

The Inherent Value of Art
at the End of the Age of Agriculture

by
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Biography of Karun Koernig

Karun Koernig has held the position of Activities Director for the Jeffrey Rubinoff Sculpture Park for the past 2 years. For the past 15 years he has been the Senior Manager of the Environmental Youth Alliance International Division. He currently works in Kenya as a UN-HABITAT consultant on micro-enterprise projects for youth in slums. Four years ago he founded an environmental consultancy that is active today. Karun Koernig graduated with honours from Simon Fraser University, where he majored in Political Science with a focus was on local government.

Preface and Acknowledgement of Sources

The insights that evolved with and from Jeffrey Rubinoff's body of sculptural work are the inspiration for this essay. These insights were discussed by Jeffrey Rubinoff and myself over the course of a year and were transcribed collaboratively and finally edited by Mark Daniel Cohen. They were first introduced to the general public at The Jeffrey Rubinoff Sculpture Park Inaugural Forum in May 2008. After the Inaugural Forum, it was decided that a subset of these themes should be worked into full fledged ideas by a collegial group of Forum participants with the aim of extending them to a wider audience.

Within this essay, all ideas about the evolution of life have been paraphrased from my understanding of Charles Darwin's *Origin of Species*, as well as Richard Dawkins *The Selfish Gene* and *The God Delusion*. It is intended that the reader will recognize many of their key, and well known, concepts clothed in slightly different language. It was not my desire to distort or reinvent, but to simply restate this compelling explanation for the origins of life.

Some of my ideas related to patterns of information and matter are based on Ray Kurzweil's *The Singularity is Near*. In that work he argues that the next stage of the evolution of intelligence will be a non-biological one of our own making. While I don't agree fully with many of his arguments, his thinking helped model my concepts of the computation of group consciousness, the evolvable consciousness, and what marks the transitions between Ages.

My understanding of the working of the human mind has been influenced by V.S. Ramachandran's and Sandra Blakeslee's *Phantoms in the Brain*. Their work enhanced my knowledge of neurology and influenced my thinking on how the human brain can generate analogies so powerful they can contradict information from our sensory nervous system.

Introduction

This essay postulates that we are living at the End Age of Agriculture, meaning at a time when the order of consciousness that evolved agriculture, and subsequently evolved as a necessity of it, no longer serves an adaptive purpose. This does not mean that upon entering the next Age, we will not need agriculture. Ages will be defined by the changes in the order of consciousness.

However, it is not our main ambition to engage in a historical debate about the End of the Age of Agriculture. The only purpose of the former contention is to highlight the value of art at this particular time. To do this I will draw on my knowledge of history, the science of evolution and my own self-reflective insights on the value of art in general. Since I am not an expert in any of these fields, we held a two-day critical workshop including Jeffrey Rubinoff and six young artists and arts educators who were asked to question, offer alternatives, and extend the premises and conclusions of this essay. Subsequent to this critical workshop we have engaged two Ph.D. candidates, one in Zoology and one in Art History, to contribute to the essay. The role of the former was to fact check my account of the origins of life, while the latter worked to relate the ideas I have posited to larger issues within Art History.

The purpose of this essay is to extend and develop the idea that art holds special value at this time. It is hoped that these ideas, artistic or historical, will be deemed to yield useful and interesting questions, consequences and further insights. The ultimate objective of this joint intellectual effort will be to stimulate artists to seriously address their role in the evolution of human consciousness.

Chapter 1: Patterns, Order and Evolvable Consciousness

“Art is an act of will in accord with a mature conscience.”¹
– Jeffrey Rubinoff

The aim of what follows is an explication of Rubinoff’s above definition of art. It was prepared for and presented by Karun Koernig at the May 2009 Company of Ideas Forum.

This essay is about the evolution of human consciousness and the role of artists as one of its driving forces. Consciousness is what we feel makes us subjectively us, and what we see as differentiating us from other life forms. We experience consciousness in ourselves and assume it in other humans through a shared biology, use of language, and response to similar situations. We can see it grow in ourselves and others upon gaining more information and experience. But as commonplace as our experience and conception of it is, it is hard to speak usefully about any of its differentiated aspects, without recourse purely to speculative theory. So to arrive at a useful statement about the role of artists in the evolution of human consciousness, this essay will attempt to map out some of its aspects that can be differentiated on an evidentiary basis.

To do this, I will briefly outline the current state of knowledge about the evolution of life itself, which is the necessary condition for human consciousness. This is especially important because, in my judgment, human knowledge has progressed to the point where consciousness itself can be convincingly explained as a spontaneously emergent property of nature and *matter* itself. I regard this human knowledge as an achievement of the highest order and a statement of profound connectedness with nature, of the importance and fragility of life, and of our larger responsibility as the locus of potential for the further evolution of consciousness.

This prospect may be frightening if you are used to conceptualizing “that thing that is essentially human”, our spirit or soul, as a small piece of a supernatural immortal entity. However, through careful use of language I hope to convince you that all the properties normally ascribed to the sacred, sublime or spiritual, are still wholeheartedly alive within a conception of the emergence of life and consciousness from *matter*.

By *material* what is meant is the *matter*, or aggregate of energy, particles and other as-yet unknown forces that seem to act in a constrained relationship with each other in this universe. Since the understanding of *material* includes as-yet unknown forces, supernatural (or non-material) explanations for life must assume a force that interacts with “regular” *matter*, but is not bound by the relationships of matter in our universe. I find this idea interesting but ultimately unproductive, however, because non-circular arguments based on evidence for the supernatural have never been established. Even worse are musings about the supernatural that

¹ www.rubinoffsculpturepark.org – Definition of art appears at the bottom of the home page

actually excuse humans from a serious examination of what our responsibility is, should the material explanation be true.

So we will proceed from the assumption that, given a universe with suitable conditions, *matter* can through billions of years of *evolution* organize itself into *consciousness*. The following is an explanation of my understanding of the current state of human knowledge about the evolution of life on our planet based on the acknowledged sources listed above. As life is currently assumed to have evolved in complexity from the tiniest of arrangements of matter, it is there that we must begin if we are to eventually understand the phenomenon of our own consciousness.

What is truly important for humans to understand about our relation to the material world is that through *evolution*, *matter* has been able to organize itself into ever more *complex* arrangements or patterns. This is clear to anyone who examines the evidence of large, complex life forms emerging from far simpler ones over millions of years. A necessary condition for *evolution* is that a *pattern* is formed and that it encodes the required information to form a specific arrangement of matter as well as the mechanism that reconstructs it. On Earth, self-replicating patterns are living organisms made up of carbon-based molecules. Successful *organisms* are the ones that have increased the degree of *order* within the information contained in their own pattern. Throughout this process, *order* expresses itself as organization of information that can ensure the further propagation of each particular *organism* within its environment, relative to other *organisms* attempting the same.

It is important to note that, while evolution has resulted in some very *complex* organisms (such as humans), and there has been an increase at the highest level of complexity over the history of life, the majority of life is and always has been quite simple. The overwhelming majority of species and world biomass are very simple microscopic bacteria. When, through natural selection, more adaptive organisms supplant less adaptive organisms in a particular situation, they do so without any intrinsic direction in terms of complexity—organisms will be selected for either increased or decreased complexity in response to local environmental conditions. In many cases a lineage will lose a complex trait if it provides no adaptive advantage. For instance, there are many cave dwelling species that live in complete darkness and no longer have eyes, even though their ancestors that lived above ground possessed functioning eyes. Many other organisms maintain the same simple traits over thousands of years because they work very well for those organisms in the conditions in which they live. It is crucial here to avoid the misconception that most life is evolving to become more complex. Since life was very simple billions of years ago, and there has been an increase in the diversity of life through time (due to mutations increasing variation), it is inevitable that we now have more organisms that are more complex than there were before. However, this represents an increase in the maximum level of complexity (i.e. the small number of values in the far right side of a distribution of values), rather than an increase in the mode of complexity (i.e. the most common values in a distribution of values). If evolution was a process that actively

produced complexity, then we would expect to see an increase in both the maximum and the mode of complexity of life.²

The essential point is that increased *complexity* is not the overwhelming result of the *ordering* process of evolution, but only small by-product. However, for human beings it is a significant byproduct, because cognition and consciousness are based on a substrate of extraordinarily high levels of complexity.

As populations of organisms evolve over extended periods of time (measured in thousands of millennia), they develop innate responses to the environmental and competitive challenges that increase their chances of successful propagation. Eventually, these challenges become too complex to be managed solely by *innate* response, and a *flexible information system* evolves to identify and store patterns of sense and response. When an *organism* then evolves the ability to discern, store and recall aspects of its environment and itself in a *flexible information system*, to perceive patterns in this information and then to create *ordered* associations with its own behaviours, it can be said to have achieved *cognition*.

As these *organisms* evolved, they developed *language*, which is the ability to encode, transmit, receive and decode information within a flexible information system. With *language*, the complexity of information can be increased independently of the capacity and lifespan of any particular *organism*. The sharing of information through *language* benefits each individual, as its cognition is augmented by the knowledge and experiences of other individuals. However, it also benefits the whole class of *organisms* since the *collective memory* of each generation can be passed on to subsequent ones.

Continuum of Cognition



This process perpetuated *evolvable cognition*, or the potential for *cognition* to become ever more rapidly *ordered* through access to a growing *collective memory*. For humans, this *evolvable cognition* becomes the more highly ordered form that we have termed *consciousness*. In humans, *evolvable consciousness* outstrips the potential of their innate information system to influence the degree of *order* of their behaviour.

Thus far we have been speaking of the cognition of individual *organisms*. This raises the question whether in some way groups can be said to have “group cognition”. Recalling the previous definition of cognition, it seems to me that the same concept can be applied to both groups and individuals, with the only differentiation being the placement of the *analytical boundary*. Thus *group cognition* can be considered as the ability of a group to discern, store and recall aspects of its environment and itself in a *flexible information system*, to perceive

² Rowan Barrett provided valuable assistance and advice as I wrote this essay. The list of sources he suggested to me is listed in Appendix B. Barrett is a PhD candidate in Zoology and he chairs the Vancouver Evolution Group.

patterns in this information and then to create *ordered* associations with its own behaviours. However, the mechanisms by which this occurs are different for individuals and groups.

In humans this group cognition may be termed *group consciousness*. It is manifest in the pattern that results from the interactions between the behaviours computed by each individual's *consciousness*. Thus, the degree of order of a *group's consciousness* is the result of interaction of the consciousness of the individuals with it. Group consciousness is *computed* from, and derivative of that of its individuals, whereas individuals embody consciousness. Thus, *individual consciousness* can be more or less ordered than *group consciousness*, which provides a baseline and background with which individual consciousness must contend. Moreover, each individual consciousness varies with the degree of access to the *collective memory* and its will to *order* itself. *Language* is a mechanism for the development of *group consciousness*, since, in addition to transmission and reception, it allows computational operations to be performed on information within the *collective memory*.

Chapter 2: Institution and Technique as Tools of Consciousness

A central theme of Rubinoff's insights is the implosion of the institutions of agriculture as both evidence and result of the ending Age. So, this chapter will begin with a consideration of institutions and techniques as examples of *tools of consciousness*.

At some point in history, life subsisted mainly by harvesting *inorganic material*, which also includes dead organisms, from the environment. In the *harvesting mode*, organisms were limited by the quantity of *non-patterned material* in a given area.³ As the quantity of *inorganic material* became locally scarcer, some organisms evolved a strategy of capturing the food value in other organisms, or *hunting*. Amidst increasing competition, some *organisms* evolved defensive and offensive strategies, such as locomotion, shielding, camouflage and weaponry.⁴ Another strategy was for collections of individuals exhibiting complementary behaviour to form *collaborative groups*. *Collaborative groups* form when patterns of behaviour of particular individuals complement each other to enhance their collective *order*. Examples of collaborative groups can be as divergent as multi-celled organisms, or symbiosis between species. Groups of similar organisms can form collaborative groups such as flocks, packs and schools.

It is important to recognize that cooperation will evolve only if it benefits the individuals that are cooperating. Natural selection does not act on groups, but on individuals. While it may seem intuitive that selection will serve to increase the frequency of groups that cooperate, this is not how selection operates. For instance, consider a group that cooperates by hunting prey together and then sharing the food equally. This strategy may make the group better able to survive because they can capture larger prey than they would have been able to if each individual hunted alone. However, as soon as a single individual takes more than its fair share of the proceeds from the hunt, it will be fitter than the others in the group. If food is scarce, this individual will be more likely to survive than the others in the group and will contribute more offspring to the next generation. Over time, the frequency of the "cheaters" will increase and eventually they will take over the group. This may lead to the extinction of the group because without cooperation they can no longer hunt large enough prey to sustain the population. This illustrates how natural selection can sometimes doom a population even as it appears to favour the adaptive traits of particular individuals.⁵

So, collaborative groups that persist are those whose complimentary patterns of behaviour increase their collective and individual order. In other words, they have achieved adaptive success. Individual members of collaborative groups need not be aware of their complementary behaviour, as it may be innate. I will focus here on specifically human collaborative groups in which membership is defined by an awareness of a shared *pattern* of origin. For the purpose of this discussion, I will label such groups as *tribes*. I do, of course,

³ Dawkins, Richard. 'The Selfish Gene.' Oxford University Press Inc., New York, NY. 2006 edition. See page 15 chapter on replicators harvesting useful molecules that happen to be floating by in the soup surrounding the first 'replicator' molecules.

⁴ Ibid, p. 19. Dawkins discusses the development of molecules that harvest useful molecules from other organisms, and others evolving defensive strategies.

⁵ Rowan Barrett comment

recognize that other types of human collaborative groups exist, such as those with more open membership based on communities of interest or ethical bonds. However, they fall outside of the scope of this essay.

“By definition, a human tribe recognizes descent from a common ancestor. From this recognition, rules of membership are created.”⁶ – Jeffrey Rubinoff

For multi-celled organisms, the pattern of collaboration was encoded within their genes, which for the purpose of this essay is defined as the *innate information system*. With the advent of language, this collaboration may have continued its evolution by way of the *flexible information system*. The main difference for tribes is that the *rules of complementary behaviour* are located in the *flexible information system*. This made them amenable to change and rapid adaptation, thus increasing their potential *order*. When *rules of complementary behaviour* are externalized from the individuals in the group, they can be thought of as *institutions*. While institutions are created, reinforced, stored and transmitted by individuals, they function independently of particular individuals. *Institutions* function in much the same way as *collective memory*, decoupling the *rules of complementary behaviour* from efforts of *individual cognition*. This decoupling and externalization allowed institutions to increase their potential for *order*.

Moreover, *collaborative groups* are in a superior position to evolve other tools of their group consciousness. The specialization enabled by *institutions* enforcing the *rules of complementary behaviour*, encouraged the development of *technique*. *Technique* is a special kind of information that provides a degree of leverage with which the results for a given application of effort are multiplied. In human *collaborative groups*, or tribes, agriculture is one such *technique* that greatly accelerated the ordering, or adaptive, potential of consciousness.

⁶ Jeffrey Rubinoff, “Tribalism”. See <http://www.rubinoffsculpturepark.org/coi.php>

Chapter 3: The Beginning of the Age of Agriculture

Tools of human consciousness, such as *institutions* and *techniques*, are both products of and *reflexively* influence consciousness itself. At some point in history, the consciousness of collaborative groups developed tools to increase its relative *order*. Once *group consciousness* developed the requisite institutions and techniques, humans entered the Age of Agriculture. To understand what differentiates the Age of Agriculture from what as before, let us consider again the transactional modes of each.

As previously mentioned, the emergence of life is initially based on transactions between organisms and non-living matter. For this reason I have labeled the historical period in which organisms predominantly assimilated non-living matter as the Age of Harvesting. As previously stated, local, the relative scarcity of such inorganic matter necessitated a shift to the Age of Hunting, which was characterized by the assimilation of one *organism* by another. Thus we can say that in the Age of Hunting *organisms* start competing to assimilate or avoid assimilation by other organisms, and develop collaborative groups of individuals with the self-interested goal of genetic replication.⁷ It is important to note that transitions between Ages do not necessitate a wholesale change in transactional mode. For example, plants, that harvest sunlight, minerals and carbon dioxide still form an important component of an Age in which organisms hunt each other.

Changes in Ages (from a human perspective) are not defined by change in transactional modes, but by the change in the locus of potential for the growth of *consciousness*.

In the case of the Age of Agriculture, a necessary strategy was to bring certain organisms' entire existence and character under the control of *group consciousness*. This was done to ensure that a predictable quantity of *matter* would be available for local assimilation by one collaborative group. What is interesting in the case of human agriculture, is that its practice changed both the *innate information* of the cultivated organism as well as the potential for the growth of consciousness of the cultivators.

The word potential is used deliberately because it connotes a polarity, as a higher potential growth of consciousness can be manifest in increased or decreased *order*. This potential is only the accelerant with which consciousness can evolve to become more or less *ordered*. As with collaborative groups during the Age of Hunting, the *institutions* and *techniques* which evolved in the Age of Agriculture have the potential to increase *order*, and promote the success of some *collaborative groups* relative to others. However, because tools of consciousness are *reflexive* they can themselves become forces that counteract order in the computation of *group consciousness*.

⁷ Ibid Dawkins

“Security and continuity, rationalized by predictable food production, originated specialized political, civil, religious, and military institutions. Institutionalizing a warrior class was the most dangerous necessity of this social sea change. If the military were not directed outward, it would threaten the stability of the non-military institutions. Thus, a constant state of war became inevitable, and indeed the history of city-states and empires appears to confirm perpetual states of war.”⁸ – Jeffrey Rubinoff

The end of an Age is marked by the shift in the locus of potential for the further evolution of consciousness. It is the point at which the dominant transactional mode is replaced by another mode that extends the potential for further evolution of consciousness.

Moreover, just as the evolution of *innate information systems* requires a degree of spontaneous change, *evolvable consciousness* may actually require the same.

Again, it is important to recognize that the biological evolution of *innate information systems* occurs through both random and non-random processes. The fuel for evolution is random mutation, which produce variation in the population. The next step in evolution is the non-random process of natural selection, which allows adaptive variants to survive and reproduce.

Order is defined as patterns of information and behaviour that are adaptively and existentially useful from the perspective of a living organism. That means that both random and non-random processes can be ordered from the perspective of a particular species. However, it is possible that what is ordered at one time, or considering only a local scale, is or becomes disordered over an extended period or at a larger scale.

As stated, random and non-random disordering factors may also be required in the evolution of human consciousness. What this essay posits is that transitions in Ages are marked by changes of one dominant form of *order* to another within a historical boundary.

The change of an Age is thus conceptualized as the disruption a form of order by random or non-random disordering forces. After such a disruption, a new arrangement supercedes the old, giving those who master it an advantage in the development of their cognitive abilities.

⁸ Jeffrey Rubinoff, “The End of the Age of Agriculture”. See <http://www.rubinoffsculpturepark.org/coi.php>

Chapter 4: End of the Age of Agriculture

Rubinoff has called the institutionalization of the warrior class, “the most dangerous necessity,” of the Age of Agriculture. The warrior class was of course predicated by the specialization made possible by a predictable food supply.” He states that after the development of a specialized warrior class, “if the military were not directed outward, it would threaten the stability of the non-military institutions. Thus, a constant state of war became inevitable.”⁹

In the initial Company of Ideas essay, which is paraphrased below, Rubinoff surveys European history from the Renaissance to the mid-twentieth century as an example of this process. As Rubinoff outlines, in that time, Europe progressed towards scientific and technological modernity while warring endlessly along the lines of ancient and re-invented tribal rivalries. At the end of the Age of Agriculture, World War II left Europe smoldering in ruins and morally degraded by the Holocaust.

That global conflict was characterized by:

“...mass theft and murder precisely organized and recorded by collaborating modern states. The culmination of World War II was the profoundly ironic scientific ‘gift’ of nuclear weapons. As mutually assured destruction (MAD) became the ongoing policy of the nuclear-armed nations, modernity was adapted and utilized to maintain a fragile balance of terror.

Thus, the fundamental assumptions of the Age of Agriculture—security of territory as the means to secure food production—must be revised in the present era of global vulnerability. Military institutions can no longer guarantee the security of a given territory. With the advent of nuclear weapons and strategic bombing, the feasibility of escalating war has reached the level of absurdity.”¹⁰ – *Jeffrey Rubinoff*

“As nation-states recognize the potential suicide of all-out war,” Rubinoff has concluded, “the danger is that extant tribalism can continue to trigger genocide and continue the attempt to draw modernist nations into apocalyptic confrontation.”

Using Rubinoff’s insights as a point of departure, I would argue that the evolution of *techniques, institutions* and other *tools of consciousness* to the point of enabling large scale destruction represent a profound increase in *entropy*. The label *entropy* refers here to the unavailability of human energy for the development of cognition or consciousness. This reality must inform us in our consideration of the significance of the concept of the End of the Age of Agriculture.

⁹ Jeffrey Rubinoff, “The End of the Age of Agriculture”. See <http://www.rubinoffsculpturepark.org/coi.php>

¹⁰ Ibid.

Chapter 5: Question of Morality and Conscience

It is important to stress at the outset that natural selection alone cannot help us make moral decisions. A distinction must be drawn between science, which describes our observations of the world, and morality, which describes the way the world ought to be. What will be asserted is that a deeper understanding of *evolvable consciousness* is useful in making judgments about morality and conscience.

As stated in the previous chapter, Rubinoff argues that art is crucial at the End of the Age of Agriculture because of several convergent entropic forces. In turn, this essay contends that art has the potential to reinforce the *order of consciousness*. In order to understand this proposition, one must first consider how the concepts of morality and conscience factor into *evolvable consciousness*.

Recalling our previous postulation, the *order of consciousness* of a group is the result of interactions between the behaviours computed by each individual's consciousness. By order we mean the demonstrated capacity of the complimentary behaviours of individuals within a group to promote the survival and reproduction of those individuals. A necessary by-product of reproducing the individuals is also reproducing the patterns of information that lead to complimentary behaviour in the first place.

In using the word computation, we do not mean mathematical calculation, but the result of the interactions of the patterns of information contained within all individuals' consciousness. The *order of consciousness* of any particular individual is not bound by the order of the groups' consciousness, as individuals are able to choose patterns of information from the collective memory. However, this computed *order of group consciousness* becomes the backdrop from which *individual consciousness* is differentiated.

Institutionalized *rules of complementary behaviour* are a very important aspect of group consciousness. Certain rules that are considered foundational principles of individual action, and upon which an entire system of group behaviour is built, are here termed *morals*.

Stated another way, *morals* are the essential *institutional* principles for regulating individual behaviour within collaborative groups. *Morality* is a foundational behaviour pattern of *group consciousness*.

Conscience, on the other hand, is formed by principles of which the individual is aware, and by which he or she deliberately regulates his or her own behaviour. *Conscience* is determined by internal will, not by external norms. *Conscience* and *morality* may or may not overlap depending on the will of the individual.

Chapter 6: What is the Inherent Value of Art?

Within the framework of concepts that have been thus far discussed, art may be understood as the encoding and communication of highly *complex* and *ordered consciousness*. Through art a highly complex pattern of information is created in such a way as to produce in the perceiver a direct embodied experience. This does not mean that every experience of art will be the same, or that every individual will necessarily perceive it at all. It is through art that *high degrees of order* can be communicated to *individual consciousness*. Art provides a context of *human consciousness* suitable to communicating very high degrees of *order*.

So, at its best, art is capable of externalizing highly ordered consciousness. In its reflexive capability, this externalized highly ordered consciousness is the engine for the evolution of artistic consciousness itself. Once perceived, this externalized highly ordered consciousness becomes the baseline for the further evolution of the perceiver's consciousness as well.

In this way art becomes a powerful vehicle for the evolution of human consciousness.

This raises the question of what relation conscience has to art. If we recall, conscience was defined as principles of which individuals are aware and by which they deliberately regulate their own behaviour through internal will. The degree of order of *conscience* can then be thought of as the *maturity* of the individual's *conscience*. Maturity of conscience increases the greater the artist's access to the *collective memory*, because at very high levels of analysis it is hard to know what is ordered without a deep knowledge base. Because *conscience*, or, the internal principles of individual action, is the pinnacle of individual consciousness, the artistic and perceiver consciousness must recognize in each other a mutually intelligible maturity of conscience. Thus the potential of art to evolve human consciousness depends on a reasonable match between the maturity of the artistic and perceiver conscience.

Art with the highest evolutionary potential is done with the most mature state of conscience. Consequently it is only fully perceived by those with a conscience of similar maturity. As Jeffrey Rubinoff has asserted, "Art is an act of will in accord with a mature conscience".¹¹

So, we can say that art provides a way of encoding and communicating highly ordered consciousness between individuals of a similar *maturity* of *conscience*. If art is a form of communication, this raises the question of how art relates to *language* as I have defined it. Recall that language is necessary for the development of *evolvable cognition* and was defined as the ability to encode, transmit, receive and decode *flexible patterns of information*.

Here I will extend Rubinoff's insight by arguing that the difference lies in the distinction between analogy and metaphorical language. Analogical language creates abstractions that model and represent the perceived relationships of observable phenomena. When used metaphorically, language does not represent, but creates relationships, or patterns, which are themselves new phenomena. Art is metaphorical language because it does not model reality, but embodies, creates and evolves its direct perception.

¹¹ www.rubinoffsculpturepark.org – Definition of art appears at the bottom of the home page

As Rubinoff has asserts, “metaphors exist beyond logic in the realm of intuition; they are the basis for truly original thought and are by their nature unique. Metaphors are self-contained truth, and they cannot be used as analogies.”¹²

Chapter 7: The Value of Art at the End of the Age of Agriculture

Rubinoff has argued that what is required at the end of the Age of Agriculture is for metaphor and analogy to resonate together. More specifically, this means that consciousness must be developed to perceive and integrate both the metaphoric language of art and the analogical language of science. To understand this statement, let us examine each more closely within the framework of concepts developed thus far.

Science uses language as a tool of analogy in its pursuit of the limits of what can be known about the Universe. Let us recall that the definition of matter includes the as-yet unknown. The method of science is to construct analogical models to represent the perceived relationships of observable phenomena.

Jeffrey Rubinoff has explained how science pursues the knowledge of collective memory and how evolution determines what we can know of collective memory:

“The history of the universe is the collective memory of the universe. The science of cosmology probes the limits of what we can know of the collective memory. The evolution of life is the collective memory of life on our planet, and it determines what, at any point in history, we are capable of knowing of the collective memory of the universe.”¹³ – *Jeffrey Rubinoff*

Art, on the other hand, pursues the limits of what can be known about highly ordered human consciousness. The method of art is to use metaphorical “language” to encode and communicate the experience of this deep order.

As Rubinoff asserts,

“Art is the map of the human soul; each original piece is proof of the journey. As the artist navigates the unknown, the art adds to the collective memory. The artist’s journey on the path of art history takes him to the farthest reaches of his predecessor as his point of departure. The artist who follows that history then possesses the chart for evolution, which he in his turn is obliged to extend to his successors.”¹⁴ – *Jeffrey Rubinoff*

Another important distinction must be made between analogical and metaphorical language, or modeled and experienced reality. Experiences can only be embodied only in *individual*

¹² Ibid, “Evolution of Mind.” See <http://www.rubinoffsculpturepark.org/coi.php>.

¹³ Ibid, “The Importance of the History of Science. See <http://www.rubinoffsculpturepark.org/coi.php>

¹⁴ Ibid, “Importance of the History of Art”. See <http://www.rubinoffsculpturepark.org/coi.php>

consciousness. They can never exist in *group consciousness*, whereas models can exist in both *individual* and *group consciousness*.

If one accepts this, and the premise that the main goal of both art and science is to contribute to the evolution of consciousness, it follows that analogical and metaphoric language can address different aspects of its development.

It is my intuition that analogical language primarily serves to evolve the *order of morality*, the foundational principles for the rules of complementary behaviour within *group consciousness*. Since art, or metaphorical language, targets *individual consciousness*, it serves to evolve the *order of conscience*, which contains the foundational principles of action of individual consciousness.

Recalling that the *order of conscience* is termed *maturity*, the value of art then can be seen as a vehicle for increasing the maturity of human *conscience*. As Rubinoff argues, "Evolution of mind results from the dynamic engagement of truth with both analogy and metaphor."¹⁵

I would argue that survival past the End of the Age of Agriculture requires a highly ordered group consciousness. To do this, novel institutions, techniques and other tools of consciousness must be evolved.

Since *group consciousness* is derivative of and manifest in the pattern that results from the interactions between the behaviours computed as the product of *individual's consciousness*, increasing the *order of group consciousness* will require the presence of individuals of extremely highly ordered consciousness. Thus, individuals who are able to influence the order of group consciousness will be those who express their will through their conscience, the most highly ordered principles of action. As Rubinoff has argued, "art is an act of will in accord with a mature conscience."¹⁶

If artists recognize their art as an existential commitment to conscience, they may then rightly claim to constitute a force to balance science in the further evolution of consciousness.

¹⁵ Ibid, "Evolution of Mind". See <http://www.rubinoffsculpturepark.org/coi.php>

¹⁶ www.rubinoffsculpturepark.org – Definition of art appears at the bottom of the home page

BIBLIOGRAPHY

Richard Dawkins, *The God Delusion*. New York: Oxford University Press, Inc. (2006).

Jeffrey Rubinoff, *Insights*. Accessed at <http://www.rubinoffsculpturepark.org/coi.php>

Appendix I:

LIST OF SPECIAL TERMS USED IN THIS ESSAY

Age of Agriculture	A practice of collaborative groups to bring certain useful organisms' entire existence and character under conscious control thus ensuring a predictable quantity of food is available for assimilation. Especially interesting in the case of the human technique of agriculture, is that its practice changes the innate information of the cultivated organism and as well as increasing the potential for the growth of consciousness of the cultivators.
Age of Harvesting	A time at which the predominant driver of the evolution of cognition consisted of <i>organisms</i> harvesting inorganic material from the environment. In the harvesting mode, organisms were limited by the quantity of non-patterned material in a given area.
Age of Hunting	As the quantity of inorganic material became locally scarce, some organisms subsequently evolved a strategy of capturing the food value in other organisms, or hunting. Cognition was now developed further by the hunting organisms.
Analytical boundary	The boundary that is placed around a system, organization, or pattern of information for the purposes of translation into and manipulation by language.
Art	According to Jeffrey Rubinoff, an act of will in accord with a mature conscience.
Cognition	The ability to discern, store and recall aspects of the environment and oneself in a <i>flexible information system</i> , to perceive patterns in this information and then to evolve <i>ordered</i> associations with one's own behaviour.
Collaborative groups	Collections of individuals exhibiting complementary behaviour, regardless of whether they are aware of this behaviour. This can be at the micro scale of multi-celled organisms or at the macro scale with communities of symbiotic organisms.
Collective memory	Persistent evidence of past states of matter and energy. For humans it is the experiential knowledge of the individuals in each generation that can be passed on to subsequent ones through externalization using language.
Complexity	Increase in the quantity of information and interconnections within a pattern.

Conscience	Principles of which individuals are aware and by which they deliberately regulate their own behaviour through internal will. The foundational principle of action of individual consciousness, which is expressed through will, not external pressure.
Consciousness	A very highly ordered degree of cognition manifest in human beings. As with lower order cognition, human consciousness has individual and group dimensions.
End of an Age	The end of an Age is marked by the shift in the locus of potential for the further evolution of consciousness. It is the point at which the dominant transactional mode is replaced by another that extends the potential for further evolution of consciousness.
Entropy	The tendency toward ever-increasing disorder in a closed system. The reference to the Second Law of Thermodynamics, is that the amount of usable energy in a system (that which allows the concentration of patterns) will tend towards a distribution of heat energy that is no longer available for use. This is considered the degree of entropy or disorder. It is this tendency in our universe that gives direction to time. Although there are instances of subsystems that are counter-entropic (such as evolution and art) they in turn will dissipate heat into the general collective entropy. This process is observed to be irreversible. In the context of this essay it refers to unavailability of human energy for the development of cognition or consciousness
Evolution (biological)	Adaptive evolution occurs as variations that exist within the continuum of species that undergo the process of natural selection, allowing the most adaptive variants to survive and contribute offspring to succeeding generations. Evolution cannot plan for future events or anticipate what variants may be needed under new conditions.
Evolution (general)	A process whereby a pattern of information is developed over various iterations. It changes in each iteration, is influenced by its interaction with its environment of other information as well as its existentially validated value.
Evolvable cognition	The <u>potential</u> for cognition to become ever more rapidly ordered through access to a growing <i>collective memory</i>
Evolvable consciousness	The potential for human consciousness to become ever more rapidly ordered through access to a growing <i>collective memory</i> .

In humans it outstrips the potential of their innate information system to influence the degree of *order* of their behaviour.

Flexible information system	A system by which an individual <i>organism</i> can identify and store and recall sense and response information.
Group cognition	Is manifest in the pattern that results from the interactions between the behaviours computed by each individual Pattern's cognition
Individual cognition	An individual organism's ability to discern, store and recall aspects of its environment and its response in a <i>flexible information system</i> , to perceive patterns in this information and then to evolve <i>ordered</i> associations with its own responses
Innate information system	Information that the <i>organism</i> itself cannot change, but is embodied within it in a fixed manner. Defined as genes in living organisms.
Institutions	Rules of complementary behaviour within and between human collaborative groups that have been decoupled from the capacity of individuals' consciousness and lifespan.
Language	The ability to encode, transmit, receive and decode <i>flexible patterns of information</i> .
Living Organisms:	"Life is a condition that distinguishes organisms from inorganic objects, i.e. non-life, and dead organisms, being manifested by growth through metabolism, reproduction, and the power of adaptation to environment through changes originating internally. ..." en.wikipedia.org/wiki/Life
Matter	Aggregate of energy, particles and other as-yet unknown forces that seem to act in a constrained or organized relationship with each other in this universe.
Morality	Rules of complementary behaviour that are considered foundational principles for the regulation of individual action. Stated another way, morals are the essential institutional principles for regulating individual behaviour within collaborative groups. Morality is the behavioral norm of group consciousness.

Order (biological)	Organization of information that can ensure the further propagation of each particular organism within its environment, relative to other organisms attempting the same.
Order (consciousness)	<p>Highly ordered consciousness is consciousness that leads to behaviours that promote the survival and replication of the individual in which it is expressed. Because order is a future outcome, the adaptive value or order of any particular consciousness can only be accurately judged in retrospect. Order is the outcome or result, and also the form that is necessary for that state. The form of order can be a complex pattern, or a simple pattern, but ultimately what form is ordered can only be judged conclusively for specific time periods and specific entities when looking backwards in time.</p> <p>Human consciousness cannot really know whether it is ordered without knowledge of the ultimate outcomes of the behaviour that follows from that consciousness. However, humans still must act, and the only thing humans can do is act in accord with their conscience and their knowledge of analogous causal relations. The more knowledge they have the more they can attempt to understand whether their consciousness is ordered or not. However, ultimately they may never know. Order is a concept that only really applies to large time scales and to species. The conscious processes that lead to a decision whether to eat carrots not celery, work here not there, travel here not there are not on the scale that influences order. Big insights, big ideas and courageous actions, as well as the countless individuals who replicate them are the things that can influence the order of consciousness.</p>
Organisms	For the purpose of this essay, patterns of matter and information are manifested as living organisms. However, dead organisms are known to retain evidence of the Innate Information System (genetic material).
Pattern	The hypothesis that <i>matter</i> encodes the required information to form its specific arrangement as well as the mechanism to replicate itself. On Earth this is realized in the carbon molecule-based arrangement that is manifest in living Organisms.
Reflexive	Systems whose outputs recursively effects its inputs as well as the character of the system itself. For example, the tools of consciousness influence the <i>order</i> of consciousness itself.

Supernatural agency	Hypothetical forces that purport to interact with “regular” <i>matter</i> but are not bound by the organized and constrained relationships of matter in our universe.
Technique	A special kind of organized information that provides a degree of leverage through which the results for a given application of effort are both quantitatively and qualitatively increased.
Tool	Non-innate technique that is externalized or decoupled from individuals.
Tools of consciousness	Techniques and institutions are tools of consciousness. They are conceived to be externalized from individuals.
Transactional modes	Manner in which <i>patterns</i> exchange <i>matter</i> with each other and the environment
Tribes	<i>Collaborative groups</i> that consciously define a shared origin among the individual members

Appendix II: Annotated Bibliography on Sources Related to Evolution and Natural Selection Compiled by Rowan Barrett

Charles Darwin, "The Struggle for Existence", Chapter 3 in *On the Origin of the Species* (1859), pp 71-90.

This famous text introduces the concept of the struggle for existence and the universal occurrence of excess fecundity. It is an essential part of Darwin's theory of evolution by natural selection.

R.A. Fisher, "The Nature of Inheritance", Chapter 1 in *The Genetical Theory of Natural Selection*, pp 1-21

Fisher argues that Darwin's theory requires inheritance to be particulate (i.e. genes) rather than blending. It is one of the central arguments in the development of the modern synthesis.

S.J. Gould and R.C. Lewontin, Eds. *The Spandrels of San Marco and the Panglossian Paradigm* Proceedings of the Royal Society of London, B. 205, (1979), pp. 581-598.

A highly influential critique of the non-critical use of the concept of adaptation.

J.B.S. Haldane, "A Mathematical Theory of Natural and Artificial Selection". Part 1, *Transactions of the Cambridge Philosophical Society: 23* (1924), pp 19-41.

This was the first paper of the series in which Haldane made his contributions to the founding of neo-Darwinism. Of all the papers by Fisher, Wright and Haldane, this one is the clearest to most readers.

M. Kimura, "Evolutionary Rate at the Molecular Level" in *Nature: 217* ((1968), pp 624-626.

New molecular evidence had become available in the 1960s, and Kimura argued that a large proportion of genetic variation could be best explained by a theory of neutral drift.

D.L. Hartl and A.G. Clark, *Principles of Population Genetics*, 3rd edition. (1997).

An excellent textbook on basic population genetic theory.

M. Ridley, *Evolution*, 3rd edition. (2004).

An excellent basic evolutionary biology textbook.

S.J. Gould, "The Panda's Thumb" (1980).

Essays on evolution and its teaching, science biography, probabilities and common sense.