

Choose Between Cooperation and Annihilation: A Mental Mapping Project Towards a more Generously Directed Altruism

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Abstract

The fundamental design principles of Nature are based on cooperation, biological feedback, adaptation to changing conditions and promoting ecological diversity. Common human survival themes should, therefore, also echo this pattern and include more cooperation and less conflict, living within our ecological means, and living in harmony with the environment and ourselves. We have long had sufficient mind-power and with recently acquired scientific understandings and renewed bioethical awarenesses, are now facilitated to increase our survival fitness - if we choose. What is required is to mature emotionally and catch-up to our mind's vast potential by ethically managing our own fitness as a species. When it comes to, for example, killing thousands, even millions, of our own and other species in futile ideological competition, fueled by the random horrors of terrorism and coordinated warfare, we can no longer accept this as being a necessary and inevitable part of life. Our innately flexible intelligence can rescue us because within our collective biological nature exist strong survival instincts such as justice, empathy, love and respect for the freedom and lives of others. It is the further refinement of these positive biological instincts that can provide us with the necessary assets in the present struggle for adaptive survival. However, the global community must agree on forward-thinking bioethical standards when applying the contributions from science and technology. It is essential, therefore, to consider modern scientific and technological applications alongside some measure of ethical consensus. We need, as a society, to keep track of powerful technological developments despite the benefits associated with these gains. The present paper seeks to draw together bioscience-bioethics¹ in order to heighten general awareness of current bioethical issues raised by biological research and its applications. Thus, the enriched sum of us, irrespective of background, can come to both an informed opinion and make decisions in the spirit of intelligent altruistic cooperation. A bioscience-bioethics cooperative friendship alliance, based on Nature's model, is proposed to extract wisdom from human diversity, beliefs, attitudes and values, and to take its place in the integrated mental mapping project of the human mind (Macer, 2002).

¹ Bioscience ethics acts as a practical interface between science and bioethics. It links scientific endeavor and its application into adaptive forms of bioethical consensus. Its major elements are increased understanding of biological systems, responsible use of technology and curtailment of ethnocentric debates in tune with new scientific insights (Pollard, 2002).

Cooperative Behaviour: Historical Perspective

Increasingly scholars are warning us that the nature/culture dualism, which serves to separate humanity from the rest of Nature, is the primary cause of modern ecological crises. We urgently need to understanding that the natural environment is not an endless resource just for the taking; consequently, we have to work out a better relationship with reality that underpins an ecologically sustainable and just ethics - one in which the health of the earth becomes the context and norm for bioethics. Human beings, particularly in industrialized nations, have become technocrats in whom their collective minds have elevated technology and the production of machines as the ruling mythology of their times. While thus being consumed, we seem to have forgotten that Nature herself is not a passive entity and that her resources cannot be appropriated indefinitely for the manufacture of increasing quantities of non-recyclable goods and toxic waste production. It seems to me that if ethics is to effectively advance secular thought and reform disciplines such as economics, political theory, sociology, psychology and the natural sciences, it is essential to rethink old maladaptive assumptions. We need alternative practical strategies grounded in ecologically friendly and just principles. To save the planet and ourselves we have to remove the cultural constraints that see Nature as 'a wild resource for our exclusive subjugation and exploitation' and move forward toward wisdom through understanding, cooperation and stewardship. Stewardship means taking care of life's support systems. Evidently, such a fundamental change in cultural perspective requires commitment, planning, hard work, humility and a good working knowledge of Earth's biological support systems. By relinquishing our futile attempts to be in charge of the world, we may even open ourselves up to new awarenesses, including the certainty that the world has an independent existing not bound to our own destiny. Life will go on with or without us and it's our choice whether we remain part of the diversity of life or not. It may be opportune to remind ourselves that over three billion years of plant and animal life has preceded the evolution of human beings - an excellent demonstration that the earth has evolved quite well without human intervention for a very long time.

Interdependency and interrelatedness are trademarks of life as it coevolved with its essential elements; water, air, soil, minerals and other life-forms. The Gaia hypothesis, for example, posits that the earth itself is a living self-regulating organism in which humans play a vital part but whose activities must be healthy for, and accountable to, the sustainable wellbeing of the whole planet (Lovelock, 1995). Human beings may be exceptional latecomers to the planet but that does not exempt them from being fundamentally interdependent with the rest of Nature. Especially now that we are experiencing rapid environmental and social change, survival increasingly depends on our ability to creatively adapt to new possibilities. Steadfastness to losing strategies (see 'The Tragedy of Conflict' section below) encourages resistance to change - not a good evolutionary strategy in an age of rapid technological advance and climatic instability. Since the human animal is fully part of nature, it logically follows that human culture is also fully part of nature; thus, 'on the ball' culture may potentially become an immensely important factor in the evolution of life. Unique human acts of transcendence through intelligence, language, traditions, ethnicities - consciousness even - may become

contributions vital in establishing continuity with the rest of the biosphere. We are given the choice to further our existence constructively or destructively, but choice bears consequences and responsibilities not only to ourselves but toward the next and subsequent generations - to those who do not have the luxury to choose between preferred options. Breaking from non-adaptive conditioned beliefs, whether they be historical constraints or other valued traditions, may help each one of us to access a level of new found freedom, peace and wellbeing.

Altruism And Cooperation - Nature's 'Deep Design' Strategy

The fundamental design principles of Nature are based on cooperation, biological feedback, adaptation to changing conditions and promoting ecological diversity. Nature is not predominantly 'red in tooth and claw' because savagery is not a beneficial strategy and is not the usual direction of evolutionary change. Rather, the natural world is full of elaborate forms of cooperation and symbioses that extend far beyond the species boundaries. The term 'symbiosis' simply means 'living together', without any implied value judgments. In the biological literature, however, the term is also used to describe a particular category of relationship where all parties benefit from the interaction. In this case the relationship is called either symbiosis or mutualism. Typically, populations of organisms interact with one another in complex and often surprising ways. It is common for two (or more) organisms to evolve together for mutual benefit; for example, many plants have mutualistic relationships with their pollinators. Usually the interactions are not highly species-specific. Symbioses underpinning biogeochemical or nutrient cycles, however, involve specific relationships with microorganisms and are essential in the production of energy and nutrients. Nutrient cycles, in cycling chemical elements through the biotic and geological components of all ecosystems, are well balanced, fundamental ecological processes. The synthesizing component of the cycle involves nutrients being taken up from the soil by plant roots, translocated within the plant and eventually, via the process of photosynthesis, food being distributed throughout the food web, including us. The recycling component of the cycle returns to the soil the nutrients contained within the dead biomass so that the whole process can be repeated. Fortunately, there is a growing appreciation about the central role that symbionts play in ecological processes since, by the use of modern computer simulations, it is now possible to confirm that extensive cooperation is an evolutionary stable strategy because it produces a benign environment in which everybody thrives.

Common human survival themes should, therefore, also echo Nature's strategy and include more cooperation and less conflict, living within our ecological means, and living in harmony with the environment and ourselves. Humans have long had sufficient brainpower and now with recently acquired scientific understandings and renewed bioethical awareness, are facilitated to increase the species' survival fitness - if we choose. All that is really required - the big ask - is for us to grow up emotionally in order to catch-up to our brain's vast potential and ethically manage our own fitness. To assist, evolution has embedded within us strong survival instincts such as free choice, flexible intelligence, foresight, balancing risks adaptively, justice, empathy, love and respect for the freedom and lives of others. With the further refinement of these positive biological

attributes it should be possible for us to overcome the worst of arrogant anthropocentric view points and survive more adaptively. After all, the biosphere's integrity is, in the final analysis, also the integrity of the human species as part of creation.

Is It Competition Or Cooperation?

'Man is by nature a social creature: an individual who is unsocial naturally and not accidentally is either beneath our notice or more than human. Society is something in nature that precedes the individual. Anyone who either cannot lead the common life or is so self-sufficient as not to need to and therefore does not partake of society is either a beast or a God'. (Aristotle, 328 B.C.E).

In human history we have passed the stage of overcoming our natural environment; we no longer fear for food or shelter. As a consequence we can now pause and examine ourselves a little more objectively and revalue the intrinsic quality of the ethics supporting modern social/cultural existence. However, being preoccupied with extant ethics is only useful if this preoccupation is also accompanied by increased intellectual maturity and flexibility. We desperately need to show evidence of maturity as excellently expressed by Darryl Macer's words 'A mature society is one which has developed some of the social and behavioral tools to balance bioethical principles, and apply them to new situations raised by technology' (Macer, 1998; page 84). In substance, a mature society is one that makes use of both its emotional and intellectual intelligences. We have no need to remind ourselves that knowledge is power, and that the combination of knowledge and power demands a mature duty of care. A society that is able to ethically balance knowledge and power is courageous; a society that is prepared to adopt new ways of being is mature. Scientists have to take care that their research advances do not go beyond their reach; they must also ensure that the broader society is given the opportunity to weigh the benefits of their research against the risks by maintaining an open and honest dialogue. As our scientific, medical and technological skills continue to advance, we as a society must develop the capacity for foresight, compassion and ethical consideration and, as described above, there is no better example to follow than that given us by Nature herself.

In order to address the pattern of human domination over Nature it may be useful to analyze our psychosocial conditioning and critically examine the prototype mind-set that sees everything in terms of competition. To demonstrate, I'll detail recent scientific backflips in relation to the 'theory of sperm competition'. Sperm competition theory posits a postcopulatory perspective of sexual selection that occurs under polyandrous (female polygamy) conditions. Put simply the theory states that sperm wars are generated where sperm from different individuals compete for the same egg, as do different ejaculates and different sperm within the same ejaculate. In order to maximize their chance of reproductive success at times of intense sperm competition, promiscuous males are expected to invest more in ejaculate characteristics; such as, higher sperm production per gram of testicular tissue, bigger testes and larger ejaculate volumes. Fresh evidence, however, has revealed that reproductive success is attained by adaptively balancing competition and intra-ejaculate sperm cooperation. Thus; in situations of female

promiscuity, both sperm competition and cooperation are fitness enhancing strategies. However, this winning strategy was ignored and remained unsighted for the reason that preference was given to the sperm war theory owing to the human predilection for viewing Nature as essentially conflict-based.

The first examples of sperm co-operation were reported for molluscs and insects (Sivinski, 1984; Hayashi, 1996), which was later extended to the Mammalia. For example, in the South American opossums, sperm conjugate to form pairs during sperm maturation and disengage immediately before fertilization (Moore, 1996). Paired sperm move toward the ovum significantly faster compared with singles increasing their chance of fertilization demonstrating that 'altruistic' post-copulatory behavior increases the chance for related cooperating sperm to win over others competing for fertilization. For true altruism to take place, the fertilizing capacity of one sperm is compromised or sacrificed to benefit another. Recently indisputable evidence has also been provided for Eutherian mammals where sperm within an Eutherian ejaculate can work cooperatively to the point that they will engage in 'altruistic' behavior. Harry Moore and his collaborators (Moore et al, 2002) convincingly established that in the highly promiscuous common wood mouse (*Apodemus sylvaticus*), sperm exhibit a unique morphological transformation that results in cooperative aggregations which significantly increase sperm progressive motility. In brief; on ejaculation sperm are suspended singly and demonstrate good forward motility but within 1-5 minutes, the apical hook of each sperm adheres to the apical hooks, or to the flagellum, of other sperm forming motile clumps and then motile 'trains' of spermatozoa comprising hundreds to several thousand cells. Sperm trains exhibit rapid progressive motility with a sinusoidal motion significantly greater, as determined by computer-assisted sperm analysis, than for single spermatozoa. Eventual dispersal of sperm trains is associated with most of the sperm undergoing premature acrosome reactions where the acrosome reaction is associated with the lost capacity to bind to the zona pellucida and fertilize the egg. Therefore, cells undergoing an acrosome reaction in aggregations remote from the egg are altruistic in that they help sperm transport to the egg but compromise their own fertilizing ability. While such distinctive gamete behavior with unique morphological features as seen in the wood mouse is rare, other polyandrous species have also demonstrated evidence to engage in some level of adaptive ejaculate flexibility in response to socio-sexual cues indicative of rival male sperm competition and adaptive reproductive behaviors. Recent reviews by Wedell et al (2002) and Birkhead & Pizzari (2002) are recommended to the interested reader.

The Tragedy Of Conflict

The hostile actions of war are a deliberate attempt to destroy the ecology that sustains life and is, thus, appropriately categorized as 'ecocide'. Popular forms of ecocide are scorched-earth campaigns aided and abetted by bombing and military ground sweeps in order to completely deforest, depopulate and destroy the environment. Since such brutal actions cause long-term and often irreversible damage to ecosystems, militaristic insurgencies and counterinsurgencies are violations of right conduct at many levels, both within human communities, along boundaries of social and cultural difference, and within our broader biotic communities. International militarism and the deployment of

scarce resources on sophisticated, or not so sophisticated, weaponry capable of escalating violence can no longer be tolerated despite awareness that warfare is the inevitable consequence of a multitude of humans forced by poverty, mismanagement, greed and population pressures, into overexploiting their natural resources. It is easy to see the cycle of how the resulting ecological poverty then becomes a primary cause of further aggression. Once war is established, the economy then becomes predatory by consuming its scarce resources to further the conflict, trapping its inhabitants in an increasing cycle of war-related debt and further expanding poverty. The one obvious unifying characteristic of all institutionalized and free-wheeling conflicts is the lack of respect for human and environmental rights. War violates fundamental human decency especially when horrific atrocities are perpetrated under the banner of false justice and mock righteousness.

If we do not soon curb our high rates of ecologically unsustainable consumption defended through an ecologically disastrous militarism we, as a species, are destined for extinction. By pointlessly destroying the environment without acknowledgment or reciprocity is a losing evolutionary strategy. Let us remind ourselves again that a mature species takes responsibility for the ecological, social, and personal ramifications of all our actions. In order for our differences to become enriching, we must appreciate and claim our intrinsic value within Nature and celebrate our difference with the larger diversity of life. In this context initiatives like Professor Darryl Macer's east-west dialogue is critical (see Eubios Ethics Institute's website). Importantly, recognizing and valuing other expressions of human diversity that contributes constructively to the richness of the human and ecological fabric, whether cultural, social, religious or spiritual, can only stand us in good stead in overcoming our present environmental dilemma. The spiritual impulse towards meaning and value in friendships has to be extended towards the whole of creation. Only this can spell the difference between a friendly environment and no environment for our descendants.

International militarism in the form of war and preparations for war is the greatest ongoing threat and obstacle to sustainability and survival into the future. The rate of ecologically damaging change of the earth under human influences has accelerated to the point that humanity faces the possibility of causing its own extinction and severely damaging the whole biosphere. By appropriating and fighting over all available resources for ourselves, we are witnessing the last desperate struggle for survival of the unique Quaternary fauna and flora developed over the last two million years of geological time, from the Pleistocene to the present. The Quaternary period was characterized by the flourishing of an astonishing diversity of life, including the appearance of *Homo sapiens*. Therefore, warfare is a costly losing cooperative venture - poisoning our neighbour and wasting common commodities are not matters of privacy or free marketeering or national sovereignty; they are serious ethical offences against others that demand public regulations and prohibitions. The question of justice also means that resolving the problem of poverty is a critical part of any responsible solution to the problem of pollution, as the poor in both developed and developing nations typically are the most adversely affected and have the least options to avoid the toxic effects of pollution. A

basic ethical issue involved here is responsibility to future generations, both human and other kind, that are endangered by human over-appropriation.

Ecojustice implies the need to change our way of thinking by challenging inherited values and assumptions, particularly those that have supported ecologically damaging practices. We have to relearn acceptable limits of behavior, but since we are the cutting edge of Nature's experiment in consciousness and thoughtfulness, we can work out what needs to be done. We could follow Gaia's ethic by accepting that the wellbeing of each life form depends on the interdependent wellbeing of the whole. The challenge is to develop a diversity of adaptive interrelationships at all levels of life, including symbiotic microorganisms. Scientific research is giving us the knowledge that, at every level, the biology of the ecosystem is shaped by long-term intimate associations with larger organisms such as animals and plants, and that their complexity is further reflected in their interactions with microorganisms. Valuing natural biodiversity in purely economic or monetary terms is an insult to the Biosphere; as is sickening militaristic behavior which should be outlawed. To establish a workable ethical consensus society must be willing to alter its view in the face of new information. It is a simple fact that nothing remains the same. Evolution is inevitable whether it be slow growth and change through natural evolutionary processes, or rapid through our intervention and technological applications deployed either positively or negatively. Emotional maturity tells us how to choose to be responsible while excuses keep us stuck in the present quagmire - we can choose to be a lost cause or we can choose to adapt and become empowered. In a world where the unit of evolution is the group, biodiversity and cooperation is the evolutionary strategy for success. Just as biodiversity provides ecological stability so diversity of human ideas provides national stability.



Figure 1. Encircling hands of the term fetus defending global integrity

Proposal: A Bioscience-Bioethics Friendship Co-Operative

Love experienced through justice is the right relation at all levels of creation because it recognizes our common origins, mutual dependencies, and shared destiny with the whole of the biosphere. It follows, therefore, that specific love can progress to general love of life; that is, the love of nature as the love of neighbor universalized (Macer, 1998). Friendship can be viewed as committed love in the maintenance of an adequate quality of life for one's self and one's community which is experienced through cooperation, respect and gratitude for our embrace inside Nature. Therefore, I would like to propose a bioscience-bioethics friendship cooperative representing the adaptive amalgamation of current ideas based in science and bioethics (Figure 1). To incorporate current scientific insights of practical significance within a cultural context is an aim of bioethics. Bioscience ethics, unencumbered by the formal structure of ethics, can assist in the process of biological understanding (Pollard, 2002). The science of today cannot be separated from its application in society, thus bioscience and bioethics cannot be separated either. To quote Cleminson 'Scientists study a world from which they are a part not a world from which they are apart'.²

Figure 1 symbolizes an application for harmony on the global scale. Fortuitously, numerous opportunities for peaceful co-existence in our modern technological age exist, as is demonstrated by our vastly interconnected global market place and the World Wide Web. On the other hand, consider global warming and climate change or nuclear power. The global community must agree on some bioethical consensus when applying the contributions from science. It is essential to consider, therefore, modern scientific and technological applications alongside some measure of ethical consensus. We need, as a society, to keep track of powerful technological advances despite the benefits associated with these gains. Knowledge is empowering and informed decisions can be made only if one is cognizant; therefore, it is absolutely essential to consider scientific research and technological applications alongside ethical consensus. Ethics alone is stagnant - rather it is important to use the existing ethical framework to weigh up the risk of harm against the intended benefits of any new technology. The bioethical issues are not novel as they still relate to 'love of life' - the technologies are. Adaptive ethical decisions cannot be reached in scientific ignorance but both are mutually empowering. To illustrate in simple terms, bioscience ethics applies bioethical principles to new situations raised by science and technology. Through science and technology we now have a better idea of knowing how and where we are. But with this comes confusion about what we ought to do and its justification. The atomic bombs dropped on Nagasaki and Hiroshima clearly demonstrate what, in the absence of acceptable ethical standards can happen; and with new technology the state of the world may move beyond the most shocking. The development and use of nuclear weapons is an extremely unethical use of radiation technology. The threat of nuclear warfare remains and it appears all too easy for a country to develop nuclear capabilities and threaten another with them. On the other hand, medical use of radiation technology has revolutionized medicine, an example of the ethical use of the technology.

² As cited in Alters B 'Whose Nature of Science?' *Journal of Research in Science Teaching* 34:1997;39-55 page 41.

A friendship co-operative as proposed here is bound to extract wisdom from human diversity, beliefs, attitudes and values because friendship informs us about the subtleties of love and caring - universal prerequisites for a just, participatory society. Cooperation, being friendly, also implied the gradual blurring of divisions between human and animal life when united creative intelligences and emotional wisdoms play key roles in adaptively regulating human behaviour. Significantly, cooperatives are based on democratic principles; that is, collegueship between parties possessing distinctive principles in order to gain special goals like the construction of an information coalition or mental ideas map. Because cooperatives function by using elements of altruism, generosity and open-mindedness in the pursuit of specific goals, the free flow of new ideas is encouraged helping in the reassessment of ourselves culturally. Humans are full of intellectual ideas and given more emotional wisdom we may be able to justify our dominant position in creation, provide ourselves with a renewed meaning for life and, with luck, find our personal road to enlightenment.

The Figure 2 illustrates ways in which understanding may boost stewardship and propel humans to participate more fully within ecosystems where diversity, not unity, is the basis of health.

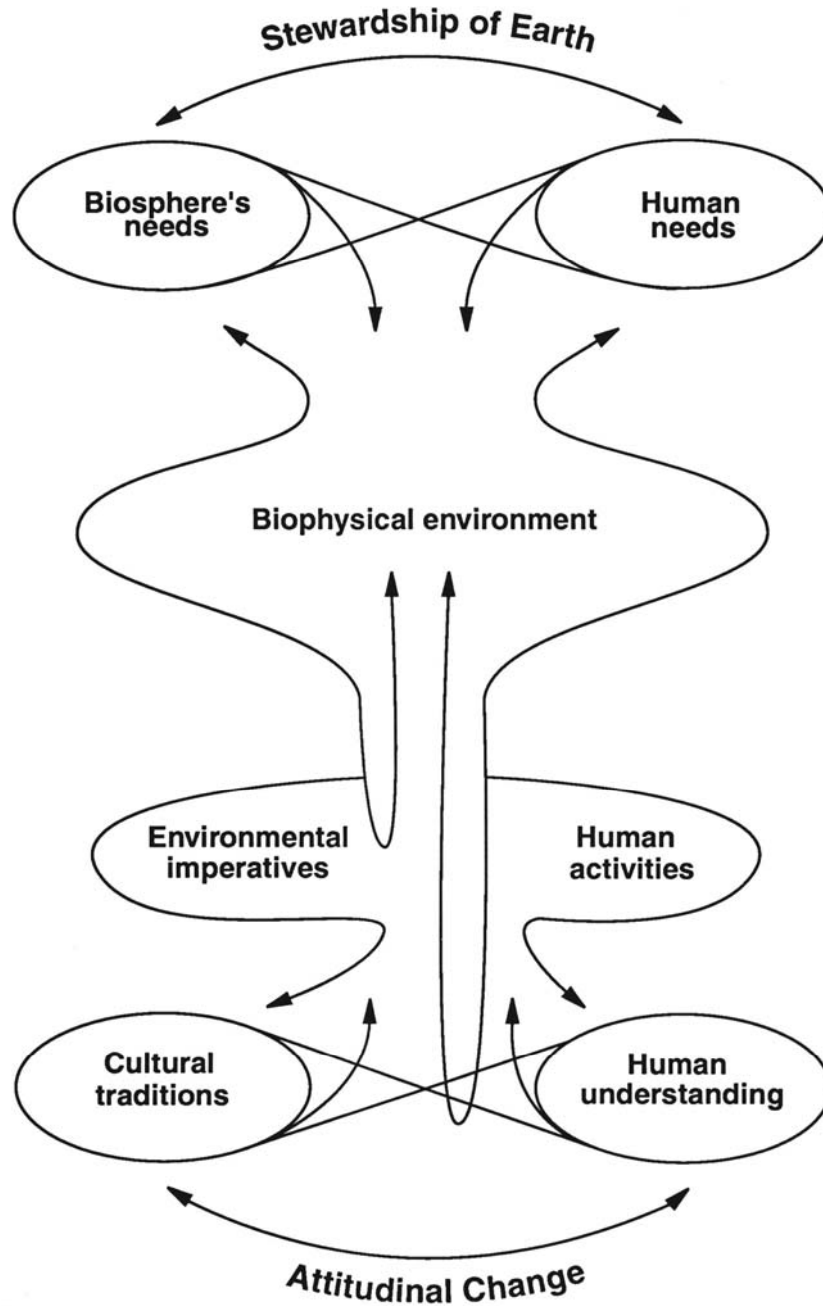


Figure 2: Earth's biological, physical, cultural and spiritual components interact as one self-sustaining organism that appears to create the physiological conditions to promote life's succession (from Pollard 2002 page 218).

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