national borders. Today, sovereign nation-states consider themselves the absolute owners of the forests, wetlands, croplands, rivers, and lakes that fall within their national territory, as well as of the metals, minerals and fuels found on or under the land and on the continental shelves of territorial seas. Consequently their use of natural resources can, and often does, do violence to nature. Roman law specified “*jus utendi et abutendi*”—the right to use is at the same time the right to abuse. Nation-states can be depended upon to rectify their behavior only if instead of claiming the sovereign right to use and to abuse nature, they would subscribe to the principle that they are stewards of the biospheric resources that happen to fall within their borders.

Parallel considerations apply to resources located outside national territories. The great reservoirs of industrially valuable metals and minerals on the continental shelves of the sea, and even in polar regions, must not be irresponsibly depleted any more than resources within national territories. The collective heritage principle, applying to extra-territorial resources, could govern global accords specifying access and use, preventing unfair exploitation by technologically and/or financially powerful actors.

Another set of measures, aiming at safeguarding the balances and regenerative cycles of nature, has goals such as the setting and enforcing of rigorous controls on the emission of chlorofluorocarbons (CFCs), and on the burning of fossil fuels; the setting of upper limits on the use of trace gases (such as carbon and nitrous oxides, hydrocarbons and methane); the designing and implementing of major reforestation programs; the designation of perhaps up to 10 percent of the planet's land surface as protected areas for the on-site preservation of genetic resources; and the carrying out of soil conservation programs on impacted areas.

A third set of measures needs to focus on the creation and maintenance of environmental emergency capabilities. The objectives include the identification of geographic regions that are vulnerable to flooding if and when the polar icecap begins to melt; the warning and if necessary the relocating of coastal populations threatened by inundation; the retraining and relocating of farmers affected by changing weather patterns; and the maintenance of adequate rescue capabilities for use in the event of ecodisasters and ecocatastrophes.

Such measures need to be globally cooperative, and must have the status of enforceable law. Effective enforcement presupposes, however, that the corresponding aspects of national sovereignty are transferred to a collectively constituted global-level authority with a mandate to safeguard the viability of the biosphere.

Both the security and the environmental dimensions of cooperative governance are urgent and imperative. In addition to the upward transfer of national sovereignty, implementation presupposes a resolution of the question of funding. Voluntary contributions of funds would be neither adequate nor reliable; and mandated contributions, if they are not to be coercive, need to identify the source of the funds. In regard to collective security, this would not be a problem: joint peacekeeping, whether on the regional or on the global level, could be entirely financed by the savings achieved by member states thanks to the reduction of their military and

defense budgets. There would even be excesses, which members could use to finance development, economic and technological modernization, health and social services, and other expenditures they deem essential.

Unless savings from the security area were to be transferred to the area of the environment (which would preempt or reduce the savings available to member states for their own purposes), the environmental area of cooperative governance would have to find its own funding base. A likely source appears to be environmental taxation. Environmental taxes could not only raise funds for biosphere-safeguarding joint operations; they could also have beneficial effects in re-orienting economic activities along environmentally sound lines. They need not be an added burden on the economies: states could compensate for the additional taxes by reducing others, such as corporate and personal income taxes, and value-added taxes. The specific mix could be left to individual states; it would be enough that they introduce sufficient tax incentives to redirect their economic activity from polluting and wasteful, to clean and sustainable modes of operation. (For example, taxes could be introduced on the production and use of fossil and of hazardous nuclear energies: this would create incentives for the research, development, and application of renewable, clean, and safe energies, and enhance energy efficiency. Taxes on polluted waste water and on clean water-use above specific thresholds would induce water recycling, internal purification, and efficiency in water use. Similarly, taxes on unsorted solid waste, and proportionately higher taxes on hazardous waste would prompt improvement in product design, production processes, internal recycling and detoxification, as well as in technology choices and corresponding consumer preferences. Taxes could be levied even on urban and industrial sprawl, making it more efficient to clean up unused or derelict industrial and urban areas than to pave over virgin land.)

In the late 20th century the processes of interaction among societies have transcended national borders in almost every vital area. Only the principles of governance have remained what they were three hundred and fifty years ago. The time for cooperative international governance is ripe. Its spheres of application need to be carefully specified and delimited, and the creation of giant bureaucracies and rigid hierarchies must be consciously averted.

In the last analysis, decision-making can grow to the international dimension if, and only if, the sacrosanct nature of national sovereignty is surrendered. A full recognition of the historical obsolescence of that principle is the single greatest precondition of recovering the governability of contemporary societies in regard to two of the most pressing issues of our times: world security, and biospheric sustainability.

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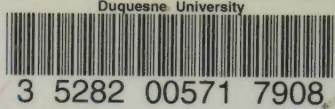
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