

Ethical Naturalism: A Normative Analysis

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Abstract

An attempt is made to build a coherent naturalistic ethic based upon rational considerations of the context of human existence. The nature of this context is counter-intuitive and is elucidated by using our scientific knowledge of the natural world. The central conclusions drawn from this analysis are that our ethical considerations must be based upon the shared identity we have with all living entities and that these considerations must be arrived at by using rational thought. With this basis for a naturalistic ethic established, the implications of this view for our ethical norms is then explored.

Key words

Rationalism, Epistemic values, Naturalism, Ethical Naturalism

Part One: Ultimate Goals

Introduction

It is my purpose in Part One to show that a moral foundation can be built from the following concepts that will provide an ethical relationship not only with each other but with all of life's forms. Sections One through Three are devoted to the logical justification of the moral premise that "the fundamental purpose of a naturalistic ethic must be to promote biological continuity". Once this premise is established, I continue in Section Four to show how it is redefined by the current state of our scientific knowledge.

Section One: Doubt & Reason

Proposition 1: Realism & Rationalism

I accept the following assumptions because they are supported by our ability to manipulate external reality.

A) "Qualified" Realism—There is a world of reality that exists apart from the internal existence of the mind ¹. The qualification refers to Proposition 4, Part C.

B) Rationalism—External reality is accessible to us through our ability to analyze causal relationships; our ability to reason.

Proposition 2: Doubt

To the assumptions of my first proposition must be added the concept of doubt. It is the nature of doubt to have a Janus face. On one side is our desire to understand causality, our questioning mind. On the other is the fear of our inability to do so, our doubt. I submit that it is the combination of doubt and reason that is necessary for this inquiry. Rationalism is the necessary precondition. Doubt, reasoned doubt, is a consequence of our desire to reliably know our world. *We must want to know, and we must accept rationalism as our fundamental epistemological prescription* ².

Proposition 3: Epistemic Values ³

Once we accept rationalism, there follows a logical set of *prescriptive epistemological principles*. The underlying logic structure for each of them is in the analysis of causality. They include, but are not limited to:

- 1) Only those claims to knowledge where the underlying physical causes of a phenomenon have been shown can be accepted. This requirement that the cause and effect mechanism that produces a phenomenon must be demonstrated is called **skepticism**. Methodological skepticism requires that all underlying assumptions of a claim to knowledge be identified and their validity questioned.
- 2) Only knowledge claims based upon **physical evidence** can be accepted. The corollary of this is that all knowledge claims based upon authority alone must be rejected. Personal beliefs do not support claims to knowledge.
- 3) **Prediction** by itself is insufficient to support knowledge claims. Correlation by itself fails to link cause to effect. What is needed is an understanding of the mechanism by which a given phenomenon is produced. This is reflected by the value placed on skepticism. But if prediction is combined with a **coherence** to the sum of our reliable knowledge of the physical world, successful prediction can support claims to knowledge.
- 4) **Coherence** is the logical connections between the elements of a set of concepts and facts; the degree of coherence that a set of concepts and facts has is a measure of its internal, logical consistency. All accepted concepts and facts must be coherent with all other accepted facts and concepts; they must be both internally and externally, logically consistent.
- 5) **Consilience**, as a property of explanatory theories, increases the reliability of claims to knowledge. The degree that a theory has consilience is a measure of its ability to explain and unify many separate and seemingly unrelated areas of study. Consilience presupposes the unity of knowledge that follows from the assumptions of realism. That is, if there is only one real world, then all true knowledge will be coherent and contribute to understanding that world (see Appendix One).

Skepticism is the requirement that the causal structure of a knowledge claim be demonstrated. In which case, logic demands a *prescriptive skeptical epistemology*. Prescriptive skeptical epistemology provides us with rules for determining acceptable evidence. With these rules we may go on to descriptive epistemology.

Proposition 4: Epistemic Observations

I submit that the pivotal observations from descriptive epistemology are:

- A) Human beings are inherently prone to self-delusion.
- B) Human beings are intrinsically limited in their ability to perceive external reality. This observation leads to the complete rejection of "naive realism" or "the dogged assumption that the human sensory apparatus accurately records the one and only real world, of which the human brain can make but one accurate model." (Ferris, 1992).
- C) The human mind has contact with external reality only through the lens of our beliefs and theories. This is the "qualification" that must be added to traditional realism. The rejection of naive realism does not mean the rejection of a concrete reality apart from our mental existence. The "qualification" is that we experience external reality only through the mediation of our mental images of reality ⁴.

One feature shared by these observations is that they reinforce our confidence in the utility of prescriptive skeptical epistemology. It is also clear that to rationally come to terms with external reality we must work toward tracking that reality as closely as our mental ability to model it will allow.

With this combination of prescriptive rules and descriptive observations we can now define what can be considered as *reliable knowledge*. Reliable is the common sense, pragmatic standard about the usefulness of our knowledge claims that we must accept because of the limitations of our ability to perceive external reality. The best we can hope for is a contingent correspondence between our knowledge claims and reality itself.

Proposition 5: The Rejection of Spiritualism

The mental model of reality that holds that there is a non-material "spiritual" realm is not, by definition, open to investigation by physical means. Therefore, given the observations from descriptive epistemology and the rules of evidence from prescriptive skeptical epistemology, we must conclude that the notion of spiritualism can not be defended from our inherent tendency toward self-delusion. As a result, notions about a spiritual realm can not contain reliable information about our world.

Proposition 6: The Acceptability of Naturalism

Propositions 1 through 5 are a part of the epistemological foundation of naturalism. Thus naturalism, as a systematic philosophy, rejects any belief in a supernatural realm on epistemological grounds as being intrinsically unknowable and, therefore, prey to the human tendency of self-delusion. In the simplest of terms, naturalism is a view of the world that rejects superstition. The philosophical definition of naturalism in Webster's dictionary states that: "[naturalism is] the view of the world which takes account only of natural elements and forces, excluding the supernatural or spiritual" (Webster's, 1989). The importance of this simple statement cannot be over-estimated, for it delineates one of the basic schisms in our modern world. That schism is the irreconcilable gulf between a belief in spiritualism and its rejection. I submit that naturalism currently contains the most logically acceptable framework of concepts for modeling reality.

Proposition 7: The Rational Justification of Ethics

With the acceptance of naturalism as the most logically acceptable framework for our mental model of reality, we are forced to accept that ethical naturalism may derive ethical principles for our behavior only from observations of the natural world. This is the obvious result of rejecting a supernatural realm to reality. Thus in the sense of *a priori* first principles the "metaphysics of naturalism" is an oxymoron. With the rejection of spiritualism the term metaphysics becomes problematic in that it is awkward to speak about what is "beyond" the material world if all you accept is the physical world. Traditional metaphysics from the viewpoint of naturalism is then important in the negative sense of describing what naturalism does not possess. *The central implication of this is that we must either base our ethical system on factual observations of the natural world or ethics can not be rationally justified.*

Proposition 8: The Rejection of Teleology

There is a second part to Webster's philosophical definition of naturalism: "[naturalism accepts] the belief that all phenomena are covered by laws of science and that all teleological explanations are therefore without value" (Webster's, 1989). The phrase "the meaning of life" has always been a corruption of the question "what is the *purpose* of life?". When "purpose" is used instead of "meaning" then Webster's reference to "teleological explanations" becomes clear. Naturalism's rejection of teleological explanations is the rejection of purpose in the natural world. I will go further and state simply that from the viewpoint of naturalism, purpose is a human invention which, without logical justification, we try to impose upon the natural world. For naturalism it is nonsensical to ask the question "what is the purpose of life?". Life is in a category of things that intrinsically have no purpose. Only we humans with our cognitive ability to project cause and effect into the future have purpose. We create a desired future in our minds whose realization then becomes the purpose of our behavior.

Proposition 9: The Rejection of Existentialism

Our choice of purpose need not be arbitrary.

Clarification #1) The statement from Proposition 8, that "[naturalism accepts] the belief that all phenomena are covered by laws of science" is misleading. The only "belief" that naturalism accepts is that a rational, skeptical, prescriptive epistemology is the best method we have to arrive at reliable knowledge about external reality, nothing more. As a result, naturalism does not accept knowledge claims made in the name of science uncritically. They, like all knowledge claims, must meet the requirements of skeptical epistemology. What causes the confusion is that science and naturalism accept the same prescriptive epistemology, but the goals of the two endeavors are different. *Science is committed to the production of reliable knowledge, whereas naturalism is committed to using only reliable knowledge in addressing philosophical questions.* This explains the relationship between the scientific study of ourselves or descriptive ontology and naturalistic ontology, and shows it to be an obligate relationship.

Section Two: Freedom of Action

Proposition 10: A Definition of Ethical Behavior

I define ethical behavior as social behavior that is modified by rational considerations in the present *to achieve shared goals in the future*. Ethical behavior is rational, mutually end-directed social behavior.

Proposition 11: The Freedom to Act

To concern ourselves with ethical considerations we must have the freedom to act upon those considerations. Corollary—if we have no choice about our behavior, social or not, it can not be considered ethical.

Proposition 12: Emotional Hedonism

In the absence of rational thought our behaviors are motivated by emotional hedonism; that which makes us feel emotionally good. Emotional hedonism is controlled by physiological mechanisms that are in place as a result of natural selection. The reason that behaviors driven by emotional hedonism exist is that they contribute to the imperative of biological continuity. Emotional hedonism is the automatic pilot that nature has put in place to make sure there is a next generation. Emotional hedonism can give rise to egoism or self-love, but is also responsible for nurturing behaviors, kinship

selection, and reciprocal altruism, in other words, all of the "moral sentiments" (Ruse, 1986; Hume, 1739). But what feels good is not always good for us. *Freedom of action requires rational thought in order to free us from the default motivations of emotional hedonism.* Our actions are not free if they are controlled by our hormones and our hormones do not always know best.

Proposition 13: Prescriptive Self-value

Freedom of action requires the physical maintenance of self in order that we may be able to act. Therefore, we are forced by circumstances to both maintain our physical selves and to use rational thought in order to have the freedom of action that is required to act ethically. It follows then that in order for us to concern ourselves with ethical considerations *we are rationally forced to value our biological selves.* This can be viewed as *prescriptive self-value.* Emotional hedonism also appears to give rise to self-value in the form of egoism, but, because it is in place as a result of natural selection, it must be viewed as descriptive self-value.

Section Three: Prescriptive Ontology

We are logically forced to value what we are, if we wish to be ethical. This is why what we think we are is crucial.

Proposition 14: Natural selection selects only for biological continuity.

To rationally maintain our biological selves, we are forced to respond to those needs that natural selection has put in place to maintain biological continuity. I use the phrase "to rationally maintain" to convey that we may either promote or suppress these needs based upon whether or not they further our ethical goals.

Proposition 15: The Prescriptive Limit

The logical limit to our freedom in responding to our biological needs, no matter what our ethical goals, is the point where, if we fail to provide for certain needs, we will destroy our biological selves. I submit these certain needs, which can be identified by descriptive ontology, become, themselves, ethically prescriptive. This is the *prescriptive limit* or the point up to which the "is" of our biology must also be the "ought" of our ethics (Moore, 1903). Everything from our most basic need up to this point is needed to maintain our biological selves and is, therefore, prescriptive. We are forced by the "context [of our existence] that can not be escaped" to provide those things that living demands (Gewirth in Richards, 1987, 621). *We should because we must* provide for these needs if we wish to be ethical.

Proposition 16: The Universal Core Identity

Those needs up to this prescriptive limit define the *universal core identity of our biological selves*. The central fact of this core identity is that it has been "designed" by the process of natural selection solely for the function of supplying biological continuity. We can better understand what this means by using Richard Dawkins' metaphor of the blind watchmaker (Dawkins, 1986). In the metaphor the blind watchmaker is natural selection. The metaphorical watch is our biological selves. And just as a watch is designed to provide accurate time, we are "designed" to provide organic continuity. The physical watch and its design derive their importance from the importance of accurate time. In the same fashion the importance of our biological selves derives its importance from biological continuity. Therefore, just as the ultimate value of a watch is the value of accurate time, the ultimate value of our biological selves is biological continuity. To be ethical we are forced to value the prescriptive core of our biological selves. Therefore, to be ethical we must hold biological continuity to be of ultimate importance. To act ethically based on our values is to promote them, and to promote is to have purpose. It follows then that the fundamental purpose of a naturalistic ethic must be *to promote biological continuity*.

Section Four: Naturalistic Ontology

As science produces new, reliable knowledge about ourselves, naturalism is committed to integrating that knowledge into a coherent picture of who and what we are. These portraits of ourselves can be described as our *theories of self*. It then becomes the central purpose of ethical naturalism to define what are the implications of these theories of self for our ethical behavior.

Proposition 17: The nature of organic being is counter-intuitive.

Biological continuity is the product of *a single, ongoing, genetically controlled chemical chain reaction*. All of the life-forms that exist today are the current manifestations of this genetically controlled chemical chain reaction. They exist as temporal dissipative structures of this dynamic non-linear phenomenon (see Appendix Two). These temporal manifestations cannot continue to exist without a constant flow of energy and matter into and out of this system. As a result, they are unstable and exist only far from energy equilibrium. This is in contrast to inanimate objects that remain unchanged if not acted upon by external matter or energy. Objects are stable and exist at or near energy equilibrium. An essence is that about an entity that is unchanging. Therefore, because it is constantly changing, there can be no intrinsic essential character to temporal manifestations of a non-linear dynamic system. Temporal manifestations can have no essence in themselves. Therefore, it is a mistake of logic to reify any portion of a dynamic system into an essentialistic object. It is a characteristic of human cognition to reify dynamic phenomena, but to understand organic being we must resist doing so. As life-forms, the nature of our existence is as a temporal manifestation of this dynamic

phenomenon we call life; this is our being. We cannot exist as unchanging objects apart from this phenomenon. Therefore, we can not separate our identity from that of the phenomenon. Our identity can not be separated from that of all of life on Earth. I submit, that in the light of these considerations, there is no logically defensible ontological boundary to our organic being except that between the biotic and the abiotic. *Therefore, life on Earth must be considered as a single ontological being.* It follows from this, as a logical extension of prescriptive self-value, that our fundamental rational aim must be to help all of life on Earth to flourish.

Proposition 18: Measuring Life

Whether life on Earth is flourishing can be measured by the use of two parameters, sheer living biomass and genetic diversity. Sheer living biomass measures only the quantity of life. Genetic diversity, as a surrogate measure of life's ability to cope with change, is a measure of the quality of life's well-being. Both measures are relative to the level of each found throughout the history of life. One can say life is flourishing if both the sheer amount of living biomass and the level of genetic diversity present are greater relative to the amount of each found throughout the history of life on Earth.

Proposition 19: Biological continuity can not be assumed.

Clarification #2) In Proposition 10, I refer to shared future goals. But for how long into the future are these ethical goals projected: a week, years, or hundreds of years? The answer to this question lies in the relationship between the individual and the population. In Proposition 16, I show that we must value biological continuity if we wish to be ethical. But am I referring to the continuity of myself or that of the population I am a part of? By population, I mean a population of interbreeding organisms that is large enough to sustain itself indefinitely through time. There are few certainties left to us in the modern world, but one of them is that all of us will die. Given this fact, if we wish to share ethical goals that can only be realized over a time span that is longer than the human life span, then what continuity are we concerned with? It surely can not be that of the individual. In Proposition 17, I present the intrinsically temporal nature of individual organisms in contrast to the enduring nature of populations of organisms, indeed of all of life. So if we are to concern ourselves with ethical goals that require more time than the human life span, we are, out of logical necessity, concerned with the continuity not of ourselves but of populations. In Proposition 16, my goal was to show that to be ethical we must concern ourselves with the biological continuity of human populations. In Proposition 17, my goal was to show that to be ethical we must concern ourselves with the biological continuity of all of life.

I must also point out that ethical has no meaning without social. Ethical behavior in ethical naturalism can only be behavior between individuals. Out of biological

necessity this means behavior between individuals that do not share the same chronological life span. The very young and the very old are the extremes of this reality. The very old, as moral agents, have ethical obligations to the very young as moral subjects. But the life span of the very old will not completely overlap that of the very young, therefore, again, out of logical necessity, to be ethical means to share goals that transcend the life span of individuals. The ethical goal of biological continuity is one, if not the only ethical goal, that can be shared by all the members of a population.

Clarification #3) Propositions 16 and 17 present a new ontological frame of reference for understanding our biological being. This new frame of reference for our theories of self reflects the basic conceptual shift from an essentialistic worldview to a naturalistic worldview. With this shift all moral value has passed from the individual immortal soul of essentialism to naturalism's ontological view of life as a single being ⁵. To achieve this shift entails a concerted effort to rid our thinking of the last vestiges of Platonic essentialism and its attendant spiritualism. It also entails adopting what Daniel C. Dennett has called "uncompromising 'no-skyhooks-allowed' Darwinism" or the view "that all the fruits of evolution can be explained as the product of an algorithmic process", including the human mind (Dennett, 1995).

This new frame of reference is also based on what can be called a *strong version of the theory of common descent* (see Mayr, 1982). This version of Darwin's theory views life at the molecular, genetic level from the perspective of non-linear thermodynamic systems. It is from this perspective that I derive that life is "a single, ongoing, genetically controlled chemical chain reaction". This view also takes Richard Dawkins' image of the selfish gene and refines it by eliminating the reification of the dynamic nature of life's chemistry into an object called a "gene" (Dawkins, 1989). This is one result of the consistent refusal to reify dynamic phenomena which follows from the complete rejection of essentialist thinking. This change in perspective is also an attempt to achieve what David Hull has advised: "[that] we have to conceptualize the relevant [biological] entities in ways appropriate to the evolutionary process even at the expense of ordinary perceptions." (Hull in Callebaut. 1993, 283). I submit that viewing life on earth as a single ontological being is the perspective that will allow us to define a rationally justified naturalistic ethic. This perspective can be called the *unity of life* (see Appendix Three).

Part Two: Mediational Ethics

"A scientific mediational normative ethics uses knowledge about the world and man to recommend optimal human behavior for the implementation of assumed ultimate goals". "The quest is for *intermediate* ethical rules for implementation of [these] previously chosen ultimate values." (Campbell, 1979).

Introduction

The assumed ultimate goal that I have proposed in Part One is biological continuity. But as I have pointed out in Proposition 19, we cannot assume biological continuity. The ongoing survival of a population of organisms is not guaranteed nor even probable. And yet, as I've tried to show, the survival of humanity, if not that of all life-forms, is the fundamental source of all moral value. Can we then, as rational beings, *assume* that innate behavioral dispositions are sufficient to insure the survival of our population? This especially given that those instinctual dispositions are in place because of past rather than current conditions. It is obviously irrational to put our fate in the hands of our moral sentiments. And yet, those moral sentiments are in place to serve the same end as reason concludes, the goal of biological continuity. *But evolution by natural selection does not lead to optimal adaptations.* It produces only historically contingent and temporally constrained answers to past questions. What worked in the past was cobbled together from what was available and has no guarantee of working in the future. Evolutionary adaptations are always a gamble that future conditions will be similar to the past. There is, however, one certainty given the rate of change in our modern world. It is that our future, if not already the present, will bear little resemblance to our adapted past. We must now use our cognitive capacity for reasoning to transcend our genetically determined behavioral dispositions, even if we find them morally admirable ⁶. This we must do if we are to find ethical answers to the problems caused by those very same genetic dispositions.

Section One: The Division of Ethics

The structure that I have used to define ethical naturalism is from Donald T. Campbell as outlined in Appendix Four and from his paper *Comments on the Sociobiology of Ethics and Moralizing* (Campbell, 1979).

In addition, I submit that the primary division of ethics should be into:

- A) the study of the ethical relationships between *moral entities*; and
- B) the study of the sources of motivation for ethical behavior.

Ethical relationships can be further subdivided into:

- 1) the ethical relationships within a self identified group;
- 2) the ethical relationships between autonomous groups; and
- 3) the ethical relationships between humans and other life-forms.

The sources of motivation for ethical behavior fall into only two categories:

- 1) "ethical" behavior motivated by the innate "moral sentiments"; and
- 2) ethical behavior motivated by rational thought.

Rational motivations can be further divided into:

- a) those guided by absolute categorical imperatives; and
- b) those guided by contingent assumed ultimate goals.

These subdivisions are in addition to the division of ethics between an empirical discipline (descriptive ethics), and a normative discipline (prescriptive ethics) [see Propositions 1-4].

Section Two: Moral Entities & Obligations

Proposition 20: Moral Subjects

I submit that, because of the continuous nature of our being—the unity of life, all living entities are *moral subjects* (see Proposition 17). As such, all moral agents have moral obligations to all living entities.

Proposition 21: Moral Agents

I define *moral agents* as those living entities that, because they have the capacity for rational thought, are independently able to identify and discharge moral obligations to moral subjects⁷. Therefore, until we discover rational life-forms other than human beings, only human beings can be moral agents (see Propositions 10-13).

Proposition 22: Moral Followers

Because of the observations from descriptive epistemology, a third category of moral entity can be identified (see Proposition 4). *Moral followers* are those human beings that are unable to independently identify moral obligations toward moral subjects, but are able to control their own behavior to the extent they are able to follow moral rules established by moral agents.

From this viewpoint there are four classes of moral entities: non-moral objects—the class of all inanimate objects; moral subjects—all living entities; moral followers; and moral agents. What divides living things into three moral classes is the ability of some human beings to discharge moral obligations toward moral subjects and the ability of other humans to follow received moral direction.

To be a moral agent you must be aware of the causal relationship between behavior and goals. As moral behavior is purposeful, end-directed behavior, a moral agent must understand the end toward which their behavior is modified to achieve. This

awareness is a knowledge based, rational state of consciousness. A new-born child has no knowledge of the world and, therefore, cannot be a moral agent. An individual that is insane is incapable of rational thought and, therefore, can not be a moral agent. Both the new-born and the insane are moral subjects by virtue of their being alive, but they are incapable of identifying and discharging moral obligations to other moral subjects. Moral agents must be able to identify those moral subjects toward whom they have moral obligations and the obligations they have toward them. This requires rational thought.

The last category of moral entity, that of moral followers, represents the juvenile state of moral behavior. It is that category of individuals that are able to control their behavior to the extent that they can follow a proscribed set of rules given to them by moral agents. The crucial difference is that moral followers, as opposed to moral agents, are unable to make moral decisions about novel moral problems not covered by the code of behavior in which they have been indoctrinated. Being a moral agent requires an individual to be rationally self-autonomous. Being a moral follower requires only that individuals be indoctrinated into a moral code of behavior during their primary socialization. Young children go through this process and are expected to be able to control their behavior morally sometime after early childhood. In our society it is accepted that this indoctrination process should be completed by the age of eighteen. I submit, however, that very few eighteen-year-olds, as well as very few adults, have sufficient knowledge of our world and are sufficiently rational, self-autonomous thinkers to be moral agents. Most adults, most of their lives, are able only to be moral followers, and many are incapable of even this.

The reality of the existence of moral followers sets one of the fundamental limits on all ethical systems. History has proven repeatedly that human beings cannot be asked to do that which runs contrary to the core of human nature. You can not ask the majority to abstain from sexual intercourse. It simply is impossible for most humans to over-ride the automatic pilot of emotional hedonism. Some moral agents through heroic effort may be able, some of the time, to exert enough self control to go against what natural selection has programmed us to do. But under no circumstances can we expect moral followers to do so on a sustained basis. The result is that ethical systems must be designed to account for, rather than frustrate, our hardwired instincts if we are to expect moral followers to be able to accommodate an ethical code of behavior. As Peter Singer puts it: "Human nature is not free flowing, but its course is not eternally fixed. It cannot flow uphill, but its direction can be altered if we make use of its inherent features instead of fighting against them." (Singer, 1981).

Implicit in this view is that we must apply rational thought in an effort to control our programmed nature so that we may solve those problems that lie outside of the capacity of that program to solve. We must transcend our biological selves if we hope to solve the very problems our biological nature has created. Over-population, human caused mass extinction of species, environment degradation, all have come about because of our biological nature. The solutions cannot come from our moral sentiments or moral intuition. Rational thought is our only hope for solving these problems, problems that

threaten our survival. Thus, it is in the nature of the problems we face that the choice between a Kantian as opposed to an evolutionary ethic becomes clear ⁸.

Also implicit in this view is that ethics should not be held hostage by the limitations of moral followers. We must always be testing the limits of human behavioral plasticity if we hope to achieve our rational ethical goals. Moral followers are obligated to follow moral rules given to them by moral agents until they can demonstrate their ability to independently apply moral understanding. The reciprocal of this is that moral agents are obliged to encourage moral followers to become moral agents. But we can not assume, based on such criteria as age, education, or economic status that an individual is capable of being a moral agent.

Proposition 23: Freedom of Action & Control

Moral responsibility can arise only when there is freedom of action and the ability to control the outcome of relevant events (see Propositions 10-13).

There are two aspects in assessing moral obligation. The first is that we must be free to act upon our ethical considerations (from Proposition 11). The second is that our actions must be able to change the course of events to achieve our ethical goals. We must be able to control the outcome of events to have moral responsibility. No moral entity can logically be held responsible for anything that is beyond their control. Thus, *control* is the logical first principle for determining moral responsibility.

The most significant change in our world in the last four hundred years is that science and technology have immensely extended our control over natural events. This extension of control has extended our moral obligations in directions undreamed of by our ancestors. It is the fundamental task of our age to analyze and come to understand how this extension of control over the natural world has changed our moral obligations.

Proposition 24: Nietzsche's Dictum

"What alone can *our* teaching be?—That no one *gives* a human being his qualities: not God, not society, not his parents or ancestors, not *he himself*. *No one* is accountable for existing at all, or for being constituted as he is, or for living in the circumstances and surroundings in which he lives. The fatality of his nature cannot be disentangled from the fatality of all that which has been and will be."

From Frederick Nietzsche's, *Twilight of the Idols*, section 8, "The Four Great Errors" (in Hollingdale, 1977, 211-212). This quote inspired the following concept. It is therefore appropriate to name it:

Nietzsche's Dictum—Because no living entity had control over their conception and birth, no living entity is morally responsible for their existence nor for how they are genetically constituted.

Section Three: Ethical Relationships Within Self Identified Groups

There are three sets of relationships that operate within self identified groups: those between individuals; those from the individual toward the group; and the reverse relationship of the group toward the individual. All three of these ethical relationships must be addressed if an ethic is to provide for a stable society.

In this section I will present a revision of the Kantian concept of rational ethical necessity. As living organisms we have been designed by a process that has no goal, no ethical desired end point. As Michael Ruse has shown, there is nothing progressive about the process of evolution (see Ruse, 1996). Natural selection does not exist as an all wise directing hand moving organic evolution onward toward perfection. But none-the-less we find ourselves, for better or worse, capable of rational thought. Immanuel Kant understood that the implication of this is that the logic of our circumstances as social organisms would force upon us rational rules for our conduct. The revision of Kant's understanding is expressed in the notion of *reciprocity* or what Peter Singer calls "the principle of equal consideration of the interests of all." (Singer, 1981, 151).

Proposition 25: Sustainable Behaviors and Game Theory

Ethical cooperation between *rational like-kinds* must be based on the logical principle of reciprocity. Every rational individual must logically assume that the desires they have are the same as others like themselves. A logical restriction on reciprocity, however, is that only those desires of the individual members of a group *that are sustainable* can be taken into ethical account. Thus reciprocity concerns only those desires that can be indefinitely shared by all of the individuals of a group. It is conceivable that all the members of a group would desire to steal from the other members, but if they also desire not to be stolen from, then the only sustainable desire they can share is the desire not to be stolen from. *I submit that ethical behaviors are strictly confined to those behaviors between individuals that can be sustained indefinitely through time*⁹.

The causal basis for this claim has been demonstrated by the study of game theory. Game theory has shown that for sustainable mutually beneficial behaviors to become established there must be long-term interactions between individuals. This points out the limitation of reciprocity. It can only become established between members of a self identified group that interact in a stable environment over an extended period of time. It is, as a result, rarely found in the relationships between autonomous groups. Reciprocity should also define the ethical relationships between the individual and the group. If our goal is biological continuity, then our goal must be to establish a sustainable balance between the desires of the individual and those of society.

Section Four: Ethical Relationships between Groups

Proposition 26: Group Identity

I submit that group identity is the primary factor in the acceptance and extension of ethical obligations by human beings.

Proposition 27: Worldviews

Group identity is now predominantly a product of our culturally derived worldview. This is opposed to our adapted past where group identity was largely a function of kinship.

Proposition 28: Group Size

I submit that population size is the ultimate cause that shapes the structure of social organization.

In the history of mankind the enduring cause of evil between humans is the innate behavioral tendency for individuals to identify with similar others and form *pseudospecies groups*. "Pseudospeciation refers to the tendency for tribal or nationalistic groups to organize socially in terms of in-groups versus out-groups, treating out-groups as though they were members of another species and were hence open targets for predation, hostility, and genocide," (Campbell, 1979, 43). It is not, therefore, the internal relationships of groups that produces evil; it is the irrational xenophobic fear and animosity directed toward those outside the group. The result of this behavioral tendency is that human history is mainly the history of internecine conflict and genocide.

The basic pseudospecies groups is the natal group or small band of closely related individuals. The earliest and longest period of human history consisted of such small bands of hunter-gathers. This is what I refer to as our adapted past. The dominate trend in human history has been population growth followed by the evolution of social organization from the hunter-gather bands to nation states ¹⁰. The legacy of our adapted past is that we still, today, instinctually identify with like-kinds to form pseudospecies in-groups. But what has changed is that we now identify like-kinds predominately based on shared worldviews and not by natal group or kinship.

World War I, World War II, Korea, Vietnam, Cambodia, Bosnia, Rawanda—The question can be asked: Is the twentieth century any different from our violent past except in the sheer scale of human slaughtering human? If there is one ethical goal that we must strive for, it must be to overcome the instinctual tendency to form pseudospecies groups. This is surely the best example of a characteristic that natural selection has given us that we must now use rational ethics to circumvent. And our ethics must be rational ethics, for our moral sentiments extend no further than the limit of our in-group.

Traditional rational ethics, however, have been just as ineffective as the moral sentiments at establishing a workable ethic between autonomous groups. Both our moral

sentiments and traditional Kantian rational ethics fail to bridge the moral gap between pseudospecies groups but for different reasons. The moral sentiments fail because of genetic competition between non-related individuals. As Donald Campbell points out: "human urban social complexity has been made possible by social evolution rather than biological evolution. This social evolution has had to counter selfish individualistic and familistic tendencies which biological evolution has selected, and continues to select, as a product of the genetic competition among the cooperators." (Campbell, 1979, 40-41).

On the other hand, traditional rational ethics fail because of the failure to achieve consensus on either a categorical imperative or assumed ultimate goals. As Campbell observes, mediational ethics "is only meaningful to a community that shares [the same] ultimate goal." (Campbell in Callebaut, 1993, 440). And that "Scientific mediational normative ethics could be developed for any ultimate goal, but such development is obviously of little social or practical moral use unless the ultimate goals to which they are directed enjoy considerable popular consensus." (Campbell, 1979, 38). This lack of consensus may be explained by understanding the mechanisms of cultural transmission (such as imprinting) that produce the tenacious long-term conservation of irrational beliefs from one generation to the next (Cavalli-Sforza, 1995, 224-226). We cannot achieve consensus without cultural change, and cultural change is extremely difficult when it involves irrational beliefs.

Many, if not most, moral philosophers have avoided this issue by assuming some universally homogeneous group rather than address the moral gap between groups. Robert Richards states that his revised version of evolutionary ethics (RV) "stipulates that community welfare is the highest moral good." (Richards, 1987, 620). But the closest he comes to addressing ethics between groups is to say that "as men become wiser and old fears and superstitions fade, they may come to see their brothers and sisters in every human being and to discover what really does foster the good of all people." (Richards, 1987, 605). This is surely wishful thinking of the highest order and certainly fails to address our most intractable moral problems.

Proposition 29: The Ontological Solution

I submit that ethical mediation at the level between autonomous groups, and between humans and other life-forms must be based on the shared ontological identity that results from an understanding of the unity of life.

Section Five: The Sources of Motivation for Ethical Behavior

1) The Moral Sentiments

"'According to nature' you want to *live*? O you noble Stoics, what deceptive words these are! Imagine a being like nature, wasteful beyond measure, indifferent beyond measure, without purposes and consideration, without mercy and justice, fertile and desolate and uncertain at the same

time; imagine indifference itself as a power—how *could* you live according to this indifference?" —Nietzsche, 1989

"The universe we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil and no good, nothing but blind, pitiless indifference." —Dawkins, 1995, 133

Proposition 30: Moral Sentiments

Our moral sentiments, because they are a product of natural selection, are ethically flawed in two respects:

The Temporal Flaw: Any process of selection, be it natural or artificial, suffers the same defect. No matter what traits, and moral sentiments are traits, that are selected by natural selection, they were selected for their utility in the past and are thus prey to historical contingency. As Donald Campbell observes "The wisdom of any evolutionary process, biological or social, is wisdom about past worlds." (Campbell, 1979, 44). The temporal flaw of our moral sentiments is that they were selected for how they served the past, not for how they will serve the present.

The Population Flaw: Natural selection has maintained a natural fecundity in all life-forms that will always produce more individual organisms than the environment can sustain. Therefore, in all natural biological systems more offspring are produced than the environment can support. As a necessary result, only a subset of these offspring will achieve an optimal life history. Some will be naturally selected by circumstances to be the winners in the game of life, others will lose. In this sense natural fecundity is always *excessive fecundity*. Excessive fecundity leads to competition for resources and competition leads to natural selection. Under natural selection there will always be winners and losers in the game of life, but neither the winners nor the losers chose to be in the game. As Nietzsche's Dictum points out, no one has a choice about their existing. The population flaw is revealed by the moral observation that no one is morally responsible for their being, and yet, our moral sentiments compel us toward natural levels of fecundity.

2) Rational Motivations for Ethical Behavior

Absolute Categorical Imperatives

Proposition 31: Absolute Categorical Imperatives

I submit that absolute categorical imperatives require absolute truths in order to be valid. Absolute truths, in turn, require absolute knowledge to prove their validity. Absolute knowledge is not possible, therefore the existence of absolute categorical imperatives is not possible. It would require absolute knowledge to be sure that we were

aware of all the phenomena in the universe. And to have absolute knowledge would require a knowledge of all places in the universe throughout all of time—clearly an impossibility in a world of mortal beings. Therefore, without absolute knowledge all knowledge claims must be tentative. It is therefore logical to demand that absolute truths require absolute knowledge, and from this deduce that there can be no absolute truths ¹¹. Some examples of categorical imperatives that have been proposed are Kant's 'Categorical Imperative', which maintains that the rights of the individual are basic, and the utilitarian's 'Greatest Happiness Principle', that states you should act in order to maximize as much happiness as you can (Ruse, 1986, 70).

Contingent Assumed Ultimate Goals: Biological Continuity, Sustainability, Optimization, and the Quality of Human Life

"For ethics, we have to make an *unproven choice* of values. I suggest *human survival under humane conditions*: We don't want humans under r-selected conditions (as many offspring as possible, most of them dying, earlier and earlier pregnancies, etc.)."—Campbell in Callebaut, 1993, 439

I have tried to demonstrate in Part One the logical justification for the moral imperative of biological continuity. I now wish to show that the moral prescription of *sustainability* is directly derived from the imperative of biological continuity. If we wish to maintain biological continuity, our behaviors must be indefinitely sustainable. This, however, is not enough. We must define what type of world we wish to sustain. What must be added to sustainability is the concept of *optimization*. It is not enough for the human mind to maintain biological continuity without addressing the quality of human life. Ethical behavior is shared, end directed behavior. Thus the end toward which our behavior is directed defines the desired state we collectively wish for in the future. Defining this *desired future state* must be done as a part of defining our ethical behavior. But defining this desired future state should not be concerned with details. It must be derived from something more fundamental, and the fundamental observation that is crucial is that each of us at birth has an inherent constructive potential. So without regard to specifics, it is enough to set as our goal that every individual be allowed to achieve this potential. Every child born should have the chance to live an optimal life history. Here the term optimal is very important—remember we must be dealing with intent. Historical stochastic events will always intervene in the course of human affairs, but what is the intent of our ethical end directed behavior? It must be to make the best of every life lived. So from sustainability we are forced to think of what state we wish to sustain, and it must be a state where we strive to optimize the life of every child born.

Optimization & Reproduction

Condorcet's Obligation— "Men will know, then, that, if they have obligations towards beings who are yet to come into the world, they do not consist in giving to them existence only, but happiness" —*Sketch for an Historical Picture of the Progress of the Human Mind* by Antoine-Nicolas de Condorcet, 1795 (in Hardin, 1993, 24)

The ethical concept of *optimization* is the moral goal, as expressed in Condorcet's obligation, of providing the best possible opportunity for an *optimal life history* for every child. As I have pointed out, natural selection has maintained a natural fecundity in all life-forms that will always produce more individual organisms than the environment can sustain. Therefore, for any ethic there must be a set of ethical principles that can mediate the conflicting claims of individuals for limited resources. But how do you mediate claims for the necessities of life when there isn't enough for everyone? Ethical systems must first be concerned with how we will provide for every individual. Therefore, we must first deal with controlling natural levels of fecundity. And nowhere has the change in our control of natural processes been more profound than in the area of human reproduction. Our technical ability to effectively and humanely control conception is the single most important moral event of our age. Our control over every aspect of our reproduction will soon be very flexible. This means that, in the not so distant future, we will be able to turn fertility on and off at will and insure healthy reproduction for all. But this also means that human reproduction has now become a moral imperative that we are obligated to direct to achieve our moral goals. With this control of our fertility, society has become morally responsible for the conception of every child. This is true in spite of the cultural impediments against contraception. It must be recognized that we must control the level of our fecundity before a sustainable balance can be achieved between the moral claims of individuals. And it is only when we achieve this stable, sustainable level of fecundity that the goals of the individual and the goals of society will be the same.

Reproduction in an Over-Populated World

Do we live in an over-populated world today? Many people believe we do, but if we don't, then surely by the time the world's population reaches 11 billion in the year 2070, we will (see Cohen, 1995; Lutz, 1997).

Garret Hardin in his book *Living within Limits* addresses the moral aspects of human reproduction. "Are the terms "birth control" and "population control" synonymous? A bactericide selects for its own failure; an insecticide selects for its failure; and so also—for the same Darwinian reason—does *purely voluntary* control of reproduction select for failure as a means of population control." (Hardin, 1993, 255). Birth control does not mean population control. In an over-populated world, society will be forced to decide who should reproduce and who should not. Remember that if an over-populated society does not limit its numbers, nature will. The default position for doing nothing is always natural selection.

Hardin goes on to claim that for reproductive rights to be ethically "symmetrical" the statement of rights must read: "Every woman has the unqualified right to refrain from having children; but the privilege of bearing a child must take into account the interests of society, which shoulders so many of the costs of child-rearing." (Hardin, 1993, 265-266). The ethical principle operating here is equity, which in this case demands that *rights and obligations must match benefits and costs*.

It's important to note that if society does not assume the costs of child-rearing in an over-crowded world, then what will happen is the default position of natural selection. Nature will decide which children survive in a world that can not support all of the children born. It will either be this or the rich will be the only ones able to successfully raise children and we're back to gross inequity—which can be shown to be the default position, i.e. gross inequity is a sure sign that natural selection is operating. Another possible scenario is to have complete equity in resource distribution but no population control. In this case it's possible for all of the children that are born to starve equally—the default position wins again. Thus morality can only be sustained in a society if adequate resources are available to optimize the life of every individual born. Competition per se is not the evil; it is competition for limited resources, i.e. *competition to the death*, that is morally wrong. In a world of natural fecundity there will always be competition for resources and, as a result, inequity brought about by competition. If, however, we are able to control our fecundity, then it may be possible to optimize the life of every child.

What I propose is that society provide every individual the medical, technical care so that every individual can successfully reproduce, and that society also provides the equal and adequate resources for the optimal development of every child born. But in return, society must demand that no one has the right to have more than the replacement number of children. This is within our control and it works with, rather than against, human nature. It is also the minimum we must do to control our natural fecundity so we may hope to save not only ourselves but the rest of life on earth.

Section Six: The Ethical Relationship between Humanity and other Life-forms

The Sixth Extinction ¹²: What are the realities of our relationship to the natural world? I submit it is something akin to the relationship between groups of early agriculturists— "kill everybody except those you grew up with and only stop killing when somebody stronger than you makes you". Humanity simply does not let nature stand in the way of what it wants. The results of this are predictable: We are wiping out, at an ever increasing rate, the other life-forms on Earth. The scale of this slaughter is comparable to, if not greater than, the scale of species extinction that occurred during the five commonly recognized mass extinction events in the history of life. It is, therefore, a valid question to ask: Are there any ethical relationships between humanity and other life-forms? And if there are, when will we accept our moral obligations toward other life-forms—before or after we drive most of them to extinction?

Proposition 32: Reproduction and Genetics

It must be recognized, as an empirical observation, that life's chemistry maintains biological continuity by using genetically encoded information and the phenomenon of reproduction. Therefore, the moral justification for reproduction and genetics as moral imperatives is a descriptive justification based on how life actually provides for biological continuity.

Proposition 33: Genetic Diversity

Genetic diversity, as a surrogate measure of life's well-being, is a moral imperative. The central goal of ethical naturalism then must be to maintain the greatest sustainable amount of living biomass that has at the same time the greatest genetic diversity possible. From this view human behavior is "right", in the sense of morally correct, only when it promotes life to flourish. It follows then from Proposition 18, that any human action that reduces the genetic diversity of life on earth is morally wrong. It also follows from Proposition 18, that for humanity to increase its sheer biomass at the expense of biological diversity is also morally wrong.

Proposition 34: The Moral Imperative of Reproduction

Reproduction is a prescriptive moral imperative of populations of reproductively isolated organisms including ourselves. As such, it is an obligation of moral agents to promote successful reproduction within these populations. Our moral obligation toward other species is, however, toward the population and not individuals. We have moral obligations to individual organisms only to the extent that their lives provide for the biological continuity of their population.

This moral fact presents a difficult problem for the human population. In an overpopulated world, we cannot morally support the lives of individuals who are in their post-reproductive years at the expense of our progeny. One qualification to this is that human beings may contribute vastly more to the very end of their natural life span than is needed to sustain them.

But the logic of Nietzsche's Dictum prevents us from making heartless calculations of this sort. Everyone born to this world has an equal moral claim to the obligations of moral agents. The only way out of this seeming paradox is to control our natural fecundity. This is the only humane hope we have if we are to avoid the cruel logic of natural selection.

Epilog

So logically, where does all this lead us? The problem is that it's very easy to defer to the default position of natural selection, but very hard to follow a rational, humane, ethical course of action. So why should we bother?

We must ask ourselves: Who would care if humanity destroyed itself? The answer is: No one. There is no one else to care. But who will care if humanity destroys the rest of life on Earth? The answer must surely be—we do. We are but one form, one experiment in the incredible story of life on Earth. One ephemeral, momentary form in this vast flowing pattern of life surely does not have the moral license to destroy the source that gave rise to it. But will we be able to answer Simons' question for the better? "Will we, by better understanding the processes that made us what we are, grow in capacity to solve the frightening problems of the future arising from our very selves?" (Simons, 1989, 1349).

As Collier and Stingl put it in their article *Evolutionary Naturalism and the Objectivity of Morality*:

"It may be that we lack the cognitive capacities to fully articulate our moral instincts (especially in large societies), and it is certainly possible that other instincts will dominate, and we will end up in an immoral but self-preserving fascist dead end, or some other abomination. Furthermore, our capacity to perform the moral Copernican revolution may be restricted for reasons unknown to us. Perhaps our instincts are so restricted that this move will be prevented; we may be doomed to view the world anthropocentrically. It is even possible that we could intellectually discover an optimal ethics for creatures like us, but lack the motivation to implement it. On the other hand, the adaptive advantages of intellectual and emotional flexibility for intelligent social creatures are great, and it seems likely that any creature that has evolved morality, and the cognitive capacity to articulate it reflectively, will also have the flexibility to override the limitations of its instincts, however difficult this might be." —in Thompson, 1995, 426

Notes:

1. Laudan provides a concise summary of the position of modern pragmatists on realism: "The explanation of the empirical success of science is going to have to be sketched, at least in part, in terms of the linkages between us, our beliefs, and the natural world. If the world did nothing whatever to shape and inform our beliefs about it, it would be absolutely extraordinary if our theories managed to work as well as they do." (Laudan, 1990, 165-166).

2. For a discussion of the division of ethics into a descriptive discipline and a prescriptive discipline see Richards (1987, 607).

3. Ruse gives the following definition of epistemic values: "Against the background presumption that our aim is to understand the world of experience, a world of unbroken regularity, these values are tools or standards that we cherish, since 'they are presumed to promote the truth-like character of science, its character as the most secure knowledge available to us of the world we seek to understand' Hence, an 'epistemic value is one we have reason to believe will, if pursued, help toward the attainment of such knowledge' (McMullin, 1983, 18; see also Kuhn, 1977, 321-322)." (Ruse, 1996, 9-10).

4. See Callebaut for an overview of this position: "We, who are a part of nature, help *construct* her. The consequences of our knowing efforts therefore have all of the liabilities of any natural process: our knowledge is uncertain and fallible, but also corrigible." (Callebaut, 1993, 3).

Also as Laudan puts it: "we find ourselves in a situation where our only contact with the world is mediated by our concepts. We posit certain beliefs or theories to make sense of that mediated world. If those beliefs or theories were entirely free-floating and reflected nothing whatever about the world itself, then it would be unthinkable that they would enable us to manipulate the world as effectively as we can." (Laudan, 1990, 165-166).

5. This may be or related to what Collier and Stingl have called the "moral Copernican revolution", see *Evolutionary Naturalism and the Objectivity of Morality* in Thompson (1995, 426).

6. Donald Campbell speaks of the "moral wisdom in the genome" and states "Most of us admire the tremendous wisdom which biological evolution has built into the minds and behaviors of animals." (Campbell, 1979, 39, 44). I take this to be a reference to the moral sentiments.

7. I am indebted to Paul W. Taylor for this concept of moral agents. For further information see Taylor (1986, 14, 82, 86-87, and 100).

8. The issue here is whether our evolved moral sentiments and their intuitive expressions are adequate to provide a contingent foundation for our ethics. The issue is extensively covered in Thompson (1995).

9. Marc Mangel provides this on sustainability and game theory: "The ideas of John Maynard Smith, based on the notion of an evolutionarily stable strategy (roughly, a strategy that, when adopted by all the members of a population, prevents the invasion through natural selection of any alternative strategy), form the foundation of evolutionary game theory." (Animal analysts who know their plays. *Nature*, 395(September 3), 32.)

This paraphrase of Maynard Smith's concept of evolutionarily stable strategies (ESS) is remarkable in showing that it is natural selection that must be thwarted. I arrive at the same conclusion in Proposition 30. Note that in this section I have therefore shown the logical connections between Peter Singer's "the principle of equal consideration of the interests of all." and Maynard Smith's evolutionarily stable strategies. Singer's principle is one of Maynard Smith's evolutionarily stable strategies.

Also note that seeing natural selection as the enemy of morality is nothing new. The tradition started with T. H. Huxley and continues today with George C. Williams (see Paradis & Williams, 1989).

10. Jared Diamond, in his book *Guns, Germs, and Steel* (1997), covers the history of this transition. It's also fair to say, based on his account, that the ethical relationship between groups of the first agriculturist was something like—kill everybody except those you grew up with and only stop killing when somebody stronger than you makes you.

11. Absolute truths are also called "incorrigible givens" or "indubitable givens". For a discussion of their current status see Laudan (1990, 134-135). In addition to this argument against the possibility of absolute truths there is Gödel's insight on the logical limits to human knowledge. Gödel's Second Incompleteness Theorem states that: "the full validity of any system, including a scientific one, cannot be demonstrated within that system". The central implication of the theorem is: "there is not and never will be a complete and comprehensive scientific account of the universe that can be proved valid" (Ferris 1988, 384).

12. The term "sixth extinction" was first used by E. O. Wilson in his book *The Diversity of Life* (1992, 32). There is also a book by the same name written by Richard Leakey and Roger Lewin (Leakey & Lewin, 1995). I recommend both books for more information on the biodiversity crisis. For an over-view of mass extinction events see *Extinction: Bad Genes or Bad Luck* by David Raup (1991).

Appendix One: Consilience

The importance of this term originally became clear in trying to understand Darwin's application of evidence in support of his theories on evolution. Darwin was greatly influenced by the philosophy of William Whewell who was the first to use the term. It is therefore important that we understand Whewell's terminology (Ruse, 1986; Ruse, 1989b; Gould, 1989).

The term was originally coined by Whewell in his book "The Philosophy of the Inductive Sciences" (1840). From his "Novum Organon Renovatum" (1858) is the following: "The Consilience of Inductions takes place when an Induction, obtained from one class of facts, coincides with an Induction, obtained from a different class." As restated by Ruse (1986) it means "to bring many disparate areas of inquiry under one unifying principle", "this integration Whewell termed a "consilience of Inductions". Literally the term means "jumping together" (Gould, 1989). I interpret consilience to be the condition or characteristic that a theory has when it provides a unifying explanation for many disparate areas of study.

Much has changed since I first wrote this brief note in 1989. For a current discussion of the relationship between consilience and the notion of epistemic values see Ruse, 1996, page 10. I originally added this appendix because the term consilience was little known outside the philosophy of biology. This has changed of course with the publication of E. O. Wilson's book by the same name (Wilson, 1998).

Bibliography and References

Gould, S. J. (1989). *Wonderful Life: The Burgess Shale and the Nature of History*. New York: Norton. (refer to page 282)

Ruse, M. (1986). *Taking Darwin Seriously*. New York: Basil Blackwell. (refer to pages 2-4 & 39)

Ruse, M. (1989a). Booknotes. *Biology & Philosophy*, Vol. 4, No. 1(January), 121-127. (refer to page 124)

Ruse, M. (1989b). *The Darwinian Paradigm: Essays on its History, Philosophy, and Religious Implications*. Routledge: London. (refer to pages 12-13)

Ruse, M. (1996). *Monad to Man: The Concept of Progress in Evolutionary Biology*. Harvard University Press. (refer to page 10)

Whewell, W. (1840). *The Philosophy of the Inductive Sciences Founded Upon Their History* (1st edition). London: Parker. (source reference for the term consilience)

Whewell, W. (1858). *Novum Organon Renovatum*. London: Parker. (Pt. II of the 3rd ed. of *The Philosophy of the Inductive Sciences*).

Wilson, E. O. (1998). *Consilience: The Unity of Knowledge*. New York: Knopf.

Appendix Two: Dissipative Structures

See Prigogine and Stengers' book *Order out of Chaos* for a definition and extended discussion of dissipative structures (Prigogine, 1984). But also note that the general idea of organisms as dissipative structures has been put forward before.

Here are two examples.

Huxley used the analogy of the whirlpool in a river to describe the life process.

"Living bodies," he said in 1884, "are just such whirlpools. Matter sets into them in the shape of food, sets out of them in the shape of waste products. Their individuality lies in the constant maintenance of a characteristic form, not in the preservation of material identity. If you dam the stream ... the whirlpool dies."

—Huxley, T. H. (1967). *On a Piece of Chalk: A Lecture by T.H. Huxley*. New York: Scribners (page 15).

In the early seventies Yale University biophysicist Harold Morowitz wrote this:

"...each living thing is a dissipative structure, that is, it does not endure in and of itself but only as a result of the continual flow of energy in the system... From this point of view, the reality of individuals is problematic because they do not exist per se but only as local perturbations in this universal energy flow.... An example might be instructive. Consider a vortex in a stream of flowing water. The vortex is a structure made of an ever-changing group of water molecules. It does not exist as an entity in the classical Western sense; it exists only because of the flow of water through the stream. If the flow ceases the vortex disappears. In the same sense the structures out of which the biological entities are made are transient, unstable entities with constantly changing molecules dependent on a constant flow of energy to maintain form and structure."

—Morowitz, Harold J. (1972). *Biology as a Cosmological Science. Main Currents in Modern Thought*, 28, 156.

Appendix Three: Erasmus Darwin

In all areas of study truly original ideas are rare, and so it is with my ideas on the unity of life and the moral implications derived from that unity. Charles Darwin's grandfather Erasmus Darwin was, as shown by the following quotations from Desmond King-Hele's book, surely one of the first thinkers to make the connection between biology and ethics. It should then be no surprise that he was also a philosophical naturalist.

"he was scornful of organized religion, and he included Credulity, Superstitious Hope, and the Fear of Hell in his catalogue of diseases. He complains of an 'intellectual cowardice instilled into the minds of the people from their infancy': 'credulity is made an indispensable virtue' and 'inquiry is held to be more sinful than moral crimes'. The cure for credulity is 'to increase our knowledge of the laws of nature', 'to emancipate ourselves from the false impressions which we have imbibed in our infancy, and to set the faculty of reason above that of imagination'"
—King-Hele, 1963, 55

"For Erasmus Darwin the theory of evolution was no mere scientific hypothesis but the very basis of his philosophy of life," "For, if all forms of life have a common microscopic ancestor, we should look on the animals and insects as our cousins—

man . . .
Should eye with tenderness all living forms,
His brother-emmets, and his sister-worms.
—King-Hele. 1963, 90

"Erasmus was far more aware than his successors of the philosophical and religious implications of evolution, and used the theory as the basis for his philosophy of organic happiness. We are all descended, he thought, from a common microscopic ancestor --

Imperious man . . .
Arose from rudiments of form and sense,
An embryon point, or microscopic ens!

So we should look on even the humblest creatures as our cousins, and promote the general happiness of organic life." —King-Hele, 1963, 94)

King-Hele, Desmond (1963). *Erasmus Darwin*. New York: Scribners.

Appendix Four: Ethics and Epistemology

Donald T. Campbell has this illuminating portrait of a naturalistic ethic.

"For ethics, we have to make an *unproven choice* of values. I suggest *human survival under humane conditions*: We don't want humans under r-selected conditions (as many offspring as possible, most of them dying, earlier and earlier pregnancies, etc.). We don't want human survival with fundamental species change. [If we choose human survival under humane conditions—D. A.] Then we can do most of our ethics as *mediational ethics* (Campbell, 1979). It is only meaningful to a community that shares that ultimate goal. But for those mediational ethics, we then use scientific hypotheses about human nature and the nature of the environment—we are doing *hypothetical, contingent mediational ethics*. Similarly there is no proof that one should want to know. But if one chooses the value of mapping (unobserved) physical reality better and better, then a *hypothetical, mediational, normative epistemology* that is contingent as to our guesses concerning the nature of the world and the problem-solving capacities and tools available to man is available. It is contingent, as sciences is contingent. People still reject the cultural evolutionary ethics of the last century as thoroughly disproven. That's absolutely wrong. They were contingent, hypothetical, *scientific ethics*." [i.e. if the scientific hypothesis proved true, then the ethical observations drawn from them could be justified, but the science was bad—D. A.]

The quote is in Callebaut (1993, 439-440).

References

Callebaut, W. (1993). *Taking the Naturalistic Turn or How Real Philosophy of Science is Done*. Chicago: University of Chicago Press.

Campbell, D. T. (1979). Comments on the Sociobiology of Ethics and Moralizing. *Behavioral Science*, Vol. 24, 37-45.

Glossary of Terms

I have added a glossary for three reasons. The first is that I have intentionally used the same jargon used by the philosophers whose work I am addressing. The second is to specify which meaning I am using when a term has multiple meanings. The third is to make the paper accessible to a wider audience.

Normative—pertaining to a standard or norm; to refer to the foundational principles of an ethical system

Proposition—the act of offering or suggesting something to be considered

Moral Premise—A moral premise is a statement of what we should do; an ought statement. It is a statement of purpose or desired goal. To be logically complete it must include a reasoned statement of justification or why we should do it. Moral premises are the normative principles of an ethical system.

Purpose—an intended or desired result; end; aim; goal.

Promote—to help or encourage to exist or flourish; to aid; or to assist

Epistemology—a branch of philosophy that investigates the origin, nature, methods, and limits of human knowledge.

Prescriptive—that which gives direction or rules; prescriptive statements are statements of what we should do.

Prescriptive Epistemology—rules for how we should view the world that are based upon more fundamental epistemological assumptions.

Epistemic Values—see note #3

Coherence—the logical connections between the elements of a set of concepts and facts; the degree of coherence that a set of concepts and fact has is a measure of its internal logical consistence; in science all concepts and scientific facts must cohere to all other scientific facts and concepts, they must be internally, logically consistent.

Consilience—see Appendix One

Descriptive—that about a phenomena that can be proven or verified by experience or experiment; descriptive statements are empirical observations subject to scientific verification.

Descriptive Epistemology—empirical observations on how we actually view the world.

Metaphysics—a branch of philosophy that deals with first principles. Note that if it is assumed that first principles are *a priori*, meaning they are not based on prior study or examination, then naturalism must reject metaphysics. If, on the other hand, metaphysics is used to describe the attempt to derive basic ethical principles from observations of the material world, that is *a posteriori*, then I stand accused of doing metaphysics.

Ontology—I apply only one meaning to this term, that of the study of the material nature of our being. In my writings, it is to be understood that ontology for me is always a naturalistic ontology.

to value (verb)—to consider with respect to importance.

a value (noun)—that which we consider to be of importance in determining our ethical behavior.

Provide—to supply; to aid; or to assist.

Essentialism—the belief that things have an *a priori* essences that exists apart from the material existence of their being; esp. a spiritual or immaterial entity.

Dissipative structure—a structure that exists only by virtue of the flow of energy and matter into the structure to replace that which has been irreversibly dissipated out of the structure. Dissipative structures can arise spontaneously in non-linear thermodynamic systems that exist under conditions far from energy equilibrium. Simple examples of dissipative structures are vortices in water or air such as whirlpools or whirlwinds. (also see Appendix Two)

Reify—to convert into or regard as a concrete thing; to objectify; to inappropriately regard a dynamic phenomenon as a static object.

Pseudospecies Groups—pseudospeciation refers to the tendency for tribal or nationalistic groups to organize socially in terms of in-groups versus out-groups, treating out-groups as though they were members of another species and were hence open targets for predation, hostility, and genocide.

References

Bradie, Michael (1994). *The Secret Chain: Evolution and Ethics*. Albany, New York: SUNY.

Burke, J. (1985). *The Day the Universe Changed*. Boston: Little, Brown.

Callebaut, W. (1993). *Taking the Naturalistic Turn or How Real Philosophy of Science is Done*. Chicago: University of Chicago Press.

Campbell, D. T. (1979). Comments on the Sociobiology of Ethics and Moralizing. *Behavioral Science*, Vol. 24, 37-45.

Cavalli-Sforza, L. L., & Cavalli-Sforza, F. (1995). *The Great Human Diasporas: The History of Diversity and Evolution*. Addison Wesley.

Cohen, J. E. (1995). *How Many People Can the Earth Support?* New York: Norton.

Collier, J. & Stingl, M. (1995). *Evolutionary Naturalism and the Objectivity of Morality* in Thompson (1995).

Dawkins, R. (1986). *The Blind Watchmaker*. New York: Norton.

_____ (1989). *The Selfish Gene, 2nd edition*. Oxford: Oxford University Press.

_____ (1995). *River Out of Eden: A Darwinian View of Life*. New York: Basic Books.

Dennett, D. C. (1995). *Darwin's Dangerous Idea: Evolution and the Meanings of Life*. New York: Simon & Schuster.

Diamond, J. (1997). *Guns, Germs, and Steel*. New York: Norton.

Ferris, T. (1988). *Coming of Age in the Milky Way*. New York: Morrow.

Hardin, G. (1993). *Living within Limits: Ecology, Economics, and Population Taboos*. Oxford: Oxford University Press.

Hollingdale, R. J. (1977). *A Nietzsche Reader*. New York: Penguin Books

Hume, D. (1978). *A Treatise of Human Nature*, edited by L. A. Selby-Bigge, revised by P. H. Nidditch. Oxford: Clarendon Press. 2nd ed. (cited as Hume, 1739)

Laudan, L. (1990). *Science and Relativism*. Chicago: University of Chicago Press.

Leakey, R., & Lewin, R. (1995). *The Sixth Extinction: Patterns of Life and the Future of Humankind*. New York: Doubleday.

Lutz, W., Sanderson, W., & Scherbov, S. (1997). Doubling of World Population Unlikely. *Nature*, 387(June 19), 803-805.

Mayr, E. (1982). *The Growth of Biological Thought: Diversity, Evolution, and Inheritance*. Cambridge, MA: Harvard University Press.

Moore, G. E. (1903). *Principia Ethica*. Cambridge, UK: Cambridge University Press

Nietzsche, F. (1989). *Beyond Good and Evil: Translated by Walter Kaufmann*. New York: Vintage Books.

Paradis, J., Williams, G. C., & Huxley, T. H. (1989). *T. H. Huxley's "Evolution and Ethics" with New Essays on Its Victorian and Sociobiological Context*. Princeton: Princeton University Press.

Prigogine, I., & Stengers, I. (1984). *Order out of Chaos*. New York: Bantam.

Raup, D. M. (1991). *Extinction: Bad genes or Bad Luck?* New York: Norton.

Richards, R. J. (1987). *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior*. Chicago: University of Chicago Press.

Ruse, M. (1986). *Taking Darwin Seriously*. New York: Basil Blackwell.

_____ (1996). *Monad to Man: The concept of Progress in Evolutionary Biology*. Cambridge, MA: Harvard University Press.

Simons, E. L. (1989). Human Origins. *Science*, 245(September 22), 1343-1350.

Singer, P. (1981). *The Expanding Circle: Ethics and Sociobiology*. New York: Meridian.

Taylor, P. W. (1986). *Respect for Nature*. Princeton: Princeton University Press.

Thompson, P. (1995). *Issues in Evolutionary Ethics*. Albany, New York: SUNY.

Webster's (1989). *Webster's Encyclopedic Unabridged Dictionary of the English Language*. New York: Gramercy Books.

Wilson, E. O. (1992). *The Diversity of Life*. Cambridge, MA: Belknap Harvard.

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