The Origins of Future Consciousness

In this chapter I describe the beginnings of future consciousness and how future consciousness has progressively evolved throughout the history of life and prehistoric humanity. I explain how the emergence and development of future consciousness was driven by survival needs and evolutionary forces and how future consciousness facilitates and further intensifies the evolutionary process. Evolution generated future consciousness, but future consciousness, expressed through culture, language, thinking, and technology, in turn has speeded up the process of evolution.

One key principle emerges in this historical – evolutionary survey. It is the principle of reciprocity. Throughout the chapter, I describe several important reciprocities relevant to the evolution of life, mind, and human society. I examine the reciprocal evolution of self and culture, genetics and culture, and male and female reproductive behavior. As a general conclusion, I argue that our evolutionary heritage and social-psychological make-up is a network of reciprocities. All these reciprocities have directly contributed to the evolution of future consciousness.

Life and the Environment

"…the entire history of life on this planet could be conceived as a striving by life-forms to attain an ever-greater appreciation of the vectors of space and time."

Leonard Shlain

Following the views of John Stewart and Leonard Shlain, among other contemporary writers, it seems that throughout the history of life temporal and spatial sensitivity has expanded from the relatively momentary here and now to increasing vistas of space and time.[1] As life became more complex, adjustment and awareness evolved to more complex and expansive patterns in the environment. Specifically following Stewart on this point, evolution has driven the growth of future consciousness because adaptability and survivability are served by increasing sensitivity and awareness of the future. The farther out in time (or for that matter in space) one can "see" the more knowledgeable and capable one becomes in dealing with the twists and turns and variations in the environment. If everything stayed the same – in every direction in space and time – there would be no need to see beyond the "here and now" – but the world is filled with differences and changes extending outward in space and time.

All life is dependent on the environment in the sense that living forms utilize, and in fact, require various resources and physical conditions in their environment in order to perpetuate their existence. In attunement with the environment, living forms possess sets of abilities that allow them to seek out,

identify, and use the resources of their world. Hence, life fits and adjusts to its environment.

The environment of life though is a complex and multifaceted reality. There is an intricate and highly organized spatial and temporal structure to the environment. The temporal structure of the environment involves various natural rhythms and periodicities, relative constancies, and often abrupt and drastic changes that occur in the world. There is a multitudinous array of animal behavior patterns within the environment. All these environmental events and temporal structures produce patterns of physical stimulation. There are complex temporal patterns of sound, pressure, and light connected with mating opportunities, food, shelter, protection, and danger.

All life shows some degree of adjustment and resonance with the temporal patterns of the environment. There are innumerable bio-rhythms built into the fabric of life - circadian, infradian (less than once a day), and ultradian (more than once a day) - which are in resonance with environmental patterns and temporal cycles.

First, let us consider the genetic foundations of environmental adaptability. From the simplest life forms, such as bacteria, which first emerged on the earth billions of years ago, all life possesses a common genetic foundation. As James Watson and Francis Crick discovered in the 1950's, the molecular code for all life on earth is embodied within the same complex molecule, DNA.[2] Differences among species are to a great degree due to variations within the DNA code. The DNA code of a particular species roughly determines a set of bodily structures and physiological, biochemical, and behavioral processes that allow the life form to successfully deal with its environment.[3] Because the genetic structure of a species is a product of natural selection due to the environment, the genetic make-up of a life form supports a set of inherited capacities that are adapted and attuned to the conditions of the environment, both its dangers and its necessities.

Although adaptability to the environment is built upon a genetic foundation, as life in its evolutionary history became more complex, other factors came into play. Multi-cellular life forms, including the first animals, dramatically appeared on the scene in great numbers and varieties during the Cambrian Explosion around 570 million years ago.[4] With the emergence of animals and complex nervous systems, distal sense organs, and muscular systems for locomotion and manipulation, perceptual and behavioral capacities were significantly enhanced. Animals can see motion, the speed and direction of the approach of predators, the receptive behavior signals of potential mates, and a host of other dynamical processes and events significant for their survival. And animals can respond with appropriate and complex behaviors to these patterns of information and environmental events. Animals show attunement in their perception and behavior with temporal patterns such as the seasons, day-night cycles, fertility rhythms, and lunar cycles.

Although the basic structure of an animal nervous system is genetically determined, this genetically endowed foundation allows for memory and anticipation based upon individual learning. Animals with nervous systems can go beyond inherited skills and capacities.[5] Through learning, existing behaviors

can be modified or new behaviors can be acquired. (The nervous system, in fact, is transformed at a synaptic and biochemical level – at the very least – in conjunction with learning.) All animals demonstrate some capacity for learning, and therefore in some sense possess the ability to remember. The less complex the nervous system, the less flexibility the animal will demonstrate to learn and modify behavior.

Adaptation to the environment based on learning has a distinct advantage over adaptation simply due to genetic inheritance.[6] Genetic variation in animals only occurs across generations due to natural selection. Learning introduces flexibility during an individual lifetime – animals can modify their behavior during their lifetime; they are not rigidly constrained by a pre-determined set of inherited dispositions and behaviors. One could of course argue that the mutability of nervous systems that are able to learn is due to a certain type of genetic make-up that supports this capacity, but the specific learned associations and responses are a result of the unique interactions with the environment during an animal's individual life.

Because animals can learn they can also anticipate. Having encountered either specific dangers or resources before in certain environmental conditions, animals learn to move in the direction of what is valuable to them, and away from what is dangerous, before they directly sense the salient object or event. They demonstrate anticipatory behavior based on past learning. It is often argued that animals live in the "immediate here and now."[7] Yet, animals clearly show responsiveness to the anticipated future and a sense of having learned from the past even if their sense of time is limited. In general, the sense of the future and the past is enriched through the effects of learning. In particular, learning introduces increased flexibility in dealing with change.

Consequently, it has been argued by biologists such as Stewart that the genetic capacity for learning and increasing flexibility would be naturally selected for in the evolution of animals.[8] More flexible animals stand a better chance of reproducing. As a general trend, as animal life has evolved, nervous systems have become more complex and animals have become increasingly flexible and capable of learning. The capacity to adjust to change has evolved through time.

The evolution of life has also been a collective process. The array of different life forms, at any given period of time, has always existed in a network of interdependencies. A critical part of the environment of life is other life forms. Life needs life in order to survive and flourish. Through both competition and cooperation life evolves collectively or reciprocally. The evolution of predators stimulates the evolution of prey and vice versa. Symbiotic and parasitic relationships continue to emerge and evolve throughout history. As Harold Morowitz states in his panoramic review of the history of evolution, *The Emergence of Everything*, new emergent forms or properties in nature co-evolve.[9]

The social and interactive dimension of life and its evolution are emphasized in Howard Bloom's writings.[10] Bloom points out that even bacteria mutually influence each other through the sharing of genetic information. Bacteria exchange DNA and can modify their physiology and behavior in response to

environmental changes through this process. As Bloom puts it, bacteria are collective learning machines.

According to Bloom, the capacity for individual learning, which emerges with animals, opens the door to a whole new mechanism for acquiring information about the past. Bloom argues that, with the development of the capacity for learning, social learning comes as well. Animals can learn through modeling and imitation of other members of their species. Members of a species can share learning and information with each other. Knowledge among animals is a social phenomenon – a group can learn and pass on information to new members. Offspring can learn from their parents or other more experienced members of their social unit. Information and learning can be passed on across multiple generations, building upon itself.[11]

In describing the evolution of humans in the next section, one significant trend that greatly contributes to the evolution of future consciousness is this ever growing capacity among our prehistoric ancestors to collectively share information and pass new learning on to offspring. The foundations of culture are built upon this ability. Culture in humans emerges, as Bloom would say, as a "collective learning machine".

The Prehistoric Evolution of Humans

"We are not fallen angels but risen apes."

William Calvin

The evolution of future consciousness in humans has been driven by adaptive challenges to life and is intimately connected to fundamental patterns of living. The development of tool making, coordinated hunting, male-female bonding, representational art, child rearing, and culture all have contributed to the expansion of human future consciousness. Much of what makes us unique, biologically, psychologically, and socially, is associated with our expanded and complex sense of time and in particular the future.[12]

In beginning the story of our ancestry it is important to keep in mind, as William Calvin notes, that "we are not fallen angels but risen apes". In spite of numerous mythic and religious stories of our having once lived in a more pure and elevated state (the Myth of the Golden Age), or the idea that humans began as non-material spirits or souls that were then placed in physical bodies, the overwhelming evidence indicates that humankind evolved through a series of stages from more primitive primates. We are evolutionarily and genetically connected with all of life (we all share DNA as a common genetic code), and in particular, we are close genetic cousins to that group of existing primates we call "apes".[13] As Desmond Morris aptly described us, we are "the naked ape".[14]

The evolutionary perspective on humans not only provides the most factually grounded explanation of our origins and nature, but also gives us a sense of hope and progression. Whatever our failings or limitations throughout

history, and there seem to be many, our evolutionary story is generally one of advancement and achievement. Our depth and range of consciousness, our capacities for science, literature, and art, our technologies, our evolution of morals and cultural values, our creative abilities, our intricate social systems, and our vast capacities for learning and the acquisition of knowledge are all evolutionary advances progressively achieved across the long trajectory of our history. To view our species as having "fallen from grace" is depressing and factually in error; to see our history as progressive is elevating and factually correct.

To begin the saga of our evolution, our genetic ancestors, the primates, appeared after the extinction of the dinosaurs approximately 60 million years ago. On the primate evolutionary line, apes and monkeys diverged around 20 million years ago. Aside from developing hands with opposable thumbs for grasping, the primate – ape evolutionary line also showed increasing behavioral plasticity, greater maternal care of young, and an increasing brain/body ratio.[15] All these general trends continued in the evolution of humans and contributed to the ongoing development of future consciousness.

Humans, chimpanzees, and gorillas all evolved or branched off of the common ancestral line of great apes. Gorillas branched off first, approximately 12 million years ago. Based on genetic evidence, the chimpanzee and human evolutionary lines diverged approximately 7 million years ago. Chimpanzee DNA is 98.6 % identical to human DNA. Chimps are our closest living genetic relatives, and humans (and not gorillas or any other ape) are the closest genetic relatives to chimps. Genetically, we cluster with the chimps. Since there are two different present species of chimpanzees, the common chimp and the bonobo chimp, we are, as Jared Diamond has argued, the "third chimpanzee".[16]

Our relationship with the common and bonobo chimps is fascinating for we seem to combine psychological and behavioral features of both species. The common chimp can be very aggressive, and the males will show extreme group violence, attacking and ferociously killing other chimps that are not part of their social group, or other vulnerable animals of prey. The bonobos exhibit much less violence and engage in a great deal of sexual behavior as a way to apparently reduce aggressive tendencies and reinforce bonding among males and females. (As animal and human research has repeatedly demonstrated, hugging and other forms of affectionate physical contact reduces violent behavior.[17]) In general, bonobos show much more intra-species affectionate behavior than do common chimps. The common chimps have a more male dominated social order whereas the bonobos are more female and maternal dominant in their social order. Interestingly, humans appear to reflect and combine both the "killer" and "lover" dispositions of our closest relatives.[18] In fact, throughout written history and theories of human nature, these two general tendencies (to fight and kill versus to love) have frequently been conceptualized as the good and evil sides of humans. As we will see, sex and violence, as well as female versus male dominance, are significant themes in the evolution of future consciousness.

One important idea regarding our ancient genetic heritage that connects sex and violence is the hypothesis that male and female humans have evolved

along different paths, the male in particular being selected for increasing violence because it increases male reproductive success. The anthropologist Michael Ghiglieri, in his book *The Dark Side of Man*, argues that hominid male evolution has been significantly shaped by sexual selection – that is the preferential selection of those behaviors that lead to securing female mates and eliminating male competition. According to Ghiglieri, it is violent behavior among males that gets selected for because it is the strongest and most intimidating males that get the female mates.[19] Hominid males learned to fight in order to make love – a rather paradoxical combination of traits to say the least. Another argument - in fact a rather popular one – connecting sex and aggression in males is the idea that our male ancestors became increasingly ferocious and effective hunters in order to win and maintain the commitment of female partners. Males killed animals of prey to get meat for females as a point of bargaining for sex and love.[20] If either or both of these hypotheses is correct, it is important to note that aggression and violence in our male human ancestors served future focused goals – sex and a committed partner.

Archeological evidence indicates that during the period of seven million to one million years ago a branching series of hominid life forms lived throughout areas of Africa and at several points migrated up into Asia and the Middle East.[21] The term “hominid” refers to all those bipedal apes that progressively emerged in the evolutionary line that separated from the chimpanzee line. Modern humans are hominids, and in fact, the only surviving member of this genetic group. In the past, often multiple hominid species co-existed in the same areas. Our ancestry is not some simple unitary line of descent, but a transforming family of various genetic cousins, a “meandering” and “multifaceted evolution”. At times our hominid predecessors lived relatively peacefully together, but at other times engaged in competition, if not violent antagonism.[22]

During the earliest period of evolutionary branching around five to four million years ago, a bipedal posture and mode of locomotion emerged, freeing the hands to carry objects (including food and baby hominids) and eventually create tools. Erect posture and locomotion probably first evolved in adaptation to the move from a jungle-forest environment to the relatively open savannah, but there is ongoing debate as to the exact reasons for the change to bipedalism.[23] The earliest erect hominids were the *Ardipethecus* and *Australopithecus* genus, of which there was a variety of species that lived throughout Africa beginning around 4.5 million years ago.[24] The famous skeleton, Lucy, is an *Australopithecus afarenis* who lived 3.2 million years ago and had a brain the size of a chimp, approximately 400 cubic centimeters.[25] Modern humans are probably descended from one of the species lines of *Australopithecus,* but many of the other lines of *Australopithecus* died out. *Australopithecus*, who lived around 2.5 million years ago, probably made the first crude tools.

Tools are most strongly associated with the appearance of *Homo habilis* (“handy man”) between 2.5 and 2 million years ago.[26] There is significant variation in the cranial size of habiline fossils, but there is an overall and quite significant trend toward increasing brain size in the habiline line. *Homo habilis* had a significantly bigger brain than *Australopithecus*. In fact, by around 1.8

million years ago hominid brain size had doubled to around 800 cubic centimeters.[27] According to Calvin, with the appearance of *Homo habilis*, meat consumption in our ancestors significantly increased (presumably to feed our bigger brain). For Peter Watson, it was the emergence of stone tools that enabled these early hominids to eat meat, providing a way to butcher animals and get at muscles and internal organs.[28]

It seems clear that the earliest stone tools were used to obtain or prepare food, both animal and vegetable. Various types of primitive tools were created through chipping and flaking particular types of stones and minerals, a process that involved both a high level of manual dexterity and thoughtful planning.[29] Chipping away at a rock to form an instrument for the intended future purpose of killing and skinning of animals, or whatever other uses these first tools served, indicates a clear awareness of the future, as well as planning for the future. A tool is made to serve a future purpose – the act of creating a tool is not an end in itself. In fact, archeological evidence seems to indicate that early hominids used tools to create other tools – chipping one stone with another – which would indicate a multiple step planning process.[30]

Another aspect of early tool making that demonstrates future consciousness is the fact that sometimes tools were made at places distant from where animals were killed or butchered. *Homo habilis* seems to have had the capacity or foresight to make tools ahead of time in one location and then bring the tools to another spot (up to ten miles away) in anticipation of finding animals and butchering them.[31]

These early stone tools were also connected with future consciousness in still another way – in this case a form of **social future consciousness**. Calvin suggests that social instincts, specifically regarding increased cooperation and sharing, evolved or developed with the emergence of *Homo habilis*.[32] These early hominid hunters, cooperatively working together to find meat, either through killing prey or scavenging, brought the meat back to the social group rather than consuming it on the spot. Further, they also appear to have engaged in cooperative butchering as is indicated by evidence at archaeological sites from the period. This securing of and then butchering meat for later consumption reflects delayed gratification and sharing. It is a social form of future oriented behavior that chimps appear totally incapable of doing.[33]

All told, these social and tool making capacities of *Homo habilis* would appear to demonstrate the ability to imagine and create mental maps. The creation of such mental images also seemed to be based on past learning; Homo habilis located and remembered places that animal prey frequented and would return to these hunting spots with tools in anticipation of finding meat for consumption.[34]

The culmination of the trend towards increasing brain size during the early tool making period was the emergence of *Homo ergaster* in Africa around 1.8 million years ago. The first hominid migration out of Africa appears to have been around 1.7 million years ago when *Homo erectus* – a slightly modified descendent of *Homo ergaster* - spread across the Middle East, Asia, and eventually as far as China and Indonesia. *Homo erectus* first learned to control

and use fire, probably cooked some foods, developed more sophisticated and standardized tools than *Homo habilis*, probably engaged in body painting, collected crystals, pebbles, and shells, presumably for aesthetics and reasons of social status, and did not become extinct, at least in Asia, till less than one hundred thousand years ago.[35]

Gaining control over fire is an especially noteworthy accomplishment for this ability clearly distinguished *Homo erectus* from the rest of the animal world. Fire was no longer something simply to fear – it became a powerful tool of future consciousness that could be used for a variety of purposes. The conquest of fire is often listed as one of the critical events in the history and evolution of humans.[36]

There are indications that *Homo erectus* was significantly more socially advanced than earlier hominids. Ghiglieri proposes, based on a review of archeological and fossil evidence, that *Homo erectus* possessed a rudimentary form of language and culture. (Fossil evidence, in fact, indicates that Broca's area – the part of the brain involved in speech production in modern humans – was even present in *Homo habilis* brains.[37]) Ghiglieri defines being human as having self-awareness and using culture as a primary means of coping with the environment. Ghiglieri believes that *Homo erectus* had these qualities.[38] Culture depends upon socially transmitted ideas from the past, and thus *Homo erectus* would therefore have developed a rudimentary form of historical consciousness. It is important to also note that, if Ghiglieri is correct, the dual dimensions of increasing self-awareness and social awareness emerged together.

It has been argued that the emergence of human consciousness depends upon the development of two defining conceptual distinctions – the abilities to distinguish the self from the non-self and the past from the future.[39] Both of these distinctions are reciprocities; the ideas of self and non-self and past and future are interdependent and defined relative to each other. It can be debated whether animals do or do not have some rudimentary sense of self and other or past and future, but if we agree with the arguments of Ghiglieri, then *Homo erectus* possessed something approximating modern human consciousness. *Homo erectus* had crossed the line separating humans and the human mind from the rest of the animal kingdom.

Ghiglieri also believes that *Homo erectus* developed monogamous female – male relationships, with the male making an extended time commitment toward the raising of children. There is debate over the point in our evolutionary history at which we developed monogamy as a primary form of male-female bonding, but monogamy does represent a significant jump forward in future consciousness in that it indicates a conscious choice against impulsive sexual gratification with multiple partners. Monogamy means commitment and commitment involves reference to the future.

Howard Bloom, who emphasizes in his book *Global Brain*, the collective and social dimensions of life, adaptation, and learning, describes the first migration of *Homo erectus* out of Africa as the collective human mind going global, spreading its primitive culture, and technology across much of the Eastern Hemisphere.[40] Various populations of hominids during this first migration and

later ones probably exchanged artifacts and inter-bred with each other. For quite some time, at least since 1.8 million years ago, we have been a burgeoning global species with varying degrees of awareness of other people and other cultures spread across other distant lands. We are creatures that form ever expanding and increasingly complex social networks.

A second significant jump in brain size occurred around 500 thousand years ago.[41] Brain size shot up another four to five hundred cubic centimeters. Connected with this second major increase in brain size is the emergence of hominids closely related to and including the first "archaic" examples of our species, *Homo sapiens*. These earliest representatives of our species first appeared in Africa.

In this most recent surge in the growth of the brain, the frontal cortex of the cerebrum at the top of the brain, in particular, expanded in size considerably. This is significant since, as revealed through modern neurological research, the prefrontal area of the frontal cortex (the large most forward section of the frontal cortex) is the part of the brain most strongly involved in future oriented decision making and purposeful behavior. The prefrontal area appears to be responsible for the temporal organization of thinking and behavior, planning and goal setting, self-initiation, and the consideration of alternative actions and consequences of behavior.[42] The frontal cortex is also strongly associated with heightened self-awareness in humans. This evolutionary surge in the growth of the frontal cortex and prefrontal area, demarcating our emergence as a species, would seem to indicate that it is our neural capacity for complex and expanded future consciousness that most strongly distinguishes our species.[43]

There are though a variety of explanations that have been offered regarding what instigated the relatively rapid growth in brain size in hominids over the entire history of the genus line during the last few million years.[44] The neurophysiologist William Calvin has hypothesized that the dramatic spurt of neurological growth in hominid evolution was triggered by sudden and frequent climate changes.[45] During the period of 2.5 million years to 500 thousand years ago there were frequent and sudden climate changes associated with the waxing and waning of innumerable Ice Ages. These climatic changes produced significant environmental changes in Africa, the home of our hominid ancestors, including decreasing rainfall and the periodic shrinking of forest and jungle. Surviving through repeated, unpredictable, and rapid change became a distinctive strength of our ancestral line – it appears that developing much bigger brains was connected with this capacity for dealing with change. As Calvin points out, tools as well as the first spurt in increasing brain size appear when the Ice Ages begin.[46]

Another explanation is that increasing brain size was connected with tool making and enhanced manual dexterity. Watson documents this theory of the evolution of the hominid brain.[47] The evolution of the brain and the development of tools occurred interdependently; increases in brain size stimulated advancements in tools which in turn triggered further increases in brain size. Within this theory, the human brain and technology form a co-evolutionary

reciprocal whole. Yet there is debate over whether evolutionary jumps in brain size are closely correlated with significant improvements in the quality of tools.[48]

A third explanation, also connected with increasing cognitive and intelligence abilities, is the "**social intelligence**" theory. More complex cooperative behaviors were needed as hunting evolved in humans. Also, as social and, in particular, family units became more complex, our hominid ancestors needed more brain power to predict and influence the behavior of one another. As hominids became increasingly complex in their social interactions and organizations, a higher level of social intelligence was needed. Hence, we have bigger brains because our complex social relationships demand high levels of intelligence.[49] In this case, society and the hominid/human brain form a positive feedback loop of reciprocal evolution.

There is another popular theory, the "**social display**" or "social mirror" theory, supported by the anthropologist Charles Whitehead and others, which proposes that increasing brain size is most strongly connected to the rapid increase in forms of gesture, personal expression, mimicking, song and dance, ritual, play, and ceremony that have emerged in our evolution. This theory does not emphasize so much the importance of increasing intelligence and cognitive capacities as it does the heightened capacity in humans to express and represent their feelings, attitudes, personality, and motives. The psychologist Merlin Donald attributes the significant advances in social organization made by *Homo erectus* to the emergence of "mimetic" thinking and behavior.[50]

Social display theory is connected with the popular sociological theory that the self is a social construction. Through display we teach each other, and in particular the young, about the nature and make-up of our psychological states. What is private is first made public. Children develop a concept of the self by being taught through display the myriad intricacies of human behavior. Children learn about emotional, motivational, attitudinal, and cognitive states of the self through having such states expressed and demonstrated by adults. The child learns to mirror the social representation of the self. We are the most self-conscious animals on the earth, and this heightened self-awareness is a product of the complex social displays we broadcast to each other and then internalize.[51]

We should recall that Ghiglieri identified culture and self-awareness as the two defining features of being human. Social display theory connects the two factors together. What I would suggest is that the self and culture constitutes a significant reciprocity in the social-psychological make-up of humans. Although social display theory may be correct in that the group teaches its youth about the nature of the human self, individuals do not all turn out the same – we are not all carbon copies of some cultural template. Our individualized selves impact back on culture, contributing new and unique elements into it. Self and culture form a reciprocal loop, each influencing the evolution of the other.

An idea from Bloom helps to understand this reciprocity of self and culture. Bloom argues that within any social group there are "**conformity enforcers**" and "**diversity generators**", providing for both cohesion and experimental variety in its repository of knowledge and behaviors.[52] These dual forces are analogous to the dual processes of genetic replication (producing uniformity) and genetic

mutation (producing variety) in biology. Culture is one of the most powerful "conformity enforcers" within human groups bringing unity of purpose and identity to a people, whereas individual selves are diversity generators, bringing experimental variety into the group. Interestingly, as revealed through archaeological evidence, as human culture evolved, more inventiveness and creativity in artifacts shows up as well. Conformity and diversity work in opposition to each other, but these processes also work in reciprocity. It is no coincidence that humans possess both highly developed cultures and highly developed individualized selves.

Another noteworthy factor to consider in understanding the reciprocal evolution of the self and culture is the development of parental care in hominid history. Increasing parental care provides more opportunity for imitation and the learning of culture and for the development of the self. Ghiglieri argues that *Homo erectus* evolved a more committed male-female bonding relationship to improve the quality of child rearing. As a general trend observed in nature, mammals more than reptiles, and in turn, primates more than other mammals, spend more time raising their offspring.[53] As our hominid line evolved, more time was spent in caring for the young. Through this process of increasing parental care, both the transmission of culture and the intensification of self-awareness were facilitated.

As one final theory to consider regarding the dramatic increase in the size of the human brain, let us return to another hypothesis of William Calvin as presented in his book *Cerebral Symphony*.[54] Calvin identifies the execution of actions in anticipation of future events, such as the throwing of projectiles toward where we believe a running animal of prey will be in the immediate future, as a key perceptual-motor capacity that evolved in humans. This is a distinctive strength of the human brain - its capacity to predict the future even if it is simply the immediate future. Literally, we are very good at "seeing ahead".

I have already discussed the general hypothesis that what clearly distinguishes humans from other animals is our highly developed capacity for future consciousness. What I would like to introduce now is the neurological theory that the human brain is fundamentally a mechanism for making continual predictions about the future. As argued by writers such as Daniel Dennett and Jeff Hawkins, the human brain is continually generating predictions about what is going to happen in the future, from the short term to the long term. For Hawkins, human intelligence is nothing but the skill in making predictions. Although throughout the history of psychology, it has been emphasized that what distinguishes humans is our capacity for learning and memory – as great recorders of the past – the view being described here takes the opposite approach; what distinguishes the human brain is the highly developed capacity to predict. In fact, to drive the point home, if we consider the evolution of brains in animals, it is clearly more important that animals anticipate what is going to happen than to remember what has happened in the past. If we examine the neurological circuitry of the animal or human brain, sensory nerves do not simply convey information from sense organs to the brain, but rather, the brain, through numerous neural pathways running down the sensory nerves and the motor

nerves that control adjustments in the sense organs, modulate sensory input; even basic perception and behavior is a forward looking process. Brains search and explore in anticipation of what is going to happen.[55] Hence, for whatever reasons that it became increasingly important, the recent surge in the evolution of the human brain involved a dramatic growth in the basic neural capacity for anticipating or predicting the future.

Whatever the reasons for increasing brain size, and there were probably several based on both archeological and genetic evidence, our modern species, *Homo Sapiens*, appeared first in Africa around 150,000 years ago.[56] The brains and body structure of these humans were basically identical to those of modern humans (but see below for a possible noteworthy difference).

After migrating into the Middle East, Asia, and eventually Europe, they co-existed for quite sometime with their genetic cousins, *Homo neanderthalenis*. Neanderthals were shorter and more solidly built than *Homo sapiens* and actually had a slightly bigger brain.[57] What is particularly fascinating is that archeological evidence indicates very little difference in tools and artifacts in their early years of co-existence between these two related species.

Neanderthals and modern *Homo sapiens* are probably related through a common ancestor, *Homo heidelbergensis (or archaic Homo sapiens)*, that lived throughout Africa and Eurasia approximately four hundred thousand years ago.[58] Neanderthals lived in Europe and Western Asia and appear to have been specially adapted to the rigors and climatic challenges of the Ice Ages. They were probably predominately meat eaters, made sustained hunting treks with both children and females, buried their dead, skinned animals for clothing, and had some level of spoken language, but did not show much variation or change in their material culture, referred to as the Mousterian culture, for most of the time of their existence from three hundred to twenty-eight thousand years ago.[59] Yet during the last ten thousand years of their existence they began to exhibit real advances in material culture, including representational art, after apparent contact with modern *Homo sapiens* in Western Europe, thus producing what is referred to as the distinctive Châtelperronian culture. But contact with *Homo sapiens* was probably the eventual undoing of the Neanderthals for chances are that they were out-competed by the superior culture and way of life of *Homo sapiens*.[60]

The demise of the Neanderthals was connected with something of great importance that happened in human history around forty thousand years ago. As noted above, *Homo sapiens* first appear around one hundred and fifty thousand years ago in Africa. Our species spread up into the Middle East sometime after that time, but did not distinguish itself in any significant way from the Neanderthals who also lived in that region. Our brains and bodies were basically the same as today, but we showed no indication of real material or technological superiority. Following Diamond, even if he is somewhat exaggerating the point, we were still more animal than human at least in our behavior and accomplishments.[61] Yet based on the most recent thinking on this matter, sometime around fifty thousand years ago, a relatively small group of genetically linked *Homo sapiens* came out of Africa carrying with them a distinctly different

and highly more advanced material culture. This group of *Homo sapiens* first spread across Eurasia and then Australia, and eventually the entire globe, wiping out all other existing hominids in their way, as well as driving to extinction many Ice Age mammals due to their highly efficient hunting techniques and weaponry. This relatively sudden and momentous advance in culture, abilities, and behavior is referred to as "**The Great Awakening**" or "The Great Leap Forward", or as William Calvin calls it, "The Mind's Big Bang".[62]

The Great Awakening, Culture, and the Discovery of Death

"In the beginning was the image"

Leonard Shlain

Whereas prior to forty to fifty thousand years ago, *Homo sapiens* demonstrated little inventiveness in tools, worked with limited and local materials and resources, showed minimal variation in artifacts across different regions, and few examples of representational art – most artifacts were utilitarian – beginning with the Aurignacian cultural period in Western Europe (40,000 to 28,000 BP) things dramatically changed. Cave paintings, engravings, sculptures, body adornments, musical instruments, new multi-pieced weapons, ceramics, and weaving appeared in great variety and numbers. Also, long distance trading of materials and unique local cultures emerged. Further, cultural evolution went into high gear, with new distinctive cultures developing in relatively quick succession to each other. The Late Stone Age or Upper Paleolithic Age (40,000 to 11,000 BP) witnessed an explosion in human inventiveness.[63]

There are a variety of explanations for what instigated this acceleration in creativity and change. The emergence of modern language, the rise of patriarchy, and the psychological discovery of personal death have all been proposed as instigators of the Great Awakening. It has also been argued that the Great Awakening is more apparent than real. Throughout Africa, prior to the Great Awakening, there is piecemeal evidence for most of the significant advances connected with Aurignacian culture. When the final wave of migration of modern humans came out of Africa around 50,000 years ago they brought with them all the elements of Aurignacian culture that had been more slowly acquired over the previous one to two hundred thousand years.[64]

Randall White, the historian of prehistoric art, takes the view, however, that at least regarding the multifarious forms of art that emerged in Western Europe around 40,000 years ago, the cultural jump was relatively sudden and pronounced. Further, he makes the basic evolutionary point that representational art must have had a significant adaptive benefit. He suggests that perhaps its emergence was connected with contact and competition with the Neanderthals, though it should be recalled that Neanderthals and *Homo sapiens* coexisted for approximately one hundred thousand years prior to the Great Awakening.

But to follow White's argument that art had some important adaptive value, he points out that representational art provided a new medium or "space" in which to abstract or isolate features of the natural world and re-present these features where they could be rearranged and combined in new ways. That is, representational art provided a public and material "mental working space" in which to think in terms of images, icons, and symbols. This medium or new virtual reality, in which to represent information, possessed much more flexibility and openness than the natural world. For example, there are art objects and drawings that are "**therianthropic**", where animals and humans are combined into single figures. Sequential time and motion are also represented through drawings of horses or other animals in successive body positions. Part of a whole complete object in the natural world could be separated and abstracted from the whole and represented as standing for the whole (referred to as "metonymy"). Representational art, by producing this vastly enlarged mental space in which to think, would have provided our ancestors with much greater cognitive power than that of any co-existing hominids, or for that matter, of any other animals who "think" only within the confines of the perceptual world. Art opened up a new universe of possibilities.

It is interesting that this development of a mental space for abstract, combinational, and possibility thinking parallels a similar process that presumably took place, according to social display theory, in the evolution of the self; in both cases a mental reality was initially expressed and developed in public. Over time, the public realm and private mental realm have intertwined into a reciprocal feedback loop, with inner realities manifesting outer expressions and outer expressions instigating further developments in inner realities. We draw and we write to "see" what we think and what we can imagine, but in turn, what we think and imagine provides stimulation and instigation for what we express within the public world. The arguments from White and Whitehead are that the public arena first instigated developments in the inner mental reality. In our present time, the development of computers, which provides a further enhancement of a public space in which to think and imagine, is probably instigating a new level of development in our inner mental capacities and reality.

The idea that representational art provided a new medium or space in which to think connects with an important argument presented by William Calvin regarding our cognitive evolution. Modern human thought, and its expressions through language, music, mathematics, and art, possesses complex and contextualized structure. Our thoughts are frequently not single ideas, but organized arrangements of ideas exhibiting various internal relationships and references. Language possesses syntax and grammar which provides a structure for the arrangement of words, logic identifies rules of implication and reasoning, planning involves the arrangement of steps in sequential order, narration places events in temporal and causal sequences, and musical composition involves a host of principles for harmony and development. Modern humans think in complex Gestalts – in particular, possessing sequential order and relationships.

Sometime in our evolution this capacity to operate in complex mental spaces, involving framing, nesting, and arranging of ideas within ideas developed. Although Calvin does not give precise dates, since it is extremely difficult at this point in time to precisely determine the details of what was going on or not going on in our ancestors' minds, he does suggest that complex human thought emerged just before or coincident with the Great Awakening.[65]

If representational art provided a medium in which to juxtapose, arrange, abstract, and recombine features of the external world, then it very well could have supplied the "mental space" in which to develop complex and modern thought. It was the medium that created the new message.

Another converging line of thinking on this cognitive jump concerns human language. To recall, Ghiglieri contends that *Homo erectus* had some level of language capacity, and White clearly believes that Neanderthals possessed language. Yet, according to Diamond, it was the emergence of modern language with complex syntax that instigated the Great Awakening.[66] Language is of course a prime example of a structured, contextualized, and rule governed capacity.

Other writers, such as Reading, also see the emergence of language as responsible for the Great Awakening. Reading believes that language provides a symbolic system for representing reality that allows humans to transcend the here and now and engage in abstract and hypothetical thinking. Further, it supports the complex sequential pattern of human thinking.[67] Language is the foundation for human future consciousness. Others have in fact made the argument that the emergence of language during the Great Awakening is what led to the emergence of representational art.[68]

I think that Calvin is on the mark though in arguing that what is fundamental is the complex form of thinking that appears in modern humans. Language is one example of this evolved cognitive capacity, but then so is representational art. Archeological evidence would indicate that music, another form of complex sequential behavior, may have emerged around the same time. Perhaps all these types of behaviors appeared relatively close together because of a general cognitive jump in the capacity to represent and organize "ideas" in complex arrangements.

The significance White places on representational art is that it is relatively permanent and publicly visible – providing a "tablet" to "read" from and a "canvas" on which to tinker, embellish, and create. It has even been hypothesized that cave art, along with other artifacts, was a "tribal encyclopedia" which recorded important information that members of a tribe needed to learn in order to function in the world. Hence, although language is usually cited as the one symbolic system that allows humans to plan out sequences of behavior ahead of time, there is evidence to support the idea that representational art also served the function of not only recording significant events and ideas but developing plans for the future as well.[69]

Complex thought, and its manifestations in art, music, and language provides a possibility space in which the mind can work. It is structured and anchored in symbols, images, and rules, but it opens up an arena of mental

freedom. After the Great Awakening, humans became much more creative, rather than stuck in traditional or repetitive ways of life that lasted for tens and hundreds of thousands of years. As I mentioned earlier, perceptual consciousness involves a contextual structure for experiencing the flow of time and the organization of space. Complex thought provided a mental structure in which to represent time, as well as other aspects of reality, in a more powerful and expansive way than through the more primitive processes of perception and emotion.

Prehistoric representational art was connected with the development of cognition and consciousness, but what were the motives or reasons behind creating it? As noted above, it may have served the functions of record keeping and representing plans, but there are other explanations that have been offered as well. Two popular and related explanations are that 1) the art objects were totems embodying or representing spiritual or animal powers or 2) that the art served the function of sympathetic magic; by drawing animals this would bring success in hunting the animals. The latter explanation is clearly an example of future consciousness – the drawing presumably causes a future event to occur. But the paintings and drawings do not correspond very well with the animals that were hunted by the people who created the art, and very rarely are there explicit depictions of animals actually being hunted. A third, recently popular explanation is that the art was an expression of **shamanism** – the paintings or sculptures provided access to and perhaps power over a spiritual world.

White believes that prehistoric art probably served many purposes, including all of those listed above. As another function, jewelry and body adornment probably signified social status. Of special significance to the evolution of temporal consciousness, it has been noted in recent studies of cave paintings that the art on the walls does not appear to be random but arranged into coherent wholes. The different drawings and engravings fit together. It has been suggested that the collection of art in a particular cave form "**mythograms**", that is, stories told in pictures.[70] This is highly significant for it implies that prehistoric humans were representing temporal sequences or narratives tens of thousands of years ago, and interestingly in the form of images. Again, the medium provided a mental space in which to organize and articulate a complex structure of thought – in this case the story – a temporal structure. Our first recorded stories, and perhaps myths, were "picture books". The image and the corresponding human capacity to imagine and visualize has been a powerful dimension within temporal consciousness throughout the existence of our species. In fact, it may be critical to our unique and advanced mental abilities. It may have begun on the walls of caves.

Prehistoric art and cultural periods evolved and transformed during the Upper Paleolithic Age. The Aurignacian period was followed by the Gravettian period (28,000 to 22, 000 BP) in Western Europe. During the Gravettian period there was a large increase in human representations and musical instruments, and new materials and techniques emerged. An utterly fantastic and compelling polished ivory sculpture of the bust of a woman (the "hooded lady") was produced during this time and the woman clearly was not in the same style as

the numerous “Venus” sculptures that were to follow in the next period.[71] The Gravettian period, in turn, was followed by the Solutrean period (22,000 to 18,000 BP), and then the Magdalenian period (18,000 to 11,000 BP). In each case there was a significant cultural transformation, with new materials, new motifs, new styles, and new types of objects appearing on the scene.

More art and artifacts have been uncovered from the Magdalenian period than all other periods combined. Although there are some examples dated from the Gravettian period, a profusion of “Venus” (fertility) sculptures appeared during Magdalenian period. Though there is debate on this point, these Venus figurines appear to highlight the sexual features of women and it has been argued that these sculptures reflect a mother Goddess religion that dates back tens of thousands of years. The woman was worshipped as the source and giver of new life.[72] Also, although abstract and geometrical designs have been found in earlier periods, even predating the Great Awakening, but there was a huge increase in visual abstraction during the Magdalenian period. White argues that such designs and symbols must have had cultural meaning and rules behind their use and placing – they were not “gratuitous decorations.” The problem, of course, is that there is no reliable way, as of yet, to understand their meaning. Still, between such abstract designs and pictorial mythograms, it seems highly probable that humans were creating a record of their ideas and observations long before the official beginning of written language and recorded history. Watson in fact suggests that Paleolithic art should be viewed as a form of writing. It is clear then that written language did not appear all at once around 4000 BC with the Sumerians, but has its antecedents in the designs and art of the late Stone Age. As of yet, we simply do not know how to read these messages from our deep past.

The Great Awakening marked a relatively abrupt change in the history of human evolution. Hominid history had already experienced several important earlier “evolutionary jumps”. The first of these was when our ancestors moved out from the jungle and became erect; the second and third were the relatively quick and substantial increases in brain size, initially around two million years ago and more recently around 500 thousand years ago. Coincident with these anatomical and biological changes there were certainly significant cultural, behavioral, and psychological changes as well. The pattern of human evolutionary change that emerges is not so much a steady smooth advance, but rather relatively sudden evolutionary spurts followed by periods of relative stability.

In the 1970’s, the biologists Niles Eldredge and Stephen Jay Gould proposed the theory of “**punctuated equilibria**” which described evolutionary change in terms of this idea of extended periods of stability or equilibrium followed or “punctuated” by relatively short, abrupt, and significant changes.[73] The theory of punctuated equilibria seems to apply to human evolution. Although there were various antecedents and building blocks being put into place prior to the Great Awakening, it is noteworthy how relatively recent, sudden, and dramatic was the appearance of the modern human mind and human culture.[74]

Based on this idea that historical change exhibits a pattern of sudden dramatic spurts, it is frequently argued that there have been three distinctive and fundamental cultural revolutions in the history of humanity – the Agricultural, the Industrial, and the Informational.[75] Each of these revolutions was a jump forward that transformed all of human life. Yet, I would suggest that the Great Awakening should be included as a fourth fundamental cultural revolution – in fact, the founding revolution that truly created our modern species.

The Great Awakening appears to be primarily a mental, cultural, and technological jump rather than a biological jump. *Homo sapiens* seems to have had basically the same sized brain for at least hundred thousand years prior to the Great Awakening. What changed was what humans did with their brains.

It is a common belief that the emergence of culture represents an advance in the evolutionary process.[76] Cultural change can move much faster than biological change in that whatever is learned in a generation can be passed on to the next generation through education and the training of the young. Cultural change is purposeful and new ideas and technologies can be rapidly disseminated throughout a whole population. Genetic change only occurs once each generation at the time of conception. Genetic change appears to be based on random trial and error and requires many generations for new biological transformations to spread throughout a population. Ghiglieri argues that it was development of culture that gave humans a tremendous edge over other animals, both prey and competing predators. According to him, we became the most advanced and most dangerous animals with the evolution of culture.

Calvin sees culture as providing a new way to enhance the capabilities and the evolution of the mind.[77] Culture offers ideas, techniques, thinking principles, values, and conceptual schemes that the mind can learn to boost its abilities in dealing with the environment. Culture amplifies the powers of the mind.

Culture is not only a “tool” of the mind, but an environmental “space” in which the human mind must work. Human minds must be able to deal with the rules and values of culture. Culture has become a critical part of the human environment, at least as important as the natural environment.

I have already introduced the hypothesis that the human self and culture reciprocally evolved. Broadening this hypothesis, the total make-up of the human mind, which includes the self, as well as supporting cognitive, motivational, emotional, perceptual, and behavioral capacities, co-evolved with human culture. Humans born into the world of culture must learn its structure of rules and values in order to function and survive within it, but in turn, it is human minds that contribute new ideas, technologies, and values into the growing body of culture.

But it is not just mind and culture that reciprocally evolve; culture and genes intertwine, and co-evolve. For approximately the last 40,000 years, if not longer, the necessities and requirements of living in a cultured world have probably been a significant selecting mechanism on our genetic evolution. Humans that have been genetically selected are those that best survive, replicate, and flourish in a world of culture. Culture influences genetics, providing

the environment in which continued genetic evolution occurs. Different genetic combinations compete with each other in the environment of culture.

Recent scientific evidence lends support to this idea that the growth of culture has had an influence on the genetic structure of humans. Although, as noted above, Homo sapiens during the Great Awakening appear basically the same anatomically as contemporary humans, detailed genetic research in two different studies has revealed some rather significant genetic differences between modern humans and *Homo sapiens* of 50,000 years ago. It may be that approximately seven percent of human genes have been altered over the last 50,000 years. The argument, presented by the geneticists who recently made this discovery, is that the cultural environment of humans has been selecting certain genetic types as most compatible with the special demands of civilization. If these experimental results are further validated, then although the gross anatomy of the human brain may not have changed much since the Great Awakening, there are probably some important changes in the human brain that so far have gone unnoticed.[78]

There is the reverse argument from the discipline of sociobiology that human culture is a reflection and creation of our unique genetic make-up; that is, culture is in our genes.[79] Since culture provides a powerful mechanism for improving the capacity for humans to compete and survive within nature, hominids with genes that pre-disposed them to assimilate cultural principles were naturally selected for. Many of the basic features of culture, including cooperation, altruism, symbolization, and general principles of language appear built into us genetically. In fact, there may be hundreds of human "cultural universals" that are genetically inherited.[80].

Culture and genes therefore appear to form a reciprocity, each variable driving the further evolution of the other. It is not just simply that the individual psychological development of a child is an interaction effect of culture and genes – of nurture and nature – but nature and nurture intrinsically reflect the influence of each other. There is no pure nature or pure nurture – nature and nurture interpenetrate. Our nature (our genes) has been selected for and influenced by culture, and our ways of nurturing (our culture) is a reflection of our genes. Culture is in our genes and genes are in our culture. The interactive and interdependent evolution of genes and culture is a clear and highly significant example of reciprocal evolution in humans.

Another concept demonstrating how reciprocal evolution has operated within the history of humanity is "**The Red Queen Principle**." Based on an idea taken from Lewis Carroll's *Alice in Wonderland*, Calvin uses this principle to describe the dynamics of human evolution. In Carroll's story the Queen of Hearts explains the principle to Alice. Imagine being on a treadmill that keeps moving faster and faster. In order to just stay in the same place, a person would have to walk faster and faster. If a person walked at the same pace, they would go backwards since the treadmill is accelerating. Calvin suggests that our history shows clear examples of the Red Queen Principle. As we became more adept hunters, the animals we hunted adapted to our predatory behaviors and became more elusive and quick in avoiding us. Hence, we were pushed into having to

become even more adept at hunting just to stay even. Predator and prey reciprocally evolve, each advance in one causing the other to move forward as well. Although Ghiglieri does not use the expression “Red Queen,” he provides another example of its operation in discussing intra and inter-group competition among males. Hominid males within a group competed against each other for females (sexual selection) and different hunting groups of males competed against each other for food. In both cases, males are continually forced into innovation and further development because their competitors – other males – are doing the same thing to get ahead as well. Ghiglieri thinks that the evolution of male intelligence and aggressiveness was fueled by males having to compete against each other for sex and food. In general, competition can lead to reciprocal evolution due to the Red Queen Principle.[81]

The science fiction writer Greg Bear provides a fascinating illustration of the Red Queen principle applied to genes and culture in his novels *Darwin’s Radio* and *Darwin’s Children*.[82] Bear speculates that the last big genetic jump in human evolution - that is the emergence of our species - was provoked by environmental stress, and that given our increasingly demanding and stressful present culture, a new genetic jump could soon occur in the human line. Genes, from a sociobiological perspective, generate culture, but then culture surges forward due to innovation and social learning eventually putting adaptive stress on the human population that created the culture.

In considering the significance of culture in human evolution, an important general trend in our history becomes very noticeable. Human evolution appears to be accelerating. In early hominid history, physical and behavioral changes (as for example evidenced in tool making) moved relatively slowly. It took approximately two million years for hominid brain capacity to significantly increase above the level of chimpanzees after our ancestors became erect. The earliest tools did not change much during the period of *Australopithecus* and *Homo habilis*, and then with the appearance of *Homo erectus* and new tools and behaviors there was not a significant amount of change for another million years. The next burst in evolution began around 500 thousand years ago, with increasing brain size and a variety of new innovations throughout Africa over the next few hundred thousand years. But the power of cultural evolution, which had been slowly building, eventually reached a critical threshold and around 50 thousand years ago accelerated further developments, producing a succession of new and distinct cultures which appeared approximately every ten thousand years. Subsequent changes, as we move from prehistory to agriculture, to the emergence of cities and empires, modernization, the Scientific Revolution, industrialization, globalization, and the Information Age, come increasingly more quickly. Human evolution may occur in bursts, but the bursts are getting closer and closer together.

As I noted in the opening chapter, it is a common view among contemporary writers that things are moving faster and faster.[83] This accelerative process extends back to the beginnings of human evolution. One way of explaining this accelerative trend is that the rate at which information is being created, stored, processed, and disseminated by humans is increasing.[84]

Evolution is speeding up because information processing is speeding up. The emergence and growth of culture has greatly facilitated this acceleration of information and information processing. Tools, self-reflection, language, art, and increasing trade and exchange, all creations of human culture, speed up the evolutionary process and the growth of information. As Barbara Marx Hubbard states, these new components are "design innovations" in the evolutionary process.[85] These innovations are expressions and creations of evolution, but in turn enrich the evolutionary process and amplify the rate of evolution in a reciprocal loop.[86] The emergence of humans and subsequently human culture facilitated the "evolution of evolution."

One final important theme regarding early cultural evolution and the Great Awakening is humanity's realization of personal mortality. Explanations for the Great Awakening include competition with Neanderthals, the development of modern language, and the emergence of complex thought, but it has also been proposed by different writers that it was the discovery of death that lit the fire of cultural evolution. No other existing animal species indicates in their behavior any understanding that someday they individually will die.[87] Understanding personal death entails an extended view of one's future and a clear level of self-awareness – "I am going to die." Although the first undisputed examples of the burial of the dead extend back 100,000 years (for whatever reasons it was done), archeological evidence indicates that coincident with the Great Awakening there is unequivocal evidence that *Homo sapiens* and Neanderthals buried their dead with various artifacts placed in the graves, which would seem to reflect a belief in an afterlife.[88] A salient development in future consciousness – the realization of personal mortality combined with a belief in a hereafter - would then be at least partly responsible for the emergence of human culture.

Leonard Shlain believes that women first clearly realized the inevitability of personal death and that women accepted it better than men. According to Shlain, men seem to fear it more. Further, as others have also argued, Shlain thinks that the burying of the dead with beads, flowers, and various other artifacts implied that humans concluded that we didn't really die but somehow continued to exist. Hence, Shlain connects the burying of the dead with self-delusion based on fear and superstition. He states that men predominately invented mythical places after death to assuage their fear of death.

Shlain also thinks that humans developed art to create something to be remembered – to achieve some immortality – in the face of the conscious realization that life is transient and finite. Humans search for purpose and meaning, according to Shlain, because of the realization of death. He states that these early works of art were both self-satisfying and intended to be recognized by others. As early humans, we wanted to be remembered as unique individuals and from this we derived a sense of immortality. One meaning of the drawings on the walls of caves may simply be "Here I was – remember me."

Echoing similar themes, the philosopher of time J. T. Fraser states that humans find death "unacceptable" at a deep emotional level and all of the great creations of human culture, including art, religion, philosophy, and science, are attempts to combat the passage and end of personal time. All these high cultural

achievements are efforts to discover or create permanence in a universe, which according to Fraser, is fundamentally one of unrest and flux. For Fraser, the "discovery of death" depended upon humans developing an extended sense of past and future. This expansion in temporal consciousness brought a great survival advantage to our ancestors, but at a price. Because we could see ahead, we had the capacity to plan, and thus emerged the realization of personal responsibility for our lives. But in realizing that we were responsible for our lives and that someday we would die, we lost our sense of peace.[89]

Hence, understanding personal death is not simply a cognitive insight about the future, it is a highly charged emotional experience regarding the personal future as well. We feel it – we are often terrified by it. The cultural anthropologist, Ernest Becker, in his Pulitzer Prize winning book, *The Denial of Death*, argues that personal death is humankind's most powerful fear and motivates a great deal of human activity and creation.[90] This psychological thesis obviously reinforces the views of Shlain and Fraser.

Fraser pays particular attention to myth and religion, the topic of the next chapter, as an early expression of denying death and the passage of time. The emergence of religion brought with it the promise of an after-life**,** a future beyond the death of the body. Almost all major world religions contain the idea of life after death, and numerous mythic tales describe the resurrection of both humans and various deities. Undoubtedly there are other contributing factors to the development of religion, but clearly one of the most important ones has been trying to find a palatable answer to our personal futures in the face of the incontrovertible insight that someday we will die. Perhaps this is a way to pacify the anguish and fear of the human soul, but following this line of reasoning, religion, one of the most powerful achievements of human culture, clearly emerges in the conscious realization of a fundamental fact about our personal futures.

Sex, Love, and Aggression – Women, Men, and Children

"Adam confronted a knotty problem no other male of any other species ever had to contend with – a female with a mind of her own"

Leonard Shlain

At this point in my survey of prehistory, I am shifting focus from the evolution of humans in general to the distinctive features of male and female evolution, in particular the unique qualities of male and female psychology and the reproductive challenges and strategies of the two sexes. It is also important to examine the evolving relationship between men and women. Our evolution is a co-evolution - a reciprocal evolution – of men and women – of two intertwining psychologies. The respective psychologies of the two sexes show up in our first myths and the two main theories of time that emerged in the prehistoric world.

Our sense of the future is intimately connected with our dual sexuality as a species.

As argued throughout this chapter, it is important to look at the connection between biology, survival needs, and basic psychological and social activities to understand the evolution of future consciousness. Two of the most powerful biologically based human motives are sex and aggression, and both of these motives have played a significant role in the evolution of future consciousness. Leonard Shlain, in his book *Time, Sex, and Power*, presents an evolutionary explanation of the emergence of future consciousness based on a set of fundamental changes in reproduction, sex, male-female relationships, and hunting behavior which, according to him, took place in the last hundred and fifty thousand years.[91] Shlain argues that the Great Awakening was intimately connected to an evolutionary change in how we engaged in sex and bonded together, and the role hunting played in this process.

According to Shlain, the evolution of increasingly larger heads in our hominid line, coupled with our developing bipedalism and the resulting constriction of the birth canal, put great physiological stress on women in childbirth. The evolutionary "solution" to this problem was toward increasingly premature births, producing progressively more immature offspring. Because children were born increasingly premature, mothers needed to focus more on childcare for longer periods of time as our genetic line evolved.

On a related note, Diamond argues that as our food gathering culture evolved, which involved more sophisticated tools and behaviors, more time was needed to teach children the survival skills of human life. Children were less capable and more dependent and needed to learn more to be successful adults. Culture played a bigger role.[92] Again, the general point, now from a cultural and social learning perspective, is that, as humans evolved, children became more dependent and required more attention in their upbringing.

Shlain argues that as a result of increasing childcare demands, mothers needed more dependable, responsible, and committed male mates to supply security, food, and stability while they were busy tending to the children. Yet from a reproductive perspective, men are naturally motivated to engage in intercourse with as many different women as possible in order to maximize the number of potential offspring. Once a male impregnates a female, he can move on to another female and reproduce again. Further, male primates, in comparison with females, generally do not spend much time tending to childcare. In essence, although our female ancestors needed committed and attentive males, human males by nature and genetic heritage are polygamous and want to wander from the nest. Hence, how do you get the male to stay at home? The answer, according to Shlain, was sex.

One of the most unusual biological features of female humans is **cryptic** (or concealed) **ovulation**. Whereas other female primates and mammals exhibit estrus, a state of fertility with distinct and visible physical and behavioral symptoms, for human females there are no clear outward signs of fertility. Why would human females develop cryptic ovulation, since it does not seem to serve the function of maximizing the chances of reproduction during sex? According to

Shlain, cryptic ovulation increases the time spent in sex and facilitates the development of committed males. The male must stick around and engage in sex more frequently with the same female since he doesn't know when the female is fertile.

Humans seem to be more invested mentally and behaviorally in sex than any other species. Testosterone levels are fairly steady and high in human adult males with a noticeable and dramatic peak during adolescence. Shlain argues, in fact, that adult human males are in a constant state of sexual arousal. Hence human males will have sex with a woman regardless of whether she is fertile or not. For her part, the human female is potentially receptive all the time, not only during her fertile period. Generally speaking, humans have sex anytime and anyplace, though not necessarily with anybody.

As Diamond notes, since most human sex does not directly connect to reproduction, it must serve some other important function. The answer that Shlain, Diamond, and others have presented is that it facilitates male – female bonding. For Shlain, not only does sex serve as a way to express and reinforce affection between the male and female, it provides a negotiation tool for solidifying long term bonding and commitment.

Although humans engage in sex on a frequent and continuous basis, with the female need for long term commitment from the male, sex moved beyond a simple impulsive act. The woman needed a mate who would not only impregnate her but stick by her. The male had to convince the woman that he would stay with her and provide protection, food, and parental care in exchange for regular sex. Consequently, according to Shlain, humans began to engage in sex with forethought; considerations regarding the future became an essential prelude to the act of sex. Sex became a negotiation between the female and the male and language became an important tool in this process. Where men used it as a tool of persuasion, women, after considering the implications of engaging in sex with a particular male and assessing his potential as a partner, used language to question, interrogate, and respond. The ancient Hebrew story of *Lilith*, the first wife of Adam, who would not bend to Adam's will is a reflection of this new relationship of male and female. The female was no longer automatically compliant.[93]

This negotiation holds special significance in regard to the evolution of future consciousness. Shlain argues that a basic exchange developed between women and men – the exchange of meat and iron for sex. Female humans lose a good deal of iron during their excessively heavy menstrual period and meat is one primary source of iron. Although it is traditionally the prehistoric male who is credited as the hunter and meat eater, according to Shlain, it was the female who drove the need for hunting meat. The woman needs meat *to replenish her level of iron* and the male provides it for the woman as part of the bargain for sex. As Shlain points out there is no other animal that trades meat for sex. As I noted earlier, there is evidence running back millions of years that hominids could delay immediate hunger gratification. Thus, it is not the appeasement of hunger men kill for but sex. Shlain's argument is a further elaboration on this significant point of human psychology and the evolution of future consciousness. Male hunters,

instead of consuming meat from prey immediately, brought the meat back to the female in order to ensure (for the future) continued sex. Hunting, sex, and the eating of meat are interconnected and all highly future-oriented behaviors.

Shlain believes that males have had to adapt to a variety of changes that occurred in human females since the emergence of our species. He asserts that for the last 150,000 years men have been attempting to regain power lost to females. The male evolved more adept brains and higher forms of cognition to deal with the question of what he must do to convince the female to have sex with him. Males became what women wanted them to be. These changes in the male involved the capacity for enduring delayed gratification in both food and sex and achieving long term stability patterns in behavior, that is, monogamy. Yet this evolutionary change was a reciprocal trade-off. Monogamy gave the woman security and food, but made her dependent on the male. Further, through the process of sexual selection, females undoubtedly evolved a set of sexually desirable traits for the male. If the male is what the woman wants, the woman is what the male wants.

According to Shlain, the book of *Genesis* has it backwards. The pain of childbirth is the cause of self-consciousness and not the result. For Shlain, the unique qualities of human sexuality and male-female relationships are connected with the emergence of self-consciousness, self-control, and free will in humans. Sex and reproduction de-coupled in humans. Humans, both male and female, were able and potentially willing to have sex at any time. But the female also developed the capacity to withhold sex at any time; she gained control over this biological function. She could disengage from the "be-here-now" and turn sex into a negotiation concerning the future. Hence, Shlain states that she developed an ego and a self-consciousness that could stand back from the world and from her instincts and consider the consequences of her actions. She acquired "free will" and a decision making capacity regarding the future. The ultimate objective of this new capacity was the establishment of a better male-female connection in child rearing – a stable parenting situation. Shlain calls this the **"Original Choice.**" Thus free will and future consciousness arose over the issues of sex, bonding, and child rearing – all psychological capacities connected with reproduction and the continuation of the species.

The capacity for choice and free will is often identified as one of the distinctive features of our species.[94] We are not ruled by instinct or set patterns of behavior. From this discussion of sex and bonding, we again see that free will is intimately connected with future consciousness. (Recall from the previous chapter the discussion on the interconnection between choice, free will, and future consciousness.) Only if we are aware of the future does it make sense to say we make choices. Making a choice involves thinking about different possible and potential actions pertaining to the future. In particular, when we make choices we consider the consequences of our actions. If a person doesn't consider the consequences of his or her actions, we say that the person is "thoughtless**,**" rash, or impulsive, reacting to the moment. Freedom of choice arises in the opening of the mind to the future and the various possibilities of action and their resultant consequences. In the present discussion we see that

the choices were over whether to engage in sex or not, as well as whether to commit and bond or not. These choices were made with an eye on the future.

Shlain also identifies the female as the first of the genders to conceptualize “deep time” and the future due to her understanding of the interconnection of the lunar cycle, pregnancy, and birth, as well as her grasp of the link between sex and reproduction. An apprehension of these processes all required an extended time perspective. While man had his gaze on the heavens, it was woman squatting in the dirt who noticed the synchronicity of the lunar and menstruation cycles, and figured out that the duration of pregnancy equated to a predictable number of lunar cycles.

As I have argued, there is a great evolutionary advantage in developing a more expansive sense and understanding of time – of learning from the past and anticipating and planning for the future. For Shlain, enhanced foresight develops in the female first – with the realization of the connection of sex and birth, but, as history unfolded, Shlain states that men would give themselves credit for the discovery of extended time. In early religion and myth, such as in ancient Mesopotamia, calendars and time originally fell under the sovereignty of female goddesses. But in later myths, male deities gained control of time and calendars. Also in Hinduism and Greek mythology, the sovereignty over time shifted from female to male deities.

For the female, it is self-evident that her children belong to her. For the male, it is not self-evident that he is the parent of his children. One of the main reasons behind the development of monogamy, from the male’s point of view, was to ensure that the children he was protecting, and helping to raise, genetically belonged to him. He stayed around to protect his female mate from being impregnated by other males. But in order for a monogamous sexual relationship to have significance to him, the male needs to understand fatherhood – that males**,** through sex, are also responsible for the birth of children. Whether the male “discovered” the connection of sex and birth or was taught this basic fact of life by the female, the insight of fatherhood and commitment to the consequent time and emotional investment of child-rearing required of him was a significant step forward in the evolution of future consciousness in the male.

Shlain believes that for the father the child becomes both representative of the future and a way of conquering his own death. Through the child the father lives on. This evolution in male psychology brought with it the idea of honoring the father and further reinforced and enriched the mechanism of culture as a way to pass on the ideas and values of the father. This insight and all the consequent practices that resulted from it constitutes the beginnings of fraternal heritage, which on one hand implies that we should look to our male ancestors (the past) for guidance but is predicated on the desire of the father to pass on to his children (the future) his identity and values. The child looks to the past in reverence while the father looks with hope to the future.

Shlain states that males discovered paternity around 40,000 years ago. The male changed his attitude toward the child and the mother and drastically altered the future course of human society creating a patriarchal social system.

Males increasingly "controlled" their own sexual behavior as well as that of their female mates. Males altered society so that their heirs could carry on their "names".

Let's turn now from love and sex to aggression and violence. In spite of the apparent oppositional qualities of these two motivational tendencies, we have already seen that, arguably, these motives are connected in our prehistory. According to Shlain and Ghiglieri, violent hunting behavior and aggressive competition among males were two primary means for achieving sex and bonding with females.

Human males are the most efficient hunters and killers in nature. In spite of the myth of the noble savage who lives in harmony and relative peace with nature, prehistoric human males are probably responsible for the extinction of numerous species across the entire face of the earth.[95] There has been an ongoing debate in the history of psychology whether aggression is learned or genetically inherited in humans, but our prehistory as well as contemporary physiological research seems to indicate a strong genetic component to male aggression.[96] As Howard Bloom illustrates with numerous examples, aggression, violence, and killing are ubiquitous throughout the animal kingdom and existed long before the emergence of human culture; aggressive and often violent human behavior is simply a manifestation of this fundamental propensity in nature.[97]

If anything, humans have taken violence and aggression to new heights. Shlain argues that *Homo sapiens* males have a highly developed aggressive nature. Only with *Homo sapiens* did organized kills develop to a high level. We became highly efficient and extremely dangerous social predators. For Shlain the biggest spike in increasing aggression occurred in the last 40,000 years. Diamond concurs on this point that "Man the Hunter" only emerged full-blown with our modern species. There is though disagreement over to what degree efficient hunting behavior was present earlier. Ghiglieri thinks that *Homo erectus* showed advanced hunting behaviors. At whatever pace male aggression and violence evolved, over the last three million years the hominid line transformed from being an animal of prey to being the most advanced and ferocious predator on the earth.

For Shlain, males had to develop the virtue of courage in order to hunt and kill animals, superior in size and ferocity. Courage is a future focused virtue in that the individual demonstrating this virtue exhibits determination to act in the face of anticipated danger. Although courage is a future focused virtue that is highly valued in many cultures, its evolution may be predicated on serving predatory behavior and human aggression. Throughout human history, it has been great warriors who most frequently are identified as courageous.

Predatory behavior is clearly future-focused since it serves the future end of obtaining food. Within human evolution, aggression also has a future focused dimension – it is not simply an impulsive instinctual reaction. Not only does aggression connect with predation, but following Ghiglieri, aggression within male competition helps the male in finding female mates and sexual partners. Reinforcing this point, Bloom argues that throughout history women tend to

select as mates those males who are the most violent and aggressive.[98] Yet, aggression has mixed future benefits. As Diamond points out, modern humans have inherited two destructive traits from our ancestors. We kill each other in large numbers – our aggressive competitiveness – and we kill off other species. The general tendency to destroy and despoil our environment is an offshoot of our aggressive and highly effective hunting behavior.[99] In this case, the evolutionary heritage of future consciousness is a double-edged sword.

As we have seen, following the arguments of Shlain and other writers, sex and aggression are linked together and in humans both involve strong elements of future consciousness. As one final perspective on this topic, Harold Bloom, in his book *The Lucifer Principle*, presents some important and relevant ideas. As noted above, Bloom contends that violence is a fundamental and pervasive phenomenon throughout nature, and that, moreover, violence, killing, and destruction have a highly significant adaptive function or value. Nature is a competitive arena and violence is an expression of this competitive dimension; nature evolves through competition, and often this competition involves the aggressive or violent intimidation, if not elimination, of competitors. Of special note, as Bloom documents with countless examples, members within a species compete against each other, often through aggression and violence, for dominance in pecking order hierarchies; the strongest, most aggressive, and most intimidating make it to the top. For males, dominance within a pecking order brings with it the privilege to procreate with females; those males at the bottom of a pecking order have a difficult time finding receptive mates. Hence, competition and violence are connected with power in a social group and create opportunities for sex and procreation. Bloom also contends that violent competition between social groups has occurred throughout human history, again serving the function of securing female mates for procreation, as well as control over territory and resources. As documented throughout human history, conquering armies often kill the children and procreate with the females of the conquered group; males of various other species also show the same behavior after defeating the dominant male within a social group. Human males compete both individually and socially, often violently, for power and the opportunity to continue their genetic line.[100]

Hence, Bloom's analysis further reinforces the connection between sex, bonding, and procreation on one hand and aggression and violence on the other. Love and hate – the great polarities of human existence **-** often equated with the good and evil sides of our species – have evolved together in our history. Both human qualities reflect an inseparable mixture of genes and culture, of impulse and deliberation. As argued in the opening chapter, future consciousness is not simply a cognitive capacity, but one that also involves a powerful emotional and motivational dimension as well. Two of the key elements in the emotional-motivational dimension are sex and love and aggression and violence.

Agriculture, Reciprocity, Conquest, and Ecological Control

"The history of civilization is essentially
a history of mankind's increasing ability to predict the future."

Anthony Reading

After the Great Awakening, the next great burst in human evolution was the development of agriculture and the consequent emergence of large urban settlements which coalesced into the earliest nations and empires. Agriculture, in fact, is frequently cited as the "greatest idea" humanity has ever created.[101] This developmental jump into what we would call "human civilization" occurred roughly between twelve and six thousand years ago, during a period when the climate on the earth warmed and stabilized, though the seeds (so to speak) of this monumental revolution in human existence go back to the Upper Paleolithic Age. The remains of settlements of a hundred people or more, containing relatively permanent large habitable structures, can be found in Eastern Europe and Western Russia dating back tens of thousands of years.[102] In general, humans probably began to move toward a more sedentary lifestyle before the appearance of large scale and systematic agriculture.[103] Also, based upon archeological evidence, it has been argued that the rudiments of civilization, which include art, symbolic notation, and large habitats, go back at least 20,000 years.[104] Trade and exchange, connecting settlements and different groups of people across long distances, also extend back tens of thousands of years. Also it seems clear that the first efforts at agriculture occurred in a relatively unsystematic, trial and error fashion, long before the appearance of the first major urban centers that depended primarily upon agriculture for food. Yet beginning in the "Fertile Crescent" in Mesopotamia and involving first the domestication of plants, followed approximately a thousand years later with the domestication of animals, humanity across much of the face of the globe moved from a predominantly foraging, hunter-gatherer, and nomadic lifestyle to a more sedentary, urbanized, and agriculturally based way of life. This occurred over roughly a five-thousand year period constituting the Agricultural Revolution.[105] Describing this transformation in more combative terms, Bloom depicts the process as a growing competition between burgeoning cities and pre-existing nomadic peoples, with cities eventually winning and progressively wiping out indigenous populations.[106]

The emergence of agriculture is a prime example of both reciprocal evolution and the expansion of future consciousness. As David Christian notes in his grand history of both physical and human evolution, *Maps of Time*, domestication, which is an essential element of agriculture, transforms both the life forms domesticated and those doing the domestication. Through selective breeding humans altered both animal and plant life, but in this process, humans became increasingly dependent on these altered life forms for their existence. Over the millennia our bodies have undoubtedly adjusted to the types of foodstuffs that we have nurtured and created through domestication.[107] And furthermore, we have progressively lost the abilities of our ancestors to hunt and

forage for food in the natural environment. Paraphrasing the philosopher Hegel, the master became the slave of its own creation.

Agriculture is connected to future consciousness in a very simple and dramatic way. As agriculture spread across the globe, it represented the most pervasive and powerful intentional manipulation of the natural environment undertaken by humans up to that point in time. Agriculture is long-term, goal-directed planned behavior on a vast scale. Humans were not intentionally trying to change the biosphere of the earth when they began to domesticate and plant wheat, rice, and barley, but they were purposefully transforming the natural environment, bit by bit, and doing so in such increasingly great numbers that the result was a global change of unparalleled proportions.

This purposeful manipulation of the environment included a significant reciprocal feedback loop. To begin with, agriculture was neither systematic nor large scale. But as humans became increasingly dependent upon whatever foodstuffs were planted and harvested, and learned about the process of cultivation, through trial and error larger scale and more systematic efforts emerged. Humankind, in interacting with nature, learned how to manipulate and control it. Although agriculture is a purposeful activity directed by humans, its growth was a co-evolutionary process.

Humans undoubtedly engaged in coordinated and long term planning prior to the Agricultural Revolution. The hunter-gatherer way of life also involved planning over an extended period of time. Hunter-gatherers had to learn the patterns of migration and the seasonal cycles of vegetation in the environment around them. Coordinating a hunt and executing it also required taking an extended view on the future. As noted earlier, Calvin has suggested that the general capacity for planning and foresight was dramatically enhanced through having to learn how to throw weapons and bring down moving animals in a hunt.[108] Still, as it evolved agriculture required a level of socially coordinated long term planning on a scale that far exceeded hunter – gatherer activities.

Agriculture involves a significant alteration of the environment. No longer were humans simply adapting in a passive or reactive way; our ancestors were altering the environment to serve our ends. This is active adaptation. Humans were undoubtedly purposefully manipulating their environment before agriculture, but agriculture is a significant jump forward in this capacity for active adaptation. The active and purposeful manipulation of the environment, and the degree to which we can accomplish this end, is one of the most distinctive features of our species.

Purposefully controlling the environment to serve human ends is one of the most fundamental expressions of future consciousness. It is a capacity that humans have increasingly improved throughout history. As noted earlier in this chapter, all life requires resources from the environment in order to survive, and all life has developed abilities for seeking out and procuring these resources. What humans have become more efficient at throughout evolution is extracting resources and finding ways to maximize the potential output of the environment.[109] Much of technology serves this end, from the stone tool for hunting and butchering animals to dams and massive electrical generators for

providing energy. Manipulating the environment to serve needs and goals is a future oriented activity. Evolving this future oriented capacity serves human survival. Thus although we may criticize modern human society for using up natural resources and destroying the environment without any forethought regarding where it is all leading, such activities were built upon thinking about the future and purposefully acting to serve future ends. The world of agriculture, industry, cities, technology, and the global transformation of earth ecology is a manifestation of future consciousness. What we can say in response to present ecological concerns is that our goals and plans were probably too short sighted in the past – we did not sufficiently consider longer term consequences – in the future we need to think out further into time.

The growth of agriculture was connected with the emergence of increasingly larger urban settlements. Humans became more sedentary and clustered into progressively larger groups. Although Upper Paleolithic humans both created relatively permanent settlements and lived together in social groups (probably connected through kinship), Paleolithic humans in general probably lived in relatively small groups of ten to twenty individuals.[110] Although towns and cities are localized concentrations of population, these urban settlements became hubs of trading and exchange; the economic lines of interaction extended outward across large geographical areas. Again, although Upper Paleolithic humans traded with each other, often across long distances, with the emergence of cities trade and exchange increased dramatically. As Bloom describes it, with the growth of cities we see the emergence of "*Homo commercialis.*" Through trade, cities provided a way in which humanity began to weave itself together in a more intricate, rich, and more extended fashion than ever before.[111]

As Bloom points out, every human society has some kind of principle of "give and take." In order "to get you have to give." Bloom refers to this principle as "reciprocity" and asserts that trade and exchange are built on the principle of reciprocity. In fact, for Bloom, reciprocity is the great power attractor in human affairs. It was one of the two major forces that weaved humanity together.[112] (I will come to Bloom's second major force momentarily.) As cities grew, with consequent increasing specialization, division of labor, and improved transportation, humans expanded the range and form of reciprocities of exchange among themselves. Interdependencies grew; the human social network progressively evolved.

Thus we see in Bloom's description another significant application of the idea of reciprocity to the structure and evolution of humanity. Not only is reciprocity the basic principle that underlies trade and exchange among humans, it is reciprocal trade and exchange that provides one of the most powerful integrative forces at work in human evolution. We come together and weave networks of interdependency through the creation of reciprocities.

In his book *Nonzero: The Logic of Human Destiny*, Robert Wright presents a related argument regarding the importance of reciprocity in cultural evolution.[113] Wright contends that there is a discernable and progressive general direction throughout all of human history. This direction is toward increasing social

complexity based on the development of mutually beneficial relationships or transactions among people, individually and collectively. Although we all possess a basic need to serve our own individual interests, we repeatedly find that we can establish “win-win” transactions with others that benefit us individually. These arrangements, both supported and fueled by technological innovations, add to the complexity of our societies. In essence, social complexity grows through the evolution of reciprocities that mutually support the individual lives of those involved. Through the establishment of various types of exchange we evolve social complexity as well as serve ourselves. Note that this is another example of how the self and society form a reciprocity – each facilitates the evolution of the other.

Wright contends that if we look at human history we find that cultures do not remain static but, at different rates, invariably move in the direction of establishing more and more “win-win” relationships among the members, consequently moving in the direction of increasing complexity. There are, of course, many cases where individual societies collapse or disintegrate, e.g., the Roman Empire, the Egyptian Empire, and the civilizations of the Aztecs, Mayans, and Incas, but the overall direction across the entire globe has been increasing complexity and “win-win” relationships. Wright argues that this basic pattern of evolution or progress applies not only to all individual human cultures but to the total global scene of humanity. As a social species, our world is more complex and filled with more “win-win” reciprocities than in the past, and in fact, we are increasingly integrated and connected via these transactions and arrangements.

For Wright reciprocal exchanges do not just develop between urban settlements, as Bloom highlights, but as a general principle, such exchanges developed among humans at all levels of social organization. One important example of this would be the evolution of male – female relationships which I discussed in the last section. Wright identifies the formation of reciprocities as the essence of increasing social complexity or social evolution, whether it is among the members of a society or a family. Social evolution is the creation of new reciprocities. Wright notes that the creation of reciprocities benefits the individuals who establish the exchange. Social complexity supports individual survival or development.

This final point relates back to Bloom’s contention that it was trade and exchange that increased the power and amplified the growth of cities. Cities as nodes in a network of exchange grew as the network got richer and stronger. The complexity of the whole benefits the parts. Thus, we come back to Bloom’s argument that urbanized humanity progressively out-competed nomadic and indigenous groups of humans. Cities became much more complex, organized, and richer through trade and exchange than nomadic people. The web of influence and power of cities grew as urbanized humanity progressively assimilated the more ancient hunter-gatherer people of the world. There have been, of course, episodes where nomadic groups have conquered urban societies, but the overall trend through history has been in the opposite direction. We see this trend still continuing today.

We now come to Bloom's second force**,** one that has progressively integrated humanity. Bloom believes it is conquest. As I have already described, prehistoric human males developed highly efficient hunting behaviors as well as a strong disposition toward aggression and violence in competition among themselves that served them well in obtaining meat and mates. Still, there does not seem to be any clear evidence that prehistoric humans engaged in war. Yet when we come to the rise of cities and agriculture, war emerges among different cultures and groups of people. We show a history, since becoming "civilized," of engaging in almost incessant war and conquest. War as a means to conquer is a future oriented form of thinking and behavior; it involves goal setting, planning, flexibility, creativity, courage, and often complex strategic thinking. In fact, the capacity for military strategy emerged in our history as one of the most socially celebrated forms of future consciousness; many of the most famous people of the past are military strategists and leaders.

Military conquest leads to the assimilation and connecting together of different groups of people through domination. War and conquest leads to the formation of nations and empires. As Bloom notes, whereas reciprocity unites through exchange, conquest unites through domination.

Clearly, competition has been a major force in the evolution of life and humanity, although not all competition is aggressive or violent. Competition can occur along any dimension or skill that makes a difference in terms of survival. As noted earlier, competition fuels the Red Queen Principle. Competition leads to the extinction and elimination of species, or individual members within a species, in the interactive "struggle for survival." *Homo sapiens* probably out-competed and extinguished Neanderthals. Competition is a central principle in Darwin's theory of evolution (though not the only one).[114] War and conquest is one major manifestation of evolutionary competition in the history of humanity.

Bloom argues that there are two apparently opposite principles at work in the evolution of modern humanity, both of which produced integration – reciprocity and conquest. This duality of principles corresponds with a major theme in contemporary evolutionary thought. As Stewart argues, as does Lyn Margulis, who has achieved great notoriety and influence in her theory of evolution, cooperation is a powerful force in evolution.[115] Cooperation is often juxtaposed with competition as the two primary forces at work in evolution. Although competition is important, life also evolves through the development of cooperative relationships, e.g., symbiotic connections, multi-cellular aggregations, ecological interdependencies, and divisions of labor.

Reciprocity is a form of cooperation – in fact, it may be the essence and fuel of cooperation for without benefit to all those individuals involved, why would individuals establish cooperative relationships? Stewart argues that the development of cooperative relationships can be of benefit for all participants and provides an overall progressive direction to evolution.[116] On this point he sounds very similar to Wright. Thus reciprocity, in so far as it is built on cooperative exchanges, provides a complementary mechanism to competition in driving the evolution of life and humanity.

Reciprocity has not only served as a primary mechanism for the creation of biological and social complexity, it provides a universal principle upon which human values and ethics around the world have been developed and defined. Reciprocity is the foundation of the concepts of justice, equity, and perhaps even human care and kindness. To recall, as Bloom notes, all human cultures acknowledge and reinforce in their values and practices the importance of giving in order to get. If someone takes but does not give, humans in general find this objectionable. Exchange must be fair, or else someone feels cheated or robbed. Humans often give though not with any immediate return benefit, but with the hope and expectation that in the future their good deeds will be returned in kind. Social relationships and bonding are often cemented through gift giving and favors offered, with the expectation of future return and obligation. Sociobiologists have argued that apparently selfless and altruistic behaviors in humans are built upon the principle of "reciprocal altruism." We give of ourselves because in some way it benefits us (in particular, our genetic line) in the long run.[117]

The valuing of reciprocity can also serve as an instigator for retribution (retributive justice), violence, and even war. We enact punishments on those who do not follow this principle – who take without giving – and we go to war when we believe we are wronged or not given what we believe is our due. War is often started over perceived injustices or inequities. Thus although reciprocity and conquest at one level are opposites, the perception of not honoring the principle of reciprocity can lead to war and violence. Our history is filled with examples of this form of thinking and behavior.

Wright believes that internal social revolutions occur because leaders do not sufficiently abide by the principle of reciprocity. In Wright's mind, authoritarian systems of government invariably falter or fail at some point because they do not support "win-win" transactions among their members. They collapse or have to be revamped because of a lop-sided "win-lose" arrangement by which those at the top of the system accrue a disproportionate share of the benefits resulting from the social transactions among their members. People rebel when they feel there is too much injustice and inequity in their social system.

Reciprocity therefore emerges in ancient times as an operative principle in human future consciousness. With an eye on the future, we exchanged and we gave in order to receive; we conceptualized early on that what goes round comes round; we developed mutual commitments and social bonding based on gift giving and "unselfish acts." We developed moral expectations that we must practice and honor just and equal exchanges. We made choices and guided our behavior in accordance with the value of reciprocity. Evidently, at the other end, often we took without asking or giving in return, but this frequently led to punishment, retribution, and even war. The history of humanity is of course filled with injustice, with selfish and inconsiderate actions, with conquest and violence without any concern for the other, but much of what we have purposefully developed and accomplished has been built on the creation and honoring of reciprocities.

As humanity was developing more complex social organizations, creating large urban settlements, and networking through trade and exchange, religion and myth were also evolving as important, if not central, dimensions in human thinking and behavior. As noted in the previous section, humans were burying their dead with artifacts, creating cave paintings with magical and shamanistic qualities, and carving fertility sculptures long before the emergence of agriculture and large urban settlements. As Shlain and Fraser argue, religion and the belief in an after-life emerged with the psychological realization of death, which may have occurred at least 50,000 years ago. Even if we discount such suggestive archeological evidence and arguments, there are strong indications that around 12,000 to 10,000 years ago religion and mythic belief, in a more modern recognizable form, emerged as a powerful and central force in human reality. This "religious revolution," as it has been called, may have occurred even prior to the full blossoming of agriculture. As Watson describes it, in the first large urban settlements, which have been uncovered in the Middle East, people began to create "human-like" representations of deities. In particular, two figures predominate: a woman Goddess figure and her partner/offspring, a male Bull figure, presumably representing the female and male principles of life. The Goddess figure appears to be the supreme deity since she is depicted as giving birth to the male Bull deity. The woman figure seems to represent the power of fertility and the regeneration of life in the spring, whereas the male seems to represent, initially, virility and the "untameability of nature," and later, the domination over nature and animals. What is seen as especially significant in these representations and the worship of them is that first, humankind appears to be expressing a desire to control nature and animals, and second, the figures seem to reflect a belief in a higher level of reality above both humans and nature.[118]

Hence, at least three types of duality in thinking are expressed through these representations: The duality of male and female, with the female being the supreme deity; the duality of humans and nature, with the humans expressing a desire to control nature; and the duality of humans and higher beings, with humans presumably drawing their inspiration and power from these worshipped deities. What is particularly interesting about all of this is that as a prelude or stimulus to the growing conquest and control of nature through agriculture and the domestication of animals, there was a shift in mindset within humans that expresses this aspiration to gain control and dominion over nature and that this conscious desire was expressed through religious symbolism and worship.

Sexual power, religion, and the future make for an interesting combination of themes, and in our pre-history all three appear to be woven together. Our earliest religious thinking and myth making, while grounded in sexual symbolism, appears to also address concerns about the future. The Goddess and the Bull are personifications of the power of sex and reproduction, and also represent the conquest of nature and even death (it is the Goddess principle that recreates life in the spring). The female and male principles have also been connected in our history with the ideas of nurturance and conquest which leads us back to the ideas of cooperation and competition, the two fundamental forces behind the

evolution of human society. The sexual duality and reciprocity of female and male makes the world go round and in many ways underlies humanity's conscious desire to mold and create the future.

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