

# **The Evolution of Moral Sense and the Art of Mature Conscience**

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Prepared for the

2013 Company of Ideas Forum on Art as a Source of Knowledge

May 18-19<sup>th</sup> 2013 at

The Jeffrey Rubinoff Sculpture Park

### **Biography of David Lawless**

David Lawless is pursuing an MSc in Biodiversity Conservation & Governance at the University of Oxford. His research focuses on evolution, integrative biology, and the management of protected areas. For the past four years, David has worked with Parks Canada as a naturalist and interpreter, using art and science as a way of connecting visitors to national parks. His interests include the history of science, evolutionary ethics, and extend, as a classically trained pianist, to music. Prior to his graduate work at Oxford, David completed his Honours Bachelor of Science at the University of Guelph where he studied ecology.

## Introduction

According to sculptor Jeffrey Rubinoff, in order to understand the role of the artist in society, we must first integrate natural history with history itself since all humans share the narrative of natural history<sup>1</sup>. Central to this understanding is the examination of Darwin's theory of evolution by natural selection, which provides a judicious account of human development, including the mental powers and intellectual faculties considered key to artistic expression. Although many scholars, scientists and historians alike, often take possession of Darwin's terminology rather than his leading ideas, it is important to establish the scientific basis for many of his arguments which have considerable implications for enriching the role of art in society<sup>1</sup>. Expanding on evidence for Rubinoff's argument suggesting that the Paleolithic age represents a vital point in the evolution of artistic development<sup>2</sup>, I plan to address the issue of moral sense according to Darwin and integrate this concept into Rubinoff's definition of art as "an act of will in accord with a mature conscience". I propose that moral sense is a necessary condition of a mature conscience and, as such, we must consider if this condition is evolutionarily derived.

Since Darwin was one of the first to approach moral sense exclusively from the side of natural history, there was limited empirical evidence at the time to support or refute his theory. As a result, this paper will examine the scientific development of moral sense expounded by Darwin and place this concept within the framework of modern evolutionary theory. I contend that there is sufficient scientific evidence to support Darwin's concept of moral sense as a product of evolution which places Rubinoff's notion of 'mature conscience' within the realm of scientific credibility. After a careful examination of Darwin's original texts and those scholars whom he influenced, I will present an argument in favour of the protection of diversity and highlight some of the scientific consequences for transgenic engineering. Finally, I will discuss the implications of moral sense as a means to move beyond the age of agriculture, and as Rubinoff argues, "the plasticity of morality".

## Foundations of Moral Sense

In *The Descent of Man, and Selection in Relation to Sex*, Darwin proposes that moral sense, by which he means to suggest conscience, can be explained in terms of natural history as the result of evolutionary processes. Moral sense, as he argued, was the biological basis of

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<sup>1</sup> Rubinoff, 2012. *Existential Realities of Post Agriculture*, p. 21.

<sup>2</sup> See Rubinoff, 2010. *Art Beyond War: A Discussion About Prehistoric War and the History of Art by Artists*.

morality, obtained from ancestors through the process of natural selection<sup>3</sup>. Darwin described moral sense as being the highly complex sentiment that tells us “what we ought to do and the conscience which reproves us if we disobey it” (p.93). For Darwin, the moral sense or conscience was also considered to be the most important distinguishing feature of all the differences between modern humans and lower animals. Nevertheless, he maintained that while “the difference between the mind of the lowest man and that of the highest animal is immense”, a moral sense was one of degree and not of kind:

*“any animal whatever, endowed with well-marked social instincts, would inevitably acquire a moral sense or conscience, as soon as its intellectual powers had become as well developed, or nearly as well developed, as in man.” (p.72)*

In his determination, Darwin considers four main factors as being fundamental to the development of moral sense. First, the social instincts “led an animal to take pleasure in the society of its fellows, to feel a certain amount of sympathy with them, and to perform various services for them”. Second, the development of mental powers enhanced the memory and mental evaluation of past impressions and actions, both good for and detrimental to the community, which guide individuals to act differently for the future. Third, as mental powers and intellectual faculties developed, the power of communication and language grew stronger, thereby allowing individuals to become consciously aware of the needs of others and express their own desires. Finally, habitual behaviour, which benefited the community through a repeated standard of conduct, helped solidify social instincts of mutual aid in society. Of these four main factors, the social instincts and development of mental powers were considered the most essential in forming moral sense, whereas development of language and the inherited habits, while both important contributors, served to reinforce the moral sense, or conscience.

Nevertheless, it is our social disposition as humans that Darwin argued was paramount to the development of moral sense, asserting that “the moral sense is fundamentally identical with the social instincts” since both related at first exclusively to the community. Furthermore, humans are, by their very nature, social animals as a consequence of natural selection. For example, Darwin maintained that humans were descended from some comparatively weak but social species, such as the chimpanzee, rather than from some stronger but unsociable and

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<sup>3</sup> Natural selection is the mechanism by which beneficial variations or traits in a population tend to be preserved while unfavorable variations tend to be lost, as a function of differential survival and reproduction (*Origin of Species*, p.145). Evolution is the change in the inherited characteristics (i.e. gene frequencies) of biological populations over time.

isolated species, such as the gorilla<sup>4</sup>. This social behaviour contributed to mutual aid among groups which increased the fitness and evolutionary potential of the species. Therefore, because of our social instincts Darwin claimed that other faculties, such as mental powers and communication, could emerge and further contribute to moral sense.

In the development of mental powers, the ability to evaluate past experiences and impressions allowed humans to evaluate their actions as being advantageous or harmful for the community, and to adjust them suitably for the future. This power of memory, acquired through mental powers, is what Darwin also believed reinforced our moral sense or conscience:

“A moral being is one who is capable of comparing his past and future actions or motives, and of approving or disapproving of them. Man, from the activity of his mental faculties, cannot avoid reflection: past impressions and images are incessantly passing through his mind with distinctness.” (p.89)

This mental power, Darwin insisted, would be the beginning of conscience. It is highly probable that the intellectual faculties have been gradually shaped either directly or indirectly by natural selection, since these faculties are variable and are inherited<sup>5</sup>. Darwin notes that in primitive society, individuals who were most perceptive and who were best able to defend themselves and care for their group, would rear the greatest number of offspring. Hence, it seems entirely possible from Darwin’s account that “the number of men gifted with such virtues could be increased through natural selection, that is, by the survival of the fittest.” (p.163) Following this development of mental powers and intellectual faculties, language and communication significantly improved in humans. Darwin explains:

*“If it be maintained that certain powers, such as self-consciousness, abstraction, etc., are peculiar to man, it may well be that these are the incidental results of other highly-advanced intellectual faculties; and these again are mainly the result of the continued use of a highly developed language.” (p.105)*

While a ‘highly developed language’, mostly linguistic, is used to explain the power of communication in forming moral sense, I argue that this ‘developed language’ could also extend to include artistic expression. Evidence suggests that the language of art, both visual and musical, can facilitate the conscious exchange of ideas of others and to express this collective memory for the future. Further, being able to communicate and transmit information more

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<sup>4</sup> Using modern phylogenetic analyses, we now know that Darwin’s prediction of human ancestry is accurate.

<sup>5</sup> The requirements for natural selection to act: variation among individuals in a population, heritability of this variation, and differential survival or reproduction associated with the particular trait in question.

effectively than written or spoken language, as well as to inscribe this memory for the future, is extremely important for our survival as a species<sup>6</sup>. However, this does not reduce artistic expression and aesthetic experience to some biological function or imperative. Instead, it suggests that genes selected for highly developed intellectual faculties, including language and visual acuity, were also associated with traits important for artistic expression, such as imagination and abstraction. Studies suggest that imagination and abstraction serve to enhance the imprinting period of learning which is vital to the development of intellectual faculties. Therefore, it is not unlikely that selection of traits responsible for highly developed intellectual faculties also included traits linked with artistic expression. Interestingly, Darwin believed that the success of these highly developed intellectual faculties in societies was achieved “mainly, though not exclusively, through their arts” (p.160). Although he mainly considered these ‘arts’ as inventions of technology, traits such as adept visual acuity necessary for their production would have been extremely beneficial for survival. Through selection for this heightened visual acuity, other traits associated with artistic expression would also be enhanced<sup>7</sup>. In Europe, for instance, the success of humans supplanting primitive societies of the Bronze Age was “probably due in a degree to their superiority in the arts” since “the habitual practice of each new art would likewise strengthen the intellect” (p.160).

Not only was the power of communication and language vital to the development of moral sense, but Darwin also believed that “the effects of habit naturally lead to the foundation of a moral sense” (p.106). He argued that individuals would acquire habits of socially approved behavior that would direct the moral instincts, through which individuals would learn how to help their neighbours and advance the welfare of their group. Habitual behaviour, according to Darwin, was a means to balance the social instincts, with their derived virtues such as sympathy, against the lower and stronger impulses or desires. The struggle between noble acts and the often stronger impulses which lead individuals to gratify their own desires at the expense of others, was characterized as one requiring self-command. Darwin argued that: “through long habit we acquire such perfect self-command, and man’s desires and passions will at last instantly yield to his social sympathies” (p.91), thereby reducing the struggle between the higher and lower impulses until the virtuous social instincts become inherited through natural selection. From Darwin’s estimation, if an instinct, such as sympathy, is in any way more beneficial to a species

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<sup>6</sup> Koernig, 2009. *The Inherent Value of Art at the End of the Age of Agriculture*. p. 7.

<sup>7</sup> Lawless, 2012. *On the evolutionary origin of artistic development in the Chauvet cave paintings*. p. 4-5.

than some other or opposed impulse, the former would be rendered the more potent of the two through natural selection, and individuals which had it most strongly developed would survive in larger numbers. These habits, as Darwin maintained, were followed during many generations and, in the future, “we may expect that virtuous habits will grow stronger, becoming perhaps fixed by inheritance” (p.104). Hence, what originated as a basic instinct responding to obvious perceptual cues in our human ancestors would become, from Darwin’s view, a moral motive under the guidance of social behaviour and intelligence.

Clearly the account that Darwin gives in explaining the evolutionary origins of moral sense is a matter of defining the necessary inputs rather than predicting the outcomes. These four conditions or ‘inputs’ (i.e. social instincts, development of mental faculties, power of communication and habitual behaviour) are necessary, but equally, they are not predictive of a unique outcome of moral sense or conscience. Indeed, moral sense is not only a necessary condition of a mature conscience, it is arguably a mature conscience, at least in how Darwin characterizes it:

*“Ultimately, a highly complex sentiment, having its first origin in the social instincts, largely guided by the approbation of our fellow-men, ruled by reason, confirmed by instruction and habit, all combined, constitute our moral sense or conscience.” (p.166)*

As the moral sense evolved, so did our distinctively human nature along with all the inherent existential realities Rubinoff has outlined<sup>8</sup>. Therefore, we must now consider the extent to which current scientific evidence supports Darwin’s evolutionary model of moral sense to determine how social behaviours of conscience, such altruism and co-operation, occur in different degrees (i.e. suggesting maturity of conscience). Darwin’s construction of moral sense, at least initially, supports the idea that in order to survive, humans must have evolved their consciousness, which as Rubinoff argues is the existential commitment of the artist.

## **A History of Moral Sense**

According to Darwin, our moral sense is based primarily on social instincts, which is the product of evolution by natural selection. Yet, he also recognized that there is a degree of cultural evolution that also exists, as both our intellectual capacities and sheer cultural knowledge have increased over time. Likewise, Rubinoff describes maturity of conscience as the

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<sup>8</sup> Rubinoff, 2012. *Existential Realities of Post Agriculture*, p. 4.

degree to which consciousness is engaged with the collective memory, which is determined by the extent of knowledge accumulated by an individual. Rubinoff contends that cultural selection also acts on the continuum of moral sense such that selection of leadership and direction of a culture is based on what it considers best for that society to survive. For Darwin, the evidence that humans are now much more developed intellectually than our ancestors 200,000 years ago supported the idea of cultural evolution of moral sense and that, as a result, “the standard of morality has risen since an early period in the history of man.” (p.103). However, in order to understand the evolutionary origin of moral sense or conscience we must not only account for cultural evolution, but also the role of social behaviours in human evolution. This inevitably leads us to consider the ideas presented by the Russian zoologists and evolutionary theorists Karl Kessler and Petr Kropotkin.

Kessler proposed that, while Darwin’s work certainly permeates the idea of competition between animals for food and reproduction, there is also “the law of mutual aid, which, for the success of the struggle for life, and for the progressive evolution of species, is far more important than the law of mutual contest” (p.14). Kropotkin expanded Kessler’s idea and hypothesized that mutual aid is not only a law of nature as a factor of evolution, but is also an argument in favour of a pre-human origin of moral instincts since “mutual aid is the surest means for giving to each and to all the greatest safety, the best guarantee of existence and progress, bodily, intellectual, and moral.” (p.73). Competition, Kropotkin maintained, is not the rule in the animal world, but instead the exception. He believed that the elimination of competition by means of mutual aid and mutual support provided better conditions for survival and that “no progressive evolution of the species can be based upon such periods of keen competition” (p.13). This is a further extension of the arguments Darwin himself expressed in *The Origin of Species*:

“One of the most frequent modes in which Natural Selection acts is, by adapting some individuals of a species to a somewhat different mode of life, whereby they are able to seize unappropriated places in Nature” (p. 145)

In other words, natural selection continually seeks out ways of avoiding competition as much as possible. Although this tendency of nature is always present, it is not always fully realized, and as a consequence, this struggle for life as competition has been used as an argument to support



the view that the strong should thrive at the expense of the weak<sup>9</sup>. We are rightly critical of simple generalizations of biological concepts as applied to the study of human affairs. It is important not to misstate the reach of natural selection and reduce artistic expression and aesthetic experience to some biological function, since every artist has different priorities which cannot be reduced to one practice. It is one thing, of course, to explain natural selection; it is another thing to justify it, for which we need only look to Huxley, Spencer, and Heidegger<sup>10</sup>. While Kropotkin, in fairness, also declared that co-operation should be the basis of our social order, he also did not completely exclude the role of competition, admitting that, “there is, within each species, a certain amount of real competition for food at least, at certain periods”. As a result, he did not drastically oppose Darwinism but rather expanded its scope by acknowledging the significance of competition as a complementary mechanism to mutual aid in evolution.

The reason I discuss Kropotkin’s theory of mutual aid is that it raises the importance of social behaviours such as altruism and co-operation, behaviours that scientific evidence suggests are genetically and socially evolved<sup>11</sup>. Since these instincts require some degree of conscience, they have considerable implications for moral sense as well as ‘mature conscience’ proposed by Rubinoff. Darwin urged that the moral sense, the motive feeling which encouraged individuals to perform altruistic acts and impelled dissatisfaction when these acts were ignored, was at its root a social instinct. From his work, we see that humans have a disposition certainly to act within small social groups particularly when these were kin groups. Eventually, these groups coalesced over time to form larger groups and societies. His view, also shared by Kropotkin, was that a form of group selection<sup>12</sup> could explain certain human social instincts such as altruism. There is still much debate, however, about whether natural selection operates at levels of organization higher than the individual,<sup>13</sup> to produce adaptations that benefit larger, non-kin groups. This debate can largely be attributed to the difficulty of empirically testing behaviour as opposed to

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<sup>9</sup> Social Darwinism, expounded by Herbert Spencer, is justly criticized as a crude manipulation of Darwin’s theory of natural selection to support Spencer’s own anachronistic ethical theories.

<sup>10</sup> Heidegger, for example, maintained that conscience was a negative force that tells one not to do something (*Being and Time*). He may have taken Darwin out of context in this justification: “the highest stage in moral culture at which we can arrive, is when we recognize that we ought to control our thoughts” (*Descent of Man*, p.101). Thomas Huxley, in a series of famous essays about ethics, advanced his own “gladiatorial” view of natural selection as a being in a state of perpetual competition, based on Darwin’s work.

<sup>11</sup> Social evolution, as proposed by the evolutionary biologist William Hamilton, refers to social behaviors that have fitness consequences for individuals other than the actor alone (e.g. altruism and mutualism).

<sup>12</sup> Group selection theory states that natural selection can act on competing groups of individuals, not just competing individuals within a group.

<sup>13</sup> Although natural selection acts on phenotypes, there are four levels of biological organization through which it can operate: gene, individual, kin/family, group/species.

testing the morphological evolution of a species trait. Therefore, arguments for and against group selection models of conscious behaviors have been widely criticized. Since Rubinoff argues that individuals who can perceive and act in accord with this inner intuitive sense of conscience are of great adaptive value, we must examine current scientific theory to determine to what extent behaviours such as altruism and co-operation are accurate indicators of what is meant by ‘mature conscience’. To do this, it is important to highlight the state of current scientific evidence of how natural selection could produce conscious behaviours.

### **Modern Science and Evolutionary Theory**

In order to understand empirically the evolutionary origins versus learned origins of social behaviours, we must discuss the biological levels upon which natural selection acts. Although Darwin’s theory of evolution emphasized the role of selection acting on individuals of varying fitness, group-oriented altruistic behaviours were seemingly inconsistent with his model. Consider, for example, a shared resource within a tribe of Paleolithic humans. Carefully managing this shared resource benefits all members of the group, especially those individuals who ‘cheat’ by consuming more than others. However, this selfish ‘cheating’ behaviour, Darwin predicted, is problematic to the survival of the group because “social instincts [such as altruism] never extend to all the individuals or the same species” (p.85). It seems obvious that individuals who are selfish will attain a greater level of fitness at the expense of other altruistic members of the tribe. Over time, genes associated with this so-called ‘cheating’ would spread throughout the tribe, and the tendency for co-operative management of resources would collapse, thereby leading to group extinction. In this case, altruism explained by group selection is undermined by selection of individuals within the group. Thus, altruistic behaviours pose a challenge to evolutionary biologists because natural selection in its simplest form favours selfish individual behaviours over altruistic ones. Why, then, have behaviours with public benefits and private costs still evolved in the population?

In the 1960s, scientists began to explain selection that acts on levels of biological organization greater than the individual. William Hamilton proposed a theory of kin selection<sup>14</sup> of inclusive fitness, in order to explain how some behaviours can increase the fitness of an

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<sup>14</sup> Kin selection is an evolutionary strategy that favours the reproductive success of an organism's relatives, even at a cost to the organism's own survival and reproduction. In kin selection, fitness is measured not only by direct individual reproduction, but also by including indirect fitness effects such as the reproductive success of close relatives.

individual's relatives, even if the trait is disadvantageous to the individual. Hamilton's theory was that animals might co-operate because they have genes in common or because of the likelihood of reciprocal aid in the future. Some forms of altruistic behaviour such as parental care can be explained by kin selection, where the parent spends energy caring for offspring because it increases the indirect reproductive success of the parent's genes. In kin selection theory, fitness is composed of direct and indirect fitness, defined as inclusive fitness, and takes into consideration the direct benefits of individual reproduction and survival as well as the indirect fitness of kin. This inclusive fitness is what Hamilton suggested could evolve altruistic behaviour. In the Paleolithic age, humans were confined to small groups of closely related kin and their altruistic instincts benefitted not only each other but the whole tribe, which would have been composed of kin, suggesting that evolution of a moral sense might have its origins from kin selection. Nevertheless, altruism still exists in groups of unrelated individuals, which arguably requires an additional model of group selection.

Group selection implies behaviour that is evolved for the good of the group. Indeed, natural selection is based on relative fitness; it only matters how fit you are relative to other individuals. Similarly, a group's fitness is measured relative to another group. Consider once again the shared resource among a tribe of Paleolithic humans. Selection between individuals within the tribe favours cheating behaviour, but selection between tribes within the population favours altruistic behaviours that increase the relative fitness of the whole group. In the case of moral sense, Darwin suggested that altruistic individuals do not have an obvious advantage over 'cheaters' within their own tribe, but whole tribes of individuals with a moral conscience who exhibit altruistic behaviours would out-compete other tribes. This does not necessarily mean that all tribes will evolve a high moral standard, but as the evolutionary biologist Edward Wilson posited, the final outcome depends on the relative strength of within-group selection opposed by between-group selection. Nevertheless, critics of group selection argue that this theory is simply an extrapolation of kin selection, where the degree of relatedness is low, creating confusion over the definition of a group. In principle, group selection can occur; the question is whether it amounts to a significant force in evolution.

The ongoing dispute between theories of natural selection at the group or individual level has led evolutionary biologists to investigate how selective forces can act at multiple levels of biological organization, resulting in the possibility of multiple interactions between groups,

individuals, and genes. One such theory is the multi-level selection theory (MLS), which states that adaptation at one level of biological organization requires a corresponding process of selection at the same level. Furthermore, the strength of selection is predicted to decrease at higher levels of biological organization such that adaptation at any level tends to be undermined by selection at lower levels. Applying this theory, for instance, in the case of Paleolithic humans, possessing a highly developed moral sense might benefit the group as a whole which might evolve over time, but only if group level selection is strong enough to overcome selection of individuals who cheat within the group. That is, moral sense was more adaptive at the group level than the individual fitness advantages associated with amoral behavior.

Following group and kin selection is the gene-centered view of evolution<sup>15</sup>, which MSL theory also acknowledges. Gene selection theory postulates that evolutionary changes are adaptive at the gene level, regardless of where the fitness differences are located in the biological hierarchy. Some manifestations of this theory can be observed in the process of meiosis, in which cells necessary for sexual reproduction are divided. Normally, natural selection is suppressed among genes being separated during meiosis, with genes having an equal chance of being represented in the next generation. However, some genes within meiosis gain an individual advantage through the process of meiotic drive, which involves unequal gene segregation during cell division. As a result, some genes become more numerous relative to others. This is advantageous to the gene but not to the individuals, as these changes can often lead to fatal mutations or infertility, thereby reducing an individual's fitness. Therefore, meiotic drive is an example in which a 'selfish' gene<sup>16</sup> propagates itself for the good of the gene, but not necessarily for the good of the individual or group. This gene selection theory has also attempted to explain the origins of moral sense, or conscience.

According to Richard Dawkins, who expressed this view of the 'selfish' gene, natural selection favours rules that promote the genes that built them. In the Paleolithic age, when humans lived in small groups mainly of close kin and potential reciprocators, altruistic behaviours were programmed into our brain from this genetic basis. He explains, however, that

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<sup>15</sup> Gene selection theory holds the view that evolution occurs through the differential survival of competing genes, increasing the frequency of those genes whose traits promote their own spread. The gene is the unit of selection.

<sup>16</sup> In the Darwinian sense, the units in the hierarchy of life that survive will be the ones that survive at the expense of their rivals at the level of their hierarchy. The selfish gene suggests that the unit of natural selection is the gene, and the effects of this selection can be described as selfish. It does not imply a gene's cognitive awareness (Dawkins, 2006. p.255)

these rules of gene selection sometime misfire. For example, in modern times humans live in large groups, composed of mainly unrelated individuals, yet our altruistic behaviour persists. Dawkins espouses that altruism exists as a Darwinian byproduct independent of its original purpose. That is, despite not fulfilling its ultimate cause of helping close kin individuals, the proximate behaviour, altruism, still exists. This misfiring, Dawkins contends, is purely from a Darwinian position and is not pejorative in reducing altruism or other 'conscious' behaviours to some biological necessity. Dawkins' theory suggests that a moral sense, including conscious behaviours, might be a product of evolution by natural selection, whose proximate characteristics still act, independent of the ultimate genetic cause that shaped it. Likewise, Rubino posits that conscience is an internal sense that humans possess, separate from socially taught values, and that carries a strong genetic component. This gene-centered view of selection suggests that, to some degree, there is a genetic basis for a moral sense, or conscience.

In light of these evolutionary theories, we have now considered the main point upon which, for Darwin, the question of the moral sense hinges: "why should a man feel he ought to obey one instinctive desire rather than another?" (p.87) Darwin himself, though he was normally a staunch advocate of selection at the individual level, proposed group selection when discussing human tribes, through which individuals would act altruistically 'for the good of the group'. Collectively, moral sense would be have been more important among competing whole tribes than within-group selection pressures of non-altruistic individuals. While modern scientific theories of selection have since expanded to include kin and gene selection, these theories, in my view, recognize the multilevel nature of selection. Regardless of the debate, these conscious social behaviours have a genetic component, and in most cases, natural selection likely operates at different levels of biological organization, with increasing selection from the group to the genetic level. Furthermore, the current state of the scientific theory suggests that behaviours which are empirical indicators of conscience, such as altruism and cooperation, can occur in different degrees. However, I posit that these differences in degree of conscience can be explained, in part, by natural selection acting at different levels of biological organization and with varying strength. As a result, we see a 'maturity of conscience' in the differences of certain conscious behaviours, such as altruism, within and among species. In the case of human evolution, our social instincts created the conditions necessary for selection to act at multiple levels and produce a highly developed moral sense or 'mature conscience'.

The evolutionary arguments outlined above present a clearer frame of reference when discussing social behaviours such as altruism and co-operation, which Darwin believed were behaviours associated with moral sense or conscience. The purpose of discussing these theories is to emphasize that current scientific evidence and literature have developed Darwin's original logic into a modern understanding of moral sense, as well as the social instincts, such as altruism, that shape it. While there is no scientific consensus about the level at which natural selection acts to form these conscious behaviours, it is highly probable, in my estimation, that selection acts on different levels of biological organization, from genes to groups, with varying strength. For example, current evolutionary theory understands that kin selection and group selection are not completely distinct processes and that the traditional concepts of group and individual selection are seen as two extremes of a continuum. Nevertheless, no matter which level of biological organization selection acts on, social behaviours, which can indicate conscience or moral sense, have evolved through the process of natural selection.

### **On Art and our Darwinian Nature**

From the evidence presented above, we can begin to understand the evolutionary basis of moral sense in the context of Rubinoff's definition of art and address the central question: "*can art become the fulcrum for the reconciliation of science with history to lever the value of conscience beyond the plasticity of morality?*"<sup>17</sup> If art is an act of will in accord with a mature conscience, and a mature conscience or moral sense is evolutionarily derived, then art is a force, equally credible as science, in the further evolution of human consciousness. As Rubinoff argues, art can then lift the value of conscience 'beyond the plasticity of morality'; that is, evolve conscience so as to return to the profound perception of art. According to Darwin, the moral sense, or conscience, was a positive force that told individuals what was right to do as opposed to what was purely wrong. Likewise, Rubinoff agrees that an artist's existential commitment to conscience is also a positive force. As evolutionary theory demonstrates, humans must have evolved their group consciousness and morals in order to survive, and this evolution of conscience can be achieved through art.

The Chauvet cave, depicting the earliest known cave paintings in the world, is a prime example of this evolution of conscience, in which abilities such as heightened spiritual sense and

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<sup>17</sup> See Rubinoff, 2012. *Existential Realities of Post Agriculture*, p. 4. Plasticity of morality is about rationalization; how individuals form their reality around the rationalizations that exist.

art perception were highly developed. In addition to moral sense, spirituality and art perception are also products of evolutionary forces<sup>18</sup>. Approaching the end of the Paleolithic period, the cave paintings of Altamira and Lascaux display art that is equal in quality to that of the high renaissance, in terms of technique, ability, and perceptions of spirituality. As a result, the evolutionary context of humans at that particular point in time, 36,000 – 16,000 years ago, suggests that the transition into the Neolithic period was also characterized by the evolution of conscience with the advent of war. However, Rubinoff contends that spirituality in the Neolithic age, in the form of religion, rationalized war and evolved human consciousness such that during this period, an artist's existential commitment was to a rationalized conscience<sup>19</sup>.

If artists constitute a force to further evolve human consciousness, then the concept of moral sense, Rubinoff posits, is a way of moving beyond the Neolithic period and the age of agriculture that was defined by perpetual states of war<sup>20</sup>. Nevertheless, it is impossible to advance past that age unless there is a vision beyond it, and moral sense provides this base since it is ultimately about rationality of conscience, in Darwinian evolution, as opposed to rationalization of conscience. Therefore, another concept of spirituality is required, as Rubinoff argues, for art to survive, hence the moral sense. As a consequence, the value of art, through its commitment to 'mature conscience' of moral sense, can allow the evolution of human consciousness beyond the age of agriculture.

### **The Future of Humanity: Implications for Transgenic Engineering**

As the evolutionary origins of moral sense are uncovered, we begin to understand its implications for existential realities of the artist. One such existential reality is transgenic engineering<sup>21</sup>. In the age of post-agriculture<sup>22</sup>, the artist must ask what it means to be human. With the prospect of transgenic engineering, our humanness cannot be assumed and a conversation in defense of the genome must take place at the first stage.

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<sup>18</sup> See Lawless, 2012. p. 6-7.

<sup>19</sup> Rationalization concerns the attempt to explain or justify with falsely assumed logical reasons. Rubinoff argues that the age of agriculture was about the rationalization of conscience, rather than the rationality of conscience. The rationality of moral sense or conscience is based on sound scientific reason and logic of evolutionary theory.

<sup>20</sup> It is unclear whether agriculture created warfare or if warfare created agriculture.

<sup>21</sup> Transgenic engineering refers to an organism that contains genetic material into which DNA from an unrelated organism has been artificially introduced.

<sup>22</sup> Rubinoff argues that one characteristic of the age of post-agriculture is the reality of transgenic engineering.

Fundamentally, transgenic engineering is a massive experiment. We have no idea what the long-term consequences of these genetic manipulations will be for each genetic combination and permutation. However, there is growing evidence to suggest that there are, indeed, very likely significant threats from transgenic organisms. For example, the genetically modified ‘AquAdvantage’ salmon, which combines genes from Atlantic and Pacific Chinook salmon with those of an eel, has been engineered such that its hormones allow it to grow year-round, thereby increasing fish stock yields and producing more food<sup>23</sup>. However, there have been many significant concerns about this transgenic organism including its entirely different feeding behaviour, ability to survive in new habitats making it a likely invasive species, and its loss of prey instincts. As a result, this transgenic fish has been restricted to live only in controlled fish tanks because of the high risk of it out-competing wild salmon and hybridizing with other salmon species, both effects resulting in a loss of species genetic diversity. This reduction in diversity and variation is what has already been observed in genetically modified plants, creating further concern that genetically engineering humans will also lead to lower genetic variation.

While it has taken 3.5 billion years to create the genetic diversity to which humans now bear witness, the biggest danger of transgenic engineering, in the case of humans, is the elimination of variation and diversity. In essence, Darwinism is the protection of diversity because evolutionary potential is stronger with greater variation upon which natural selection can act. In the case of moral sense, which is evolutionarily derived and inherited, the variation or degree of conscience refers to maturity of conscience, and therefore, as curator Karun Koernig argues “art done with the highest evolutionary potential is done with the most mature conscience”<sup>24</sup>. However, with a possible reduction in diversity, there will be a significantly smaller human gene base upon which selection can act which would also reduce the variation of behaviours such as moral sense and conscience, which are genetically derived. I suggest that this would not only have significant impacts on what constitutes ‘humanness’ but also on what constitutes a ‘mature conscience’ in art.

From a scientific perspective, genetics follows the inheritance of genes in a vertical fashion, from parent to offspring of the same species. However, transgenic engineering and biotechnology allow genes to be moved from one organism horizontally into a totally unrelated species, without regard to the biological constraint that would normally be present in nature.

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<sup>23</sup> See Smith et al, 2010.

<sup>24</sup> Koernig, 2009. *The Inherent Value of Art at the End of the Age of Agriculture*, p. 15.



Moving a gene from one organism to another species completely changes its evolutionary context and history. In effect, the logic supporting transgenic engineering is flawed science since we assume that the principles governing the inheritance of genes vertically within species apply when genes are moved horizontally between different species. However, there is no evidence to make this conclusion, and the evidence required to do so would have to be collected over hundreds, if not thousands of years, since evolution occurs over such long time scales. As a result, it is unfeasible for health authorities, courts, and scientists to test all possible permutations of transgenic alterations over a large enough population over time to say with assurance that transgenic species are harmless, in spite of any ethical questions of what is human what is not. Currently, these ethical considerations of transgenic engineering are largely based on the technology and not based on the science<sup>25</sup>. Rubinoff argues that as a result, by the time ethics of transgenic engineering is based on science, in this case Darwinian evolution, there will be little effect since industry and governments have already invested heavily in the technology making it increasingly difficult to control<sup>26</sup>.

Nevertheless, as transgenic engineering technology develops, there is the possibility that it will eliminate parts of the gene pool that are absolutely necessary for adapting to changing environments. From a Darwinian perspective, we do not want to alter the genome in such a way that results in the elimination of the diversity, or the degree of conscience in humans that has already taken 2.5 million years to produce. In the case of transgenic food, we were never given the choice as the ethics were based on the technology and not the science. However, with transgenic engineering of humans we have the opportunity to at least act, which is where Rubinoff suggests that art can play a vital role in evolving this human consciousness.

If the reduction of diversity and variation of traits such as moral sense is a possible unintended consequence of transgenic engineering in humans, then what might the intended consequences be if scientists actively modify genes responsible for social behaviours? Will transgenic humans lose certain instincts? Which ones? How will this affect our moral sense or conscience? What will be the divisions of our humanity? Questions such as these are most difficult to answer, but Rubinoff argues that first, a strong ethical code must address the lag

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<sup>25</sup> Rubinoff posits that by the time science anticipates the consequences of transgenic engineering, the technology already has an impetus of its own and has already been rationalized within the law independent of ethical arguments based on Darwinian science.

<sup>26</sup> In this case, Rubinoff argues, there is nothing more rationalized than progressing with a technology before examining or anticipating the consequences of it.

between the science and technology. As a consequence, art can be the fulcrum to evolve human consciousness beyond the ‘plasticity of morality’ and the inherent rationalizations of transgenic engineering.

## **Conclusion**

Humans are bound far more by natural history than by our cultural history. As a result, art as “an act of will in accord with a mature conscience” must integrate natural history into its definition to further understand the existential commitment of the artist to ‘mature conscience’. Darwin suggests that this conscience or moral sense has been shaped by evolutionary forces, and argues that individual acts of conscience, such as altruism and co-operation, are highly valuable to social groups, especially during periods of transformation in which individuals have to articulate new sets of human values, or new configurations of existing human values. From scientific evidence presented above, I also argue that individuals who can perceive and act in accord with this sense of conscience are of great adaptive value. While evolutionary theorists still debate the principal mechanism through which natural selection acts to produce conscious behaviours, it is clear that a moral sense, or ‘mature conscience, has its roots in evolutionary science. Therefore, moral sense is a necessary condition of a mature conscience, as evidenced by social behaviours that indicate a level or ‘maturity of conscience’. The acceptance of natural history as history itself does not reduce conscience or artistic expression to biological determinism. It simply illustrates that conscience is present in all societies and that it is genetic in origin. The fact that science on its own cannot answer questions of human soul and spirituality impels art to become the fulcrum that evolves human consciousness. Consequently, the artist’s commitment to ‘mature conscience’ compels art to address existential realities of our time, such as transgenic engineering, with the aim of evolving human consciousness in favour of the protection of diversity. Ultimately, by placing these evolutionary narratives alongside the insights of Jeffrey Rubinoff, we can begin to see that Darwin’s concept of moral sense or conscience has considerable weight in reframing the role of the artist in society, and reaffirming the value of art.

## References

- Dawkins, Richard. *The Selfish Gene*. 1<sup>st</sup> ed. Oxford: Oxford University Press, 1976. Print.
- Dawkins, Richard. *The God Delusion*. 1st ed. London: Transworld Publishers, 2006. Print.
- Darwin, Charles. *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. 1st ed. London: John Murray, 1859. 130-173. Print.
- Darwin, Charles. *The Descent of Man, and Selection in Relation to Sex*. 1st ed. London: John Murray, 1871. 97-126. Print.
- Foster, Kevin, Wenseleers, Tom, and Ratnieks, Francis. "Kin Selection is the Key to Altruism." *Trends in Ecology and Evolution*. 21.2. (2006): 57-60. Print
- Gould, Stephen. "Kropotkin was no crackpot." *Natural History*. 106. (1997): 12-21. Print.
- Hamilton, William. "The Genetical Evolution of Social Behaviour." *Journal of Theoretical Biological*. 7. (1964): 1-16. Print.
- Janson, H.W. *History of Art*. Japan: Harry N. Abrams Inc. 17.1. (1993): 18-21. Print.
- Jasanoff, Sheila. *Reframing Rights: Bioconstitutionalism in the Genetic Age*. Cambridge, MA: The MIT Press, 2011. Print.
- Koernig, Karun. "The Inherent Value of Art at the End of the Age of Agriculture." *Jeffrey Rubinoff Sculpture Park*. (2009): 1-24. Web.  
<http://www.rubinoffsculpturepark.org/coi/KoernigEssay2009.pdf>
- Kropotkin, Petr. *Mutual Aid: A Factor of Evolution*. 1<sup>st</sup> ed. Harmondsworth: Penguin Books Limited, 1939. Print.
- Lawless, David. "On the Evolutionary Origin of Artistic Development in the Chauvet Cave Paintings." *Jeffrey Rubinoff Sculpture Park*. (2012): 1-11. Web.  
<http://www.rubinoffsculpturepark.org/coi/2012Lawless.pdf>
- Richards, Robert. "A Defense of Evolutionary Ethics." *Biology & Philosophy*. 1. (1986): 265-293. Print.
- Rubinoff, Jeffrey. "The Insights that Evolved With and From the Work of Jeffrey Rubinoff." *Jeffrey Rubinoff Sculpture Park*. 2008: 1-4. Web.  
[http://www.rubinoffsculpturepark.org/coi/2011\\_Insights.pdf](http://www.rubinoffsculpturepark.org/coi/2011_Insights.pdf)
- Rubinoff, Jeffrey. "Existential Realities of Post Agriculture." *Jeffrey Rubinoff Sculpture Park*. 2012: 1-35. Web.

[http://www.rubinoffsculpturepark.org/commentary/Rubinoff\\_Existential%20Realities\\_of\\_Post\\_Agriculture.pdf](http://www.rubinoffsculpturepark.org/commentary/Rubinoff_Existential%20Realities_of_Post_Agriculture.pdf)

Smith, Martin, Frank Asche, Atle Guttormsen, and Jonathan Wiener. "Genetically Modified Salmon and Full Impact Assessment." *Science*. 330. (2010): 1052-1053. Print.

Thomspon, Nicholas. "Shifting the Natural Selection Metaphor to the Group Level." *Behavior and Philosophy*. 28. (2000): 83-101. Print.

Wilson, David. "A Theory of Group Selection." *Proceedings from the National Academy of Science*. 72.1 (1975): 143-146. Print.

Wilson, David, and Edward Wilson. "Evolution 'for the Good of the Group'." *American Scientist*. 96. (2008): 380-389. Print.