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# Do Survival Values Form a Sufficient Basis for an Objective Morality: A Realist's Appraisal of the Rules of Human Conduct

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## COMMENT

# Do Survival Values Form a Sufficient Basis for an Objective Morality?<sup>1</sup>: A Realist's<sup>2</sup> Appraisal of the Rules of Human Conduct

### I. INTRODUCTION

#### A. *The Question Presented in its General Form*

Can we say that the species called *homo sapiens sapiens* ought to survive? Every day, year in and year out, we follow all sorts of rules. What does surviving have to do with these rules?

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1 This essay advances portions of a theory about human behavior in the context of the physical world. It does not provide a theory about life as a whole. Survival, which appears to be a condition of physical life, seems worthy of its own discussion. Such a discussion may help clarify the relationship between surviving and living. In the end, the discussion points to questions both practical and metaphysical.

A particular reference point for the general theme is H.L.A. HART, *THE CONCEPT OF LAW* 181, 181-95 (Chapter IX on law and morals). Of equal importance are *Regina v. Dudley*, 14 Q.B. 273 (1884), reprinted in SANFORD H. KADISH & STEPHEN J. SCHULHOFFER, *CRIMINAL LAW AND ITS PROCESSES* 114-19 (5th ed. 1989) and L.L. Fuller, "The Case of the *Speluncean Explorers*," 62 HARV. L. REV. 616 (1949). The catalyst for an essay on objective values comes from a jurisprudence course taught by Professor G. Robert Blakey at the Notre Dame Law School. Additional insights on objective values come from a course on moral theory and the U.S. Constitution taught jointly by Professor Gerard V. Bradley of the Law School and Professor Sotirios Barber of the Government Department.

2 A realist, for the purposes of this essay, is one who analyzes factual situations in order to formulate statements about facts and about relationships between facts through inferences. Such statements are not the principal reality but are at most reflections of that reality captured by the imagination and expressed in words and concepts available to the particular realist. Other formulations and other approaches may reflect different aspects of the same reality or reflect the same aspects of the same reality in different ways.

The position I take is that some of our reflections are accurate enough to draw reasonable conclusions about the consequences of the true state of affairs in light of an objective. A person who endeavors to drive a car safely is such a realist. Can such a realist, as a realist, say or perceive anything about the moral conditions of driving a car? See generally DAVID O. BRINK, *MORAL REALISM AND THE FOUNDATIONS OF ETHICS* (1989); JOHN C. ECCLES, *EVOLUTION OF THE BRAIN* (1989); WILLIAM JAMES, *PRAGMATISM* (1907); Imre Lakatos, *Falsification and the Methodology of Scientific Research Programmes*, in *CRITICISM AND THE GROWTH OF KNOWLEDGE* 91 (Imre Lakatos & Alan Musgrave eds., 1970); KARL H. PRIEBRAM, *BRAIN AND PERCEPTION* (1991); *THE STRUCTURE OF SCIENTIFIC THEORIES* (Frederick Suppe ed., 2d ed. 1977); GRAHAM WALKER, *MORAL FOUNDATIONS OF CONSTITUTIONAL THOUGHT* (1990); Michael Moore, *Moral Reality*, 1982 WIS. L. REV. 1061.

### B. Observations and Conclusions

We live in a physical world. We hold metaphysical thoughts and religious convictions in our heads. We rely on information and theories, both physical and metaphysical, to make decisions. From this pool of information and theories, we develop or receive systems of morality.<sup>3</sup> We use this pool of information and these theories to develop other theories which we then use to interpret events or give meaning to our lives.<sup>4</sup>

We face a physical *problem*. In order for our theories to have any impact on either ourselves or the physical world around us, we have to survive.<sup>5</sup> By surviving I mean that we continue to live our lives into the next day and the groups with which we are associated continue to bear offspring who successively continue to survive in the future. By observing the physical world around us, we discover that in order to survive, we have to meet some minimum set of rules which we did not develop. We devise rules which are tested against that minimum. We discover that there are differ-

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3 By system of morality I mean a system of rules and values which describe correct behavior relative to a principle or objective grounded in a source. Fulfillment of the rules or actualization of the values satisfies the principle or achieves the objective. For the system to apply to an actor, the actor must have the ability to conform or not conform through some vehicle of cognizant choice.

4 To the degree that our outlook is shaped by the ideas which we absorb, which for whatever internal reason we find relevant, and which we attempt to reconcile, eliminate or live with, to that degree the following sources stand out in my mind as influences on my thought relative to the subject of this essay: THOMAS HOBBS, *LEVIATHAN* (Michael Oakeshott ed., Collier Books 1962) (1651); JEAN JACQUES ROUSSEAU, *THE SOCIAL CONTRACT* (Willmoore Kendall trans., Gateway Editions 1954) (1762); JOHN LOCKE, *TWO TREATISES OF GOVERNMENT* (Thomas I. Cook ed., Hafner Press 1947) (based on Locke's 6th ed. 1764) (1690); JOHN RAWLS, *A THEORY OF JUSTICE* (1971); JOHN E. PFEIFFER, *THE EMERGENCE OF SOCIETY* (1977); EDWARD O. WILSON, *ON HUMAN NATURE* (1978) (a discourse in socio-biology); JOHN LOCKE, *AN ESSAY CONCERNING HUMAN UNDERSTANDING* (Peter H. Nidditch ed., Oxford University Press 1975) (based on Locke's 4th ed. 1700) (1690); DAVID HUME, *A TREATISE OF HUMAN NATURE* (P.H. Nidditch ed., 2d ed. 1978) (1740); *THE NATURE OF HUMAN CONSCIOUSNESS* (Robert E. Ornstein ed., 1968) (essays in psychology and perception); *THE MIND'S I* (arranged by Douglas R. Hofstadter & Daniel C. Dennett, 1981) (essays on self and soul); ALBERT EINSTEIN, *RELATIVITY, THE SPECIAL AND GENERAL THEORY* (Robert W. Lawson trans., 1961) (1916); RICHARD P. FEYNMAN ET AL., *THE FEYNMAN LECTURES ON PHYSICS* (1963); MAX PLANCK, *WHERE IS SCIENCE GOING?* (1932); GARY ZUKAV, *THE DANCING WU LI MASTERS, AN OVERVIEW OF THE NEW PHYSICS* (1979); BOB DYLAN, *The Times They are A-Changin'*, on *THE TIMES THEY ARE A-CHANGIN'* (Columbia Records 1964), lyrics reprinted in BOB DYLAN, *WRITINGS AND DRAWINGS* 85 (1973); *Genesis* 1-4; *Ecclesiastes*; *Romans* 7; *Micah* 6:8.

5 The only exception I can see to this is if we decide not to survive.

ent combinations of rules which we have devised in the past,<sup>6</sup> there are rules which we are currently following,<sup>7</sup> and there are rules which we may yet take to their logical end,<sup>8</sup> which do not meet this minimum. A *principal purpose* of this essay is to explore what impact the minimum set of survival rules has already had, and necessarily will have, on the rules of conduct devised by humans. The impact may be more far-reaching than we have allowed for in the past.<sup>9</sup>

We face a *general set* of physical conditions. By observing the physical world around us, we discover that living organisms, including humans, are powered or directed in some way by physical forces which are generated internally. What is the nature and source of these internal forces? What significance should this have for how we view ourselves? We observe that living organisms do not require free will to survive. Yet they follow rules. Absent free will, they follow rules encrypted in instinct and trained responses. The process appears to be physical. The question is, where do those rules come from, what function do they serve, and what relationship does the internal rulemaking process of instinct and trained responses have to humans?<sup>10</sup> Humans possess rationality, consciousness, the ability to undertake moral evaluation, the ability to have religious experiences, and free will. These processes, or higher brain functions, appear to have enhanced the ability of humans to survive relative to other species. A *second purpose* of this essay is to explore the survival functions of these higher brain processes, their relationship to instinct and trained responses and their relationship to the rules humans choose to devise or adopt.<sup>11</sup>

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6 Nazi Germany is an example of rules that did not work.

7 Gunfire appears to be the second leading cause of death for Americans ten to thirty-four years of age. M. Joycelyn Elders, M.D., Surgeon General, Prepared Statement Before Subcommittee on the Constitution, Committee on the Judiciary, U.S. Senate, *reprinted in* FEDERAL NEWS SERVICE, March 23, 1994, available in LEXIS, Nexis Library, Current File.

8 Depleting the ozone layer is an example of a rule which will probably not work. Will we set in motion something we can't fix? See, e.g., Malcolm W. Browne, *Doubts Ease on Protecting Ozone*, N.Y. TIMES, Jan. 11, 1994, at C5 (scientists say doubts about the ozone-friendliness of hydrofluorocarbons, as substitutes for ozone-destroying chlorofluorocarbon refrigerants, are probably groundless); Edward O. Wilson, *Is Humanity Suicidal?*, N.Y. TIMES, May 30, 1993, § 6, at 24 (discussing effects of ozone depletion).

9 Compare HART, *supra* note 1, at 187-88.

10 See generally PRIBRAM, *supra* note 2, at 200-01 (instinctual patterns have common genetic components); WOLF AND MAN, *EVOLUTION IN PARALLEL* 81, 81-106 (Roberta L. Hall & Henry S. Sharp eds., 1978); ECCLES, *supra* note 2, at 140-71.

11 See generally JOHN C. ECCLES, *FACING REALITY* 118, 118-73 (1970) (discussing possi-

We face two *particular types* of physical conditions. Individually we tend to identify with one or more small groups, such as our family, clan, ethnic group, neighborhood or our work environment. We are also part of larger systems of humans, such as cities and nations. As typically perceived by humans, the survival interests of different groups, both large and small, are likely to clash. If human groups pursue every instinct they have related to survival, then physical conflict would be inevitable. Aggression is one of our instincts. While the conditional statement may be accurate, the implication in the sentence above it, that the *survival interests* of human groups are in conflict, may be in error. A *third purpose* of this essay is to explore what the physical rules of survival tell us about interactions between human groups.<sup>12</sup>

A fourth and *general purpose* of the essay is to encourage readers to consider or reconsider the nature of the connection between our survival processes and our systems of morality. Instincts, trained responses, moral evaluation and rational analysis all provide suggested solutions to the daily problem of human survival. These are processes which go on inside of our heads, and have been going on inside our heads for a long time. The essay is designed to take a rational, albeit speculative, look at these processes of the brain. Our physical histories trace back through our biochemical histories to the fundamental forces which regulate the universe. Whatever we may be subjectively—*objectively* we are all constructed of the same fundamental material. We are a direct expression of the underlying energy of the universe. It makes sense to know more about *how* we operate, as we try to figure out how we *ought* to operate. Our biological and physical history may provide more guidance than we are accustomed to think. I suggest it provides the basis for an objective morality.<sup>13</sup>

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bility of free will); JOHN C. ECCLES, *supra* note 2, at 217, 217-38; PRIBRAM, *supra* note 2, at 199-268; PLANCK, *supra* note 4, at 107-69 (discussing free will); ARTURO ROSENBLUETH, MIND AND BRAIN 101, 110-13 (1970); THE BIOLOGY OF THE BRAIN, FROM NEURONS TO NETWORKS (Rodolfo R. Llinas ed., 1988); PER E. ROLAND, BRAIN ACTIVATION (1993).

12 There are two circumstances: (1) each group in the system desires to survive, and (2) one group desires to survive while the others do not. Outcomes would appear to depend on whether conquest or mutual assistance becomes the more effective strategy for surviving. Where one group desires not to survive, defense is necessary. Analysis of what motivates humans is needed and game theory among free willed humans may apply. See generally JOHN C. HARSANYI & REINHARD SELTON, A GENERAL THEORY OF EQUILIBRIUM SELECTION IN GAMES (1988); JAMES P. KAHAN & AMNON RAPOPORT, THEORIES OF COALITION FORMATION (1984); ERIC M. LEIFER, ACTORS AS OBSERVERS: A THEORY OF SKILL IN SOCIAL RELATIONSHIPS (1991); THOMAS C. SCHELLING, THE STRATEGY OF CONFLICT (1960).

13 Perhaps H.L.A. Hart underestimated the consequences of our biological history

Several of the principal conclusions of the essay are:

(1) The human brain in large part functions physically. We need more facts as to its physical decisionmaking routines to determine whether those routines are in some measure predictable (e.g., through thermodynamics and quantum mechanics) or indeterminate (e.g., through free will). (2) The higher functions of the brain are potential enhancements to our prospects of survival. If humans lead themselves to extinction, then the higher functions of the brain are not enhancements to our prospects of survival.

(3) One of the functions of our moral and rational faculties has been to verbalize the physical rules of survival which became, and which become, encoded into the brain through instinct and trained responses. (4) Another function of our moral and rational faculties has been to improve or attempt to improve on these internally encoded rules through the brain's continual observations and encounters with the physical world.

(5) The physical rules of survival provide a rational basis for an objective morality which acts as a constraint, or as a neutral filter, on our subjective systems of morality. (6) Rational analysis of the consequences of violent group interactions supports a conclusion that violent interaction is no longer an effective survival strategy. If so, then the physical rules of survival support that type of behavior which would lead, in an environment of cultural diversity, individual awareness, and distributed power, to nonviolent coexistence. (7) But in order to survive, we have to decide to survive. Free willed humans are faced with a categorical question of whether to affirm or not to affirm life.

(8) Whether humans ought to survive may yield to rational analysis based on physical observations. Survival as an expression of energy is perhaps self-justifying. In addition, *if* a present value *may* exist which justifies life, whether or not perceived, then humans ought to survive to preserve the opportunity for discovering what that value may be.

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when he said: "[W]e may hold it to be a *mere contingent fact which could be otherwise*, that in general men do desire to live . . . ." HART, *supra* note 1, at 187-88 (emphasis added). Perhaps it could be otherwise, but if such an event occurred, then humans would soon no longer be life forms. Such an event would require overturning all of the rules which describe how energy functions within life forms. Hart recognizes, however, that "[w]e are committed to [survival] as *something presupposed* by the terms of the discussion; for our concern is with social arrangements for continued existence, not with those of a suicide club." *Id.* (emphasis added). In this essay I attempt to look at survival forces without presupposing anything about them.

### C. *The Specific Issue and the General Question*

If humans ought to survive, then the specific issue becomes: do observations of the physical world reveal to us meaningful rules of conduct—first, as to what the structure of the physical world *is*, and second, as to how humans *ought* to behave in light of that structure?

The physical world, for the purposes of this essay, is taken to include the entirety of the material universe and the physical processes which control it, whether known, unknown, or unknowable, and whether logically consistent or inconsistent. The physical world includes all inanimate objects and all life forms. By “reveal to us meaningful rules of conduct” I mean that such rules must describe processes which are intrinsic to the nature of the physical world, observable by humans, relevant to human conduct, and not mere products of human imagination.

In developing a theory of objective morality, I will examine the relationship between “objective values” and “moral worth.” Examining this relationship will take us back to the overall question of whether humans ought to survive.

### D. *Structure of the Essay*

In Part II, I establish the contextual basis for my analysis and consider the nature of an is/ought relationship.

In Part III, I make observations about the workings of the physical world. These observations raise questions and shed light on what life is.

In Part IV, I develop a theory of objective morality based on survival. In the process, I develop definitions of objectivity and subjectivity and examine the operation of free will with respect to rules of physical and human conduct. I conclude that the higher functions of the brain are potential enhancements to our prospects of survival and that some moral statements are reflections of the physical rules of survival.

In Part V, I develop a theory of objective values. In the process I establish a framework of particular factors which support survival. The factors remain constant while the values we assign to those factors may vary. The common ground for group interaction is the mutual desire to survive and the constancy of the factors for survival which are neutral to subjective moralities, i.e., cultural distinctions.

In Part VI, I consider the question of whether humans ought to survive. A religious or metaphysical answer may be required to answer the question. I close the essay with a thought experiment on the future impact of the developing field of genetic engineering. This thought experiment is intended to leave the reader with additional questions as to what life is.

## II. THE CONTEXTUAL SETTING

### A. *Beginning With Three Thought Experiments*

*Experiment #1.* Imagine you are the commander of a nuclear submarine submerged near the polar icecap. The area is filled with icebergs which form narrow, dangerous channels. Dr. Maybe, a madman commanding a second submarine, has chased you into one of these channels. His last torpedo blast sealed the channel behind you, separating you from him. You have ten to fifteen minutes of oxygen left. Sonar readings indicate two ways out. The readings indicate that the channel to the left is exactly as wide as the submarine, but that channel leads to safety. The sonar equipment has a margin of error of 3%. If you attempt the passage and do not make it through, you will not have time to back out before Dr. Maybe enters the other channel and seals your fate. Sonar indicates that the other channel is twice as wide as the submarine, but it leads back towards the second submarine. If you take that channel, you may not have time to exit and come around before Maybe takes an easy shot at your broadsides. You have at most twenty seconds to make a decision. Any longer and Dr. Maybe will be in position to seal the right channel with a second torpedo blast.

What do you decide?

*Experiment #2.* Imagine you are a prehistoric human. Your clan has been devastated in a recent fight with a new alien clan over hunting grounds. It is winter, and as far as you know, you are the only one left. Food supply is very limited. You are hungry and getting hungrier. In your hand is a sharpened stick. From your vantage point you can see the hindquarters of a wild boar hanging from a tree. It is loosely guarded by one of the youths of the alien clan. There is enough meat there to sustain you for the few days it would take to climb over the small mountain to the next valley. Stories around the campfire say that the next valley is lush with food and unoccupied by humans. In your own clan, the Chief of the Tribe had the power to take food from one family

unit and give it to another. If you were caught taking food from another family unit without the Chief's blessing, you would be severely beaten. If you were caught twice, you would be banished. Outsiders captured by your clan were first beaten and then enslaved. Survivors who accepted their fate were eventually accepted into the tribe, but the strongest males were usually tortured to death. You do not know the ways of this clan.

What do you decide?

*Experiment #3.* Imagine you are a lumberjack in the Amazon rain forests. You've been offered a job cutting trees by the acre. You and your family need the work. You are aware of the claims that the world's ecological system could be irreversibly affected by the wholesale destruction of this oxygen producing forest and that hundreds of species of plants and insects, and thousands of subspecies, are being extinguished as the acres of rainforest disappear. You are also aware that claims as to the nature and degree of ecological damage are not yet proven, you know that someone else will take the job, and you are not sure of what is really meant by hundreds of species or thousands of subspecies.

What do you decide?

Would it make any difference if you were an office worker in a different country offered a job with a furniture manufacturer who annually buys a small part of the cut crop?

### *B. The Analytical Context*

The purpose of this essay is to explore the relationship between physical rules of survival and the rules of human conduct. The first three thought experiments are intended to highlight some of the issues. Prior to writing, I began with two principal observations, that (i) humans hold a variety of views as to what constitutes correct behavior, and (ii) humans live in a physical world which runs according to physical rules. I would like to know what these two factual observations have to do with each other.

What I see is a potential physical connection between survival and our notions of morality. Free will lies somewhere along the line of that connection. What I am looking for are the forces, if any, acting on humans which determine or influence the rules we adopt, and the limits, if any, on the kinds of moralities we ought to adopt if we are to physically survive.

When I examine rules of human conduct, I discover that such rules describe acts of human will. Examples of such rules include social norms, legislative acts, common law rules, and personal rules

of conduct. I can describe these rules as acts of will intended to be applied to other acts of will to achieve an objective. We connect this process with our notion of values. We describe these values by various names, such as customs, principles, policies, and moral worth. Values and "objectives" appear to be relative and subjective. They appear to be things which are in our heads.

When I examine rules of physical conduct, I discover that such rules describe physical forces, such as the force of gravity. We don't usually connect physical rules with our notion of values or with acts of will. We do not usually say that a physical force has an objective. Instead we say that physical forces apply to objects, and we connect the rules with their objective effects or physical consequences. Physical forces appear to be things which are outside our heads.

I can summarize these two relations as follows, and then ask if there is a connection between them. If there is a connection, then physical forces may shape human rules:

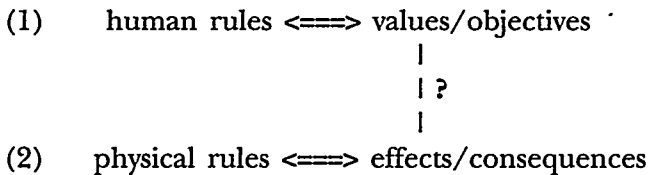


Figure 1

With life forms other than humans, the connection seems straightforward. The squirrel buries an acorn for the winter. Burying acorns can be described as a rule which offsets the physical effects of winter and hunger, relative to squirrels. Survival appears to be an objective<sup>14</sup> and acorns appear to be a value in support of that objective. The value of an acorn will change if some other food supply enters the picture, or the objective changes. Not every animal buries acorns.

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<sup>14</sup> "Objective" in this context means outcome or consequence of the process. See definition of "objective end" *infra* Part IV.B. Free-willed humans may consciously pursue objectives or unconsciously achieve objective ends. Non-free-willed organisms may be able to pursue the objects of their desire, such as food, but it is unlikely they can conceptualize a concept such as survival. Survival becomes a consequence of their actions.

A sequence of events can be seen. Physical events occur. Living organisms encounter these events. They respond in some way. They do not all respond in the same way. Physical conditions determine which responses work. Over time, organisms develop internal rules in response to physical events which, if followed, produce actions which support survival. From this sequence, two physical conditions relative to squirrels, winter and hunger, appear to influence rules of conduct and their associated values in light of an objective. It appears that these rules and values become encoded in the squirrel's brain.

I observe that the process can work in the other direction. Desires produce conduct in accordance with rules which are internal to the brain. The conduct produces consequences in the physical world in accordance with physical rules which are external to the brain. The beaver builds a dam which floods the meadow. Several objectives relative to the beaver are achieved in the process: underwater passages across what used to be a meadow, a nesting site for raising the young, and a fortress against predators. An underlying objective appears to be survival.

I observe that the squirrel's process and the beaver's process are linear with respect to time. One event follows another. They are also cyclical. Steps in the process occur repetitiously. The linear aspect gives the impression that time and events are going someplace. The cyclical aspect gives the impression they are going no place at all. I make this point to counteract the idea that there is necessarily a subjective purpose to the process of survival. The landscape is changing, but if there is any purpose in it, it has to be demonstrated.<sup>15</sup> The process may work like a repetitious chemical reaction.

If I ignore for the moment the higher brain functions of humans, this simple animal-like connection between the two rela-

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15 Metaphysical or religious theories may identify a subjective purpose. The entire physical system may also be programmed toward an end or a general set of conditions, even if there is no subjective purpose involved. See generally RENATO DULBECCO, *THE DESIGN OF LIFE* (1987); ERNST MAYR, *TOWARD A NEW PHILOSOPHY OF BIOLOGY* (1988). If life functions like a game of chance, such as repetitiously throwing a pair of dice, there may be a statistically determined *pattern* which necessarily results even though individual events cannot be determined. See generally F. DAVID PEAT, *EINSTEIN'S MOON, BELL'S THEOREM AND THE CURIOUS QUEST FOR QUANTUM REALITY* 54-58 (1990) (describing statistically determined pattern of light interference); JIM BAGGOTT, *THE MEANING OF QUANTUM THEORY* 29-30 (1992); NICK HERBERT, *QUANTUM REALITY* 95-97 (1985). To what degree there may be a connection between quantum mechanics, events in the brain, and evolution is undetermined.

tions in Figure 1 appears to apply equally to humans. We store food and we build shelters in response to physical events. We act aggressively and we nurture our young. We have presumably been doing these things since before the time we developed or received free will.

One version of the “linear cycle” I see in humans goes like this:<sup>16</sup>

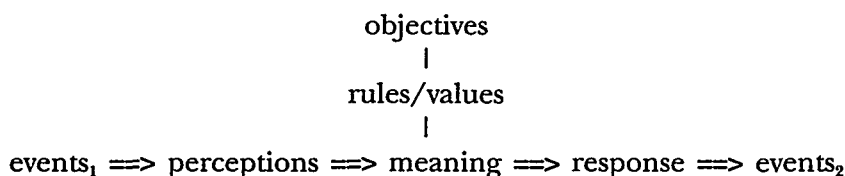


Figure 2

As with squirrels, rules and values tend to be shaped by the events we experience. The operation of this linear cycle is reactive. It's like heading for the exit when the fire starts. In such a circumstance survival would appear to be the objective. A door would be valuable. The objectives come from somewhere. We need to know more about the sources for the objectives.

Another way of looking at the same linear cycle is to change the order by starting with the meaning of events instead of the events themselves:

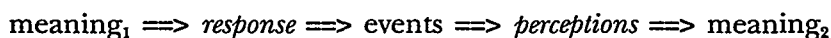


Figure 3

Figure 3 requires imagining the five base steps in Figure 2 as a circle, then breaking the circle at a different point and laying it

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<sup>16</sup> Drawings such as these are conceptual devices only. They do not represent a specific scientific theory.

out linearly in time. If I replace the two italicized words, *response* and *perceptions*, with two other words, *action* and *reflection*, and add back in rules, values and objectives, I get:

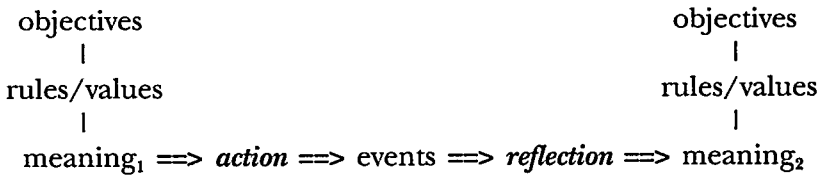


Figure 4

The operation of the linear cycle is now proactive. It starts with a desire in light of an objective. The desire triggers an action in accordance with a rule. Some view of events is presupposed. It's like a wolf pack starting to hunt, or a submarine commander who sends out a sonar signal. The results come back to us in the reactive mode. If the answers we get are not what we expect, the physical encoding of rules and values which are in our heads may change. We need to know more about where desires come from and what type of force they generate within the brain.

The proactive mode has an advantage over the reactive mode relative to survival. It offers an animal the opportunity to initiate actions and experiments, rather than leaving the animal dependent on the chance flow of events to which to react. Animals with legs can go looking for food. The experimental aspect, however, without some way of directing it, is still dependent on the animal chancing onto an experiment. Random unplanned trial and error is a slow process. An animal without the higher brain functions of a human may not even notice the reaction of events to an unplanned experiment.

If I now add one or more internal subroutines (X) to the brain which are not directly dependent on external events, but which are indirectly related to them through a process of interpretation and decisionmaking, then meanings, rules and values may change internally before the brain commits to an action. Depending on how versatile the subroutines are, objectives of the brain may be able to be changed as well. If humans become aware of what is happening, then reaction of events to random experiments are more likely to be noticed. Experiments might begin to take

place more frequently, and become planned and directed. Consequences to oneself will be recognized and self-conscious objectives can be adopted. If meaning, rules, values and objectives change, modifications in the actions which would have occurred are likely to take place. The process of changing actions has advantages relative to survival. Events can be structured:

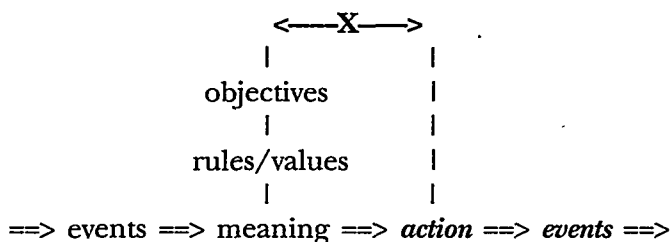


Figure 5

Let X in Figure 5 stand for the higher brain functions of a human. How freely meanings, rules, values, objectives and actions can change depends on how free X is from the physical sequence of both external and internal physical events. Animals without the higher brain functions of humans appear to be generally limited to their instinctual and trained responses.<sup>17</sup>

An example of the transforming effect of X in humans and the degree of our disconnection from real events is found in our ability to contemplate and act on hypothetical events rather than real ones. I can picture a new building or imagine a purple cow. I can make decisions based on hypothetical situations, such as our three thought experiments. These decisions might change an action which would otherwise have occurred.

If I can contemplate an existing value or objective which is physically encoded in my brain, I can change it or override it through an act of will.<sup>18</sup> The degree of difficulty I have at times in doing this shows how physically powerful the rules and values which become encoded in my brain can be. Even if I fail to change existing values or objectives, I can alter outcomes by add-

<sup>17</sup> See *infra* note 73.

<sup>18</sup> Memory, instincts and trained responses are examples of such encoding. See generally ECCLES, *supra* note 2; PRIBRAM, *supra* note 2.

ing new objectives and values to the system.<sup>19</sup> Improvements in the system relative to survival can theoretically be made or objectives unrelated to survival can be established. Conflicts of various kinds can be created or resolved. Whether or not conflicts occur, balancing between values may be required in order to make a decision relative to an objective.

How X works determines how values and objectives change. How X works determines which future among many humans will actualize. The subroutines of X, as drawn in Figure 5, are not entirely disassociated from real events. Real events occur on both ends of the process. If the subroutines of X and the connections involved are all physical, then what we know or think we know becomes a *physical* factor, along with external events, in how values get changed. Ideas become objects and may exert forces of their own. The process may be predictable, if not predetermined.<sup>20</sup> If we have free will, then by definition we can change values and decisions in an unpredictable way. The process may be indeterminate.

Since humans have to deal with both external and internal events, and since our assortment of objectives and values affects the actions we take to deal with them, it would be useful to know more about how X works. It would be useful to know what influences us to change our values and objectives. It would be useful to know what the physical processes are involved.

This brings me back to my original two relations in Figure 1. What influence do physical forces and their physical consequences have on the rules of human conduct and their associated values and objectives? What function(s), in addition to moral contemplation, does X perform? What relationship do these other functions have to moral contemplation? In contemplating this problem, I observe that I have two connections to the physical world to explore. My higher brain functions are connected to the physical world through the physical sensations I receive and to which I

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19 I do not imply that contemplation is the only means by which new objectives and values enter the system. Insights and inspirations may enter the brain through contemplation or in some other way. See, e.g., JOHN FINNIS, *NATURAL LAW AND NATURAL RIGHTS* 59-73 (1980) (describing how we come to identify basic or self-evident goods). The process of artistic interpretation may involve their own routines.

20 The throw of a pair of dice is statistically predictable even if an individual result is not predetermined. The reaction of two billiard balls striking together is predictable and predetermined.

respond. My higher brain functions are also connected to the physical world through the physical history of my biochemistry.

When I ask what my responses to physical sensations as well as the history of my biochemistry tells me, my desire for feasible hypotheses prompts me to look for commonalities with other biochemical organisms. Although humans are different from other organisms, they are also similar in a number of ways. If I temporarily suspend my notions of moral worth and my notions of willful purpose, and ask what life forms do in common, the reflection I get back from the physical world is that life forms survive. It is not all that they do, but they all do that. The survival process, absent free will, appears to be fully describable by a set of physical rules and physical forces. The actions I see life forms take appear to be fully accounted for by the manner in which their biochemistries function in response to external and internal events. Perhaps the subroutines of X developed as an objective end or consequence of biochemical events, supplying a means for enhancing the prospects of human survival.

If I were to take the physical rules of survival as a subset of all physical rules, and add in what I do not know about the subroutines of X, then my original two relations become:

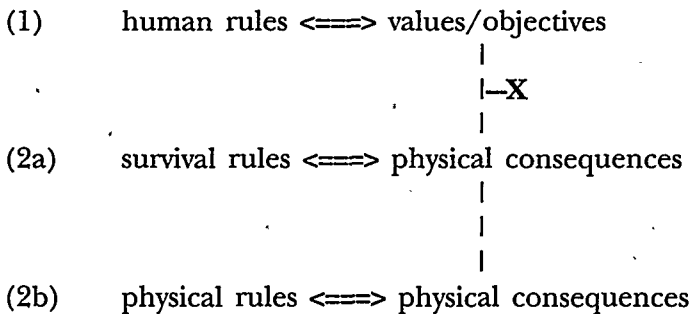


Figure 6

A fully detailed sequence of the steps it takes to translate physical consequences into rules of survival within the biochemistry of living organisms would look like the steps in a complicated chemical or "bioelectrical" problem.<sup>21</sup> On the other hand, the

21 See, e.g., PRIBRAM, *supra* note 2, at 132 (displaying a figure of a simplified sche-

results look a lot like human rules of conduct when we describe them using ordinary language: "the squirrel buries acorns for the winter." I observe that this statement about squirrels can easily be turned into a forward-looking rule warning of consequences by an organism capable of imagining hypotheticals: "the squirrel *ought* to bury acorns for the winter."

Assume for the moment that physical processes are objective and not subjective. If our thought processes are physically driven, then the process of translating or transforming a present factual statement into a future oriented "ought" statement may be physical.<sup>22</sup> This raises the question of what the physical rules of survival have to do objectively with shaping the rules of human conduct. Modern systems of morality, on the other hand, seem to focus on questions related to justifications. Is it morally justified to store food? Is it morally justified to store food which is currently in the possession of someone else? Since storing food supports survival, this would seem to necessarily raise the question of whether it is morally justified for life forms to survive. Or, with respect to our species, can it be said that humans ought to survive? As a moral issue, this question appears to be subjective and evaluative. If the question is treated not as a moral issue, but as a question related to the probabilities that humans will survive, then the question becomes objective. What does the objective have to do with the subjective?

The answer to the last question appears to lie in the operation of the subroutines of X. How connected or disconnected is free will from the physical world?<sup>23</sup> Do the moral conditions we tend to attach to human behavior reflect any facts about the physical world or do they represent only the attitudes which develop in our minds? Are any of our moral rules derived from physical rules? At its base, this essay is an effort to identify the objective and subjective elements involved in the formation and handling of

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matic of hypothetical memory trace circuit for discrete behavioral responses learned as adaptations to aversive events). See generally THE SYNAPTIC ORGANIZATION OF THE BRAIN (Gordon M. Shepherd ed., 1990); HARUN K.M. YUSUF, UNDERSTANDING THE BRAIN AND ITS DEVELOPMENT. A CHEMICAL APPROACH (1992).

22 See generally PRIBRAM, *supra* note 2, at xxii-xxix (describing theory of constructivist transformations of perceptions in the context of realism).

23 A primary source of connectedness is energy. All physical matter can be reduced to various combinations of materialized energy. See generally FEYNMAN, *supra* note 4. We will be discussing in this essay how some of these material manifestations of energy relate to each other.

rules of human conduct, and to relate those elements to the process of human survival.

### C. *The Is/Ought Relationship*

Since I purport to develop an objective morality, derived from factual observations, it is appropriate to quote here a passage by David Hume on the apparent futility of such an undertaking:

In every system of morality, which I have hitherto met with, I have always remark'd, that the author proceeds for some time in the ordinary way of reasoning, and establishes the being of God, or makes observations concerning affairs; when of a sudden I am surpriz'd to find, that instead of the usual copulations of propositions, *is*, and *is not*, I meet with no proposition that is not connected with an *ought*, or an *ought not*. This change is imperceptible; but is, however, of the last consequence. For as this *ought*, or *ought not*, expresses some new relation or affirmation, 'tis necessary that it shou'd be observ'd and explain'd; and at the same time that a reason should be given, for what seems altogether inconceivable, how this new relation can be a deduction from others, which are entirely different from it. But as authors do not commonly use this precaution, I shall presume to recommend it to the readers; and am persuaded, that this small attention wou'd subvert all the vulgar systems of morality, and let us see, that the distinction of vice and virtue is not founded merely on the relations of objects, nor is perceiv'd by reason.<sup>24</sup>

In shortened form, the is/ought distinction states that you cannot derive a statement of how things *ought* to be from descriptions of how things *are*.<sup>25</sup> How things ought to be are matters of

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24 HUME, *supra* note 4, at 469-70.

25 A number of efforts have been made to defend, overcome, discredit, circumvent, avoid or explain the is/ought distinction, also referred to as the naturalistic fallacy or fact/value disparity. See generally THE IS-UGHT QUESTION (W.D. Hudson ed., 1969); BRINK, *supra* note 2, at 144-70; FINNIS, *supra* note 19, at 33-42; RICHARD A. POSNER, THE PROBLEMS OF JURISPRUDENCE (1990), HILARY PUTNAM, REALISM AND REASON 229, 229-47 (1983) (why realism can't be naturalized); STEPHEN TOULMIN, THE PLACE OF REASON IN ETHICS (University of Chicago Press 1986) (1950); WALKER, *supra* note 2; Arnold Brecht, *The Myth of Is and Ought*, 54 HARV. L. REV. 811 (1941); John Finnis, *Natural Law and Legal Reasoning*, in NATURAL LAW THEORY 134-157 (Robert P. George ed., 1992); Stanley Fish, *Almost Pragmatism: Richard Posner's Jurisprudence*, 57 U. CHI. L. REV. 1447 (1990) (book review); Lon L. Fuller, *Human Purpose and Natural Law*, 53 J. PHIL. 697 (1956), reprinted in 3 NATURAL LAW FORUM 68 (1958); Moore, *supra* note 2; Ernest Nagel, *Fact, Value, and Human Purpose*, 4 NATURAL LAW FORUM 26 (1959); Jeremy Waldron, *The Irrelevance of Moral Objectivity*, in NATURAL LAW THEORY 158-87 (Robert P. George ed., 1992);

preference, matters of subjective will, or matters derived from sources other than by reasoning from observations of the physical world. Normative rules cannot logically be deduced or inferred from descriptive rules or from scientific facts or principles.<sup>26</sup>

I will address the is/ought distinction at various points in this essay. Under the rules for constructing a deductive syllogism, if the conclusion of the syllogism is an ought statement, then at least one of the premises must also be an ought statement. For a realist,<sup>27</sup> the premises and the conclusion must also reflect conditions in the real world if the real life integrity of the syllogism is to be maintained. This means that it is most important to explore the nature and source of our premises, and their realistic connection to a conclusion.

It is here that I think the is/ought distinction may be misleading, although not in and of itself invalid. Generalizing, the distinction asks, what are the bases for both our conclusions and our premises, and are these bases valid? The is/ought distinction is misleading because its scope related to the kinds of inferences which can rationally be made is more limited than its words suggest, particularly in its shortened form. The distinction needs to be qualified. Some inferences from *is* to *ought* may be valid. The distinction is not in and of itself invalid, because some inferences from *is* to *ought* may not be valid.

An example of a deductive syllogism which follows the rules for constructing such syllogisms is as follows: All trees are green. This is a tree. Therefore, this tree is green. Deductive reasoning takes the general form of a mathematical certainty because it follows rules which work like mathematics.

If I rationalize the syllogism to physical reality, however, the statements of the syllogism change to: All trees *were* green (the last time I checked). This *is* a tree. This tree *ought now* to be green. "Ought now" in this context conveys one of our general assumptions about the physical world: that the rules which describe the physical world do not randomly or suddenly change. "Ought now" also conveys one of our general conclusions about the physical world: that outcomes of physical processes are in some measure predictable, even if that measure is statistical probabilities. They

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Kenneth I. Winston, *Is/Ought Redux: The Pragmatist Context of Lon Fuller's Conception of the Law*, 8 OXFORD J. LEGAL STUD. 329 (1988).

<sup>26</sup> HART, *supra* note 1, at 182-83.

<sup>27</sup> See *supra* note 1.

are predictable because physical processes produce sequential events which are connected to each other through time. If all trees were green yesterday, and if nothing changes, this tree ought to be green today. We rely on these connections to make deductive inferences about what ought to be the case now.

In theory, if we know what physical process took place, and if we know all the facts upon which that process acted, then we can predict outcomes with mathematical certainty or with statistical certainty. Where we are missing some facts, but know the general physical rules which can explain the missing facts, then we make inferences about what *ought* to be case with respect to those missing facts. We make these inferences based on *our* assessment of the likelihood that certain events took place or that certain processes were engaged that explain the results, *given* the general rule. Such inferences take the form of intuitive assessments of the probabilities that are involved in the physical processes which took place.

We constantly rely, and of necessity must rely, on such inferences to make decisions, because we often do not know with certainty what the relationship is between two events.<sup>28</sup> The validity of such reasoning depends on the accuracy of our perception about the possible or probable relations between known and unknown entities or attributes. These possible or probable relations are described by the probability distributions associated with physical processes.

Such reasoning routinely combines inductive inferences with deductive ones. We use inductive reasoning to develop general rules about physical processes from particular facts.<sup>29</sup> If we know

28 This is typical of jury decisions. Juries intuitively assess the probabilities that event A or event B happened, based on an intuitive grasp of the general rule(s) which apply to such circumstances.

29 This is typical of scientific hypotheses. We ordinarily attempt to "verify" our inductive inferences about physical possibilities through empirical studies. We develop a general rule upon which we come to rely. Once given a general physical rule, probability assessments about outcomes are possible based on that general rule. It may be that the general rule itself (the inductive inference) has no ascertainable probability associated with it. See Lakatos, *supra* note 2, at 91-96 (empirical facts do not prove scientific propositions). Compare John Dewey, *Logical Method and Law*, 10 CORNELL L. Q. 17 (1924); Moore, *supra* note 2, at 1106-16. What I am suggesting is that it is reasonable to rely on such general rules based on their ability to explain observable consequences, even though the general rules as we perceive them will change when consequences arise which cannot be explained. But see PUTNAM, *supra* note 25. The brain appears to function pragmatically in light of practical exigencies. That some devised rules do not work and some do, suggests that there are limiting factors, or constraints, in the physical world relative to an objec-

something about a shade of red, and something else about a shade of blue, then we may be able to make an inductive leap to a general proposition about all shades of red or all shades of blue or about light or color or whatever else is possibly related to what we know about red and blue. If we know something about apples and oranges, we may be able to say something intelligent about bananas, or about all fruits. Once we have constructed a general rule (or proposition), we use that rule to deduce ought statements (probability assessments) about other particular cases.<sup>30</sup> Our inductive inferences may be in error, in which case our deductions may be in error. Then again, our inductive inferences may be valid, or at least viable.<sup>31</sup>

We extend our logical inferences from the past into the future. Such future oriented inferences, like past and present ones, take the form of "ought" statements, as in "the sun *ought* to rise tomorrow." If we say, "the sun *will* rise tomorrow," we have spoken loosely. We do not really know that to be a fact. But if there are fixed physical rules for transforming or converting one thing into another, then a physical relationship exists upon which to base viable ought statements. That relationship is described by the probabilities associated with the physical events involved. There is a high probability that the sun will rise tomorrow.<sup>32</sup>

Hume questions the jump from *is* to *ought* because he claims the two concepts are "entirely different."<sup>33</sup> If he is right, then there may be no relationship between *is* and *ought* upon which to base any viable inferences. If he is wrong, then the *is/ought* distinction is invalid to the extent of that relationship.<sup>34</sup>

Whether the concepts are different or related depends on what the concepts are. And that depends on what we mean by the

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tive.

30 A related means of reasoning is by analogy. Cass R. Sunstein, *On Analogical Reasoning*, 106 HARV. L. REV. 741 (1993).

31 The distinction between validity and viability is that validity goes to the truth of a proposition, while viability goes to the practical success, or empirical workability, of an inductive inference. If an inductive inference explains *all* the known facts which relate to it, we can at least say it is viable.

32 We rely here on the same general assumption (continuity of physical rules through time) and the same general conclusion (fixed physical relationship between events). Future oriented inductive inferences remain possibilities with a reliance factor. A person driving a car relies on this reliance factor. Deductive inferences have probabilities associated with them taking the inductive inference or general rule as a given.

33 HUME, *supra* note 4, at 469-70.

34 Even if there is a relationship, the human brain still may not be able to perceive any valid or viable inferences.

word "is" and by the word "ought." In developing a theory of objective morality I will address three connotations of the word "ought," their relationship to each other, and to "is".<sup>35</sup>

The first connotation relates to *probability*, as in "the sun ought to rise tomorrow." The second relates to influencing decisions, as in "Gret ought not steal" or "the trucker ought not drive under that low bridge." The connotation here is "X ought to make a *decision* not to do Y, *because* . . ." There could be practical reasons unrelated to morality not to steal or drive under low bridges. This type of ought statement usually looks to the consequences of some action related to some objective. I will refer to these as rational oughts if there are physical probabilities connecting the ought statement to its consequences and therefore its objective. The third connotation of "ought" relates to our notions of *value* in general and *moral value* in particular. "The squirrel ought to bury acorns for the winter" is an example of a rational ought statement and an objective value statement because a buried acorn has a value relative to survival. "Gret ought not steal because it is wrong" is potentially an example of a subjective value statement, depending on what "wrong" means.

I will contend that the second and third connotations (both versions) of "ought" developed because of the way the human brain developed. They represent, at least in some cases, direct or modified transformations of physical oughts which were derived originally from the physical rules of survival. They reflect the physical rules of survival. An is/ought relationship potentially exists relative to each of these connotations. By acts of free will, however, humans can sever the connection between the rules of human conduct and the physical rules of survival. Nevertheless, all three connotations describe functions which potentially serve survival, even though I will conclude that the process of evaluating things is relative. Relativity does not equal subjectivity.

It may be that the is/ought distinction as generally used is intended to apply only to the moral value version of the third connotation of the word "ought". We associate the word "ought"

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35 I observe that if Hume is right, we may not be able to use the word *is* at all. If I'm looking at the Statue of Liberty, can I say that Brooklyn *is* where I thought it was a minute ago, or for that matter, *is* the Statue of Liberty where I think it is? All I can really say is that these two things *ought to be* there. We have really only future oughts merging into past ones. Or, more conventionally, inferences based on the past are used to project the future.

with the word "morality." We associate the rules of a morality with value judgments. We have come to associate value judgments with subjectivity. Value judgments are suspect under the is/ought distinction, because we believe there are no valid connections between subjective values and objective facts. Exploring the connection between subjective values and objective facts goes to the heart of my inquiry.<sup>36</sup>

### III. OBSERVATIONS ABOUT THE PHYSICAL WORLD

#### A. *A Theory of Beginnings*

According to one theory of the physical world, the universe began as a point in empty space. There was no physical matter. At zero hour, that point exploded. Immediately thereupon there was an enormous outflowing of high octane energy. Within a few seconds free energy began to convert into physical matter. The first subatomic particles were born.<sup>37</sup>

The questions to ask are: what sort of thing is energy, and what is its source?

#### B. *The Next Steps*

Within a few minutes, subatomic particles and free energy began to combine to form larger material objects. These larger material objects eventually formed into a variety of things we call stars and planets. The behavior of stars and planets is described by the laws of physics and thermodynamics. In between the first few minutes and the formation of stars and planets there were intermediate steps. Afterwards, there were subsequent steps.

Both the intermediate and the subsequent steps involved the formation of atoms followed by the formation of molecules. Matter is a materialization of energy, as described by Einstein's formula;

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<sup>36</sup> I do not deal with a fourth connotation of "ought" which relates to "obligation," although this may be the most common understanding of the applicability of the is/ought distinction. I treat our sense of obligation to conform, and our desire to conform, to rule X as instinctual or trained responses. As such they are physical rules encoded in our brains which become associated with other authoritative rules. They can support survival, but they can also become associated with rules which do not support survival. Our sense of obligation and desire to conform have to be assessed like our sense not to steal has to be assessed.

<sup>37</sup> See generally Steven Frautschi, *Entropy in an Expanding Universe*, in ENTROPY, INFORMATION, AND EVOLUTION (Bruce H. Weber et al. eds., 1988); STEVEN WEINBERG, *THE FIRST THREE MINUTES* (1977).

$e=mc^2$  (energy equals mass times the speed of light<sup>38</sup> squared). Energy is stored in matter. Matter is a form of energy. Matter behaves according to the rules of energy. From zero hour on, and throughout the universe, atoms and molecules have been constantly forming, colliding, rearranging, and reforming. Energy, whatever it is, moves back and forth between stored states and free states during each of these reactions. Combinations of energy change. The behavior of energy in the form of atoms and molecules, like the behavior of planets and stars, is described by the laws of physics and thermodynamics. The laws of physics and thermodynamics are expressions of whatever it is that regulates energy.<sup>39</sup>

Draw a balloon around any part of the material universe, no matter how big or how small, and you have described a localized thermodynamic system.<sup>40</sup> A localized thermodynamic system is any arbitrarily defined volume of space with energy inside. An ice cube tray with water in it is such a system. Localized systems are temperature sensitive. The more heat that is added or which exists in a localized system, the more the system looks like a destruction derby. Take the heat out of a system and it freezes most molecular action. Large gangly molecules have little chance of developing or surviving on the surface of the sun because it is too hot. Large gangly molecules have fared better on the surface of planet Earth. Earth gradually cooled to the point where such molecules would remain stable.<sup>41</sup>

Temperatures on Earth cooled and then leveled out, staying within certain ranges. Molecules continued to form, rearrange, and reform. Some of these molecular reformations began to display a cyclical characteristic. Operating in association with other molecules and following repetitive chemical processes, a molecule would divide and two molecules of the same type would be formed. This was an early form of propagation. As the association of molecules became more complex, what we think of as life came into existence.<sup>42</sup> Provided the temperatures of the Earth and oth-

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38 The conversion factor,  $c$ , equals 186,282 miles/second, squared.

39 See generally FEYNMAN, *supra* note 4; GORDON M. BARROW, PHYSICAL CHEMISTRY (1966).

40 A car engine is an example of an inanimate thermodynamic system. Energy enters, work is done, and heat is released. See generally FEYNMAN, *supra* note 4; BARROW, *supra* note 39.

41 See, e.g., WILLIAM F. LOOMIS, FOUR BILLION YEARS: AN ESSAY ON THE EVOLUTION OF GENES AND ORGANISMS (1988) (with references to other authorities).

42 *Id.* See generally ENTROPY, INFORMATION, AND EVOLUTION, *supra* note 37. I accept.

er material conditions remain the same, life forms ought to continue to function along these lines.

If this is what happened, then the question to ask is: what sort of relationship exists between energy and life?

### C. *Some Observations*

For humans, it's the study of the intermediate and subsequent steps which makes the difference. The general formation and behavior of stars and planets is important, but the action of localized systems closer to home is more important. Our interests in things are relative. We make choices about which systems to study and how we want to study them. How we focus on things and what we focus on affects what we learn.<sup>43</sup> How we focus on things and what we focus on affects the decisions we make.

One of the ways we change our focus is by naming things. We call the closest star the "sun." Only occasionally do we call the sun a hydrogen furnace. Sometimes we call it our primary source of light. We call our neighbor "Gladys." We almost never call her a collection of several trillion organic cells. Sometimes we call her a member of society. The words we use signify the object we are perceiving in relation to other objects. We see things in their relative context through our own eyes.

Relativity, however, does not equal subjectivity, although there may be a subjective cast to the view. Einstein saw things in their relative, but objective, context when he observed that our perception of the laws of physics was relative.<sup>44</sup> Einstein demonstrated that the laws of physics as written in one frame of reference could be mathematically transformed into another frame of reference in accordance with the physical relationship between the two frames of reference. In other words, the laws of physics viewed from one perspective are the same laws when viewed from another perspective, although the expression of those laws will change depending on the perspective that is selected.<sup>45</sup>

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for the purposes of this essay, the premise that life developed from what we think of as inanimate chemical processes, with or without the aid of a subjective will. I leave the question open throughout the essay whether this applies equally to free will. I take no position on the question of whether there is a distinct human spirit.

43 See, e.g., THOMAS S. KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTIONS* (2d ed. 1970).

44 See generally EINSTEIN, *supra* note 4; FEYNMAN, *supra* note 4, at 15-1 to 16-8.

45 When I say that a glass is half empty, and you say it is half full, the two statements may tell us something about our subjective attitudes about the general state of

Changing our focus changes our perspective. It does not necessarily change the physical rules which apply to a system. This sets up the possibility that our rules of human conduct are in some way an expression of other rules which are expressed in different terms when viewed from a different perspective. We are looking for transformations.

*D. Distinguishing Inanimate Processes from Animated Ones*

Energy, whatever that is, was transformed into inanimate matter according to rules. Matter is an expression of the rules which describe energy. Matter was further transformed into life forms. Life forms, at least absent free will, are a further expression of the rules which describe energy. What is the physical distinction between inanimate matter and animated matter?

Reflecting on the inanimate processes of the physical world, I observe that the universe is expanding but the rate of expansion is slowing down. The hot spots are growing colder. The universe will reach a stage where it is very cold and very dark.

These facts do not seem particularly relevant to humans, at least in the short run. But another way of visualizing the process is to suggest that the inanimate world is winding itself down. Technically, energy is being transformed from more excited states to less excited states.<sup>46</sup> The sun is in an excited state. When it burns out it will be a frigid rock.

For inanimate processes, this process is constantly unidirectional. Taking the energy of the universe as a whole, inanimate processes spontaneously "move" in that direction which redistributes energy from more excited states to less excited states. The sun, as a localized system, does this by irreversibly releasing or dissipating its "excess" energy in the form of heat and light.

A localized thermodynamic system can and will move from a less excited state to a more excited state, but *only* by adding energy to the system. If you turn on an electric burner under a pot of water, energy in the form of heat moves from the burner through the pot and into the water. The water becomes excited. If you

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affairs as we individually see them. However, the two statements are objectively valid. The first statement is a statement of fact relative to empty glasses, while the second statement is a statement of fact relative to full glasses.

<sup>46</sup> See generally DANIEL R. BROOKS & E.O. WILEY, *EVOLUTION AS ENTROPY* (1986); *ENTROPY, INFORMATION, AND EVOLUTION*, *supra* note 37; JEFFREY S. WICKEN, *EVOLUTION, THERMODYNAMICS, AND INFORMATION* (1987).

remove the external source of heat, the water gradually cools down again. The cooling process is spontaneous and unidirectional. While the water is in an excited state, you can use the water to do some work. By continually adding energy to a system capable of storing and using it, the system can do work repetitiously.<sup>47</sup> Water based space heating systems and steam engines are examples.

The Earth is a localized system which has a continual external source of energy—the sun. The Earth also has an internal source of energy which is in an excited state—the molten core. Energy from these two sources continuously and spontaneously redistributes itself throughout the system. In the process, a variety of things happen.

One of the things which happen is earthquakes. Another thing which happens is the cyclical process of life.<sup>48</sup> Physically, both processes are obliged to function within the constraints imposed on them by the laws of physics and thermodynamics. In that sense, the two processes are the same. On the other hand, we can distinguish them.

Reflecting on the inanimate process of an earthquake, and treating it as a localized thermodynamic system, I observe that the earthquake works essentially like the interior of the sun. Energy is released spontaneously through the earthquake, as light is released spontaneously through the sun. They are both the direct result of forces within the system which produce the effect. Reflecting on the animated process of life forms, and treating them as localized thermodynamic systems, I observe that: (1) energy is taken into the system; (2) work is done *internally* with that energy; (3) excess energy is stored within the system; (4) the stored energy is later used to do work *on* the external world; and (5) residual energy is given off to the external world in a variety of forms, such as heat and other by-products.

At first these five factors may appear to distinguish living organisms from earthquakes. As general statements, however, all five factors appear to apply to earthquakes. Energy (pressure) enters the earthquake area over time, causing minor subterranean shifting. Energy is stored as tension, until the system reaches the breaking point, and the quake occurs. The quake does work on

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47 See, e.g., Frautschi, *supra* note 37, at 11, 12.

48 *Id.* See generally BROOKS & WILEY, *supra* note 46; ENTROPY, INFORMATION, AND EVOLUTION, *supra* note 37; WICKEN, *supra* note 46.

the external world (takes down buildings and freeways) and residual energy is given off as after shocks and tremors. We can see that the five factors also apply to the sun, if we consider that energy originally came into that particular location in empty space during the period in which stars and planets were formed. A comparison to tea kettles and steam engines reveals the same thing.

I am next tempted to try to uniformly distinguish animated from inanimate systems based on the type of work they do on the external world (4th factor). While this approach may help distinguish between different types of organisms (gophers and groundhogs do not build dams like beavers and humans do), it does not seem to uniformly distinguish animated systems as a class from inanimate systems as a class. Although the element of free choice may distinguish humans from earthquakes, how, with respect to the external work done, are organisms that eat oil spills and then die (transforming material objects in the process) fundamentally different from an earthquake which moves land around for awhile and then stops, or from a solvent which dissolves another compound until there is nothing left to dissolve? How are bacteria which speed the process of decay in a compost pile fundamentally different, with respect to the external work done, from an inorganic catalyst that speeds a chemical reaction?

A more uniform distinction appears to surface in the type of work an animated system does internally (2nd factor). The particular earthquake is never reconstituted, nor does it produce similar earthquakes. On the other hand, two of the fundamental things living organisms do, is to (i) reconstitute themselves and (ii) produce similar organisms. In particular, organisms grow in size, develop in accordance with certain patterns, routinely reconstitute damaged and worn out parts, develop defense mechanisms, and position themselves to do their share in propagating similar organisms. This is a general statement I will use for the physical process of survival. The rules are all physical.

I observe, as I did in the introduction, that the physical process of survival is both linear and cyclical. I observe further that whatever work may be done by an organism, either externally or internally, the ability to do such work is conditioned on the organism's continued existence.

#### IV. DEVELOPING A THEORY OF OBJECTIVE MORALITY

##### A. *A Visualization*

*Experiment #4.* A human is standing at the edge of a clearing. It is dusk. The cold night air creates a fine mist which dances on the tops of the grasses. A lone wolf enters from the back right side of the clearing, heading generally towards the back left side. The human watches the wolf move across the clearing. Half way across, the wolf stops and directs its attention towards the human. The wolf gazes quietly at the human for a few moments, and then continues on her way.

Count the number of relationships you see in this picture.

##### B. *Objectivity and Subjectivity; Objective Ends*

Having made general observations about the physical world, I will try to relate those observations more specifically to life forms. The purpose is to narrow our focus on how much of an animated system is objective and how much is subjective. Examining a life form with only one cell and comparing it to multi-celled organisms, including humans, will be helpful. In the process I will develop definitions of objectivity and subjectivity and define objective ends in terms of consequences.

Some single-celled organisms, such as amoeboid protozoans, periodically bifurcate into two separate and distinct single-celled organisms.<sup>49</sup> The process is influenced in large part by DNA molecules, which are contained within sub-cell structures known as chromosomes. Each DNA molecule contains thousands of coordinated groupings of atoms, which we call genes. A DNA molecule is a chain of specific subgroups of atoms. The sequencing of these subgroups, or genes, and the specific atom groups within the genes appears to equate to a set of instructions which guides the bifurcation (cell division) and controls the formation of the new protozoans.<sup>50</sup> The chain works like a computer code or computer punch tape full of instructions. Once formed, the new protozoans

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49 See O. ROGER ANDERSON, COMPARATIVE PROTOZOOLOGY 375-92 (1988); RENATO BASERGA, THE BIOLOGY OF CELL REPRODUCTION 46-58 (1985). See generally THE BIOLOGY OF AMOEBA (Kwang W. Jeon ed., 1973); MICHAEL A. SLEIGH, PROTOZOA AND OTHER PROTISTS (1989).

50 See generally DULBECCO, *supra* note 15 (general reference on the operation of DNA and genetics in the cell environment). See *infra* note 56 for a summary of the genetic coding within a double helix DNA molecule which guides the construction of a body.

begin to function according to the individual biochemical processes they were programmed to possess. They continue to function within the constraints of these processes and within the constraints of the general laws of physics and thermodynamics.<sup>51</sup>

Similar biochemical processes routinely guide and direct the development of living embryos, first into self-sustaining life forms, and then into adults of that particular type of animal. The number of cells in multi-celled organisms grows through bifurcation. Unlike protozoans, the cells in multi-celled animals remain together and operate as a unit. The human body grows by cell division into a coordinated and integrated array of thousands of billions of cells. For humans, this requires the mathematical equivalent of approximately 60 rounds of cell division, although some cells divide more often than others.<sup>52</sup> Physical differences between the various types of animals and between individual animals of the same type are traced in large part to differences in the size and structure of the DNA molecules, and in particular to the sequencing of atoms and genes within those molecules. In short, if you change the instructions coded in the DNA, you change the physical formation and physical operation of the animal.<sup>53</sup>

Related biochemical processes operate to maintain individual organisms. Replacing worn out cells is one example. Breaking down complex carbohydrates and producing and regulating the flow of proteins, amino acids and hormones are other examples. Enzymes are produced which catalyze biochemical reactions. Some of these processes depend on the structure of DNA molecules, while others may predate the development of DNA processes.<sup>54</sup> Maintaining an organism is not a once a week or once a month process. With humans, millions upon billions of such biochemical processes are occurring every minute in every body.<sup>55</sup> Some of these processes require thousands of associated chemical reac-

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51 See generally ENTROPY, INFORMATION, AND EVOLUTION, *supra* note 37.

52 The body has more than 10,000,000,000,000 (10 trillion) individual cells, each carrying on a life cycle of its own. Every minute about 3 billion cells die. 3 WORLD BOOK ENCYCLOPEDIA 326-39 (1990). See generally ADVANCED CELL BIOLOGY (Lazar M. Schwartz & Miguel M. Azar eds., 1981).

53 Behavioral differences are influenced by other factors in addition to DNA composition. See generally DULBECCO, *supra* note 15; ECCLES, *supra* note 2. For a summary description of the function of DNA and genetic codes, see *infra* note 56.

54 See generally LOOMIS, *supra* note 41, at 1-100.

55 The blood system alone looks like hundreds of Los Angeles freeways at rush hour, except that the traffic of the blood moves. Compare 3 WORLD BOOK ENCYCLOPEDIA, *supra* note 52.

tions.<sup>56</sup> Animal bodies are virtual beehives of complex but coordinated physical activity.

Of particular interest, in light of our general theme, are the related biochemical processes which guide and direct the development of the human brain. The brain consists of billions upon billions of neurons and associated cells.<sup>57</sup> Each neuron contains tens of thousands of locations, called synapses, which transmit electrical impulses from one neuron to another with the aid of thousands of biochemical reactions. The neurons are "wired" together in a complicated but physically coordinated network which extends throughout all parts of the body. This bioelectrical network operates around the clock, performing hundreds of interrelated functions which connect perceptions to responses. Various brain parts perform or support specific functions, such as receiving optical impulses from the eye or thinking. Other brain parts respond to physical stimuli or initiate physical desires to eat, sleep, have sex, or fight. Information is taken in, processed, and responses are generated. Many of these responses are actualized without conscious thought. The structure and operation of brain parts<sup>58</sup>

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56 Each human cell contains 23 pairs of chromosomes, which contain the human genes, as well as hundreds of other constituent parts. *Id.* Each cell has trillions of atoms. There are at least 30,000 human genes. ECCLES, *supra* note 2, at 1.

A gene is a sequence of base units which lie between the two strands of the double-helix DNA molecule. There are only four base units, referred to as letters: A, T, C, and G. Sequences of these letters constitute a gene. Linearly, the DNA molecule contains a large number of genes which act as instructions to the cell's activity. A principal activity is building proteins according to these instructions. The proteins which are built determine the shape and function of the body and its parts. *See* DULBECCO, *supra* note 15, at 1-41, 61-101, (machinery of the cell and DNA function); ECCLES, *supra* note 2, at 1-7.

A DNA molecule or strand of encrypted code in a bacterium has approximately 1.5 million letters (A, T, C and G). Each human DNA molecule has approximately 3.5 billion letters. *Id.* at 1; DULBECCO, *supra* note 15, at 100. Each chromosome contains a specific collection of DNA molecules with different sequencing of letters. Different combinations and sequences of letters define a single gene. Each letter represents a combination of atoms which maintain an identity. The different genes control different aspects of the body through a process of translating the encrypted code into different combinations of proteins. *Id.* at 70-83. The combinations and sequencing of the constituent part of genes can be modified by random error and other forms of mutation. These modifications account in large part for the diversity in life. *Id.* at 99-125.

Although the various cells are specialized, the operation of most cells can be analogized to that of a manufacturing plant with hundreds of separate assembly processes, along with the necessary raw material receiving and finished product shipping operations networked into the transportation systems of the body. *Compare* DULBECCO, *supra* note 15, at 1-41, 61-101.

57 *See generally* DULBECCO, *supra* note 15, at 339-70 (machinery of the brain); ECCLES, *supra* note 2; PRIBRAM, *supra* note 2 (extensive discussion and descriptions of dendritic microprocesses and networking within the brain).

58 DULBECCO, *supra* note 15, at 342-43. *See generally* PRIBRAM, *supra* note 2; THE SYN-

are at least in part a function of the instructions encoded within DNA molecules. Those instructions guided the construction, development and initial operation of the brain.

The point I want to make is that the biochemical and electrical processes of the brain appear to be *at least as objective* as the processes which control the bifurcation of single-celled organisms, or which control the bifurcation of cells in multi-celled animals, or which operate to maintain individual organisms. I make this statement even though the cumulative or coordinated operation of these brain-related processes produce or reflect a variety of patterns of behavior we ordinarily refer to as subjective. Included in such behavior are the adoption or affirmation of moral and other rules of human conduct.

What do I mean by "at least as objective?" What does "objective" mean, and what is the objective of the physical processes involved? Some discussion is required to answer these questions in relation to the general theme of the essay.

One effect or consequence of the bifurcation process of a protozoan is that there is one additional single-celled organism in the universe. We might ask what purpose is served by the production of this additional organism? Phrased in this way, this new question prompts our minds towards past, present and future settings in which protozoans find themselves. Our thoughts are directed to considerations of how protozoans relate to their surrounding environment, and to considerations of the history of protozoans particularly and the history of the physical world generally. We answer the question in context. We find that our orientation towards time becomes relevant.

Within the context of the physical world and its history, we observe that individual organisms eventually die. We observe that they die from a variety of internal and external causes and that the surrounding environment can be hostile. What we mean is that similar organisms have died in the past and appear likely to die in the future, and that the surrounding environment is one of the factors determining life or death.

Bifurcation, or cell division, seems to have no direct consequence for the individual protozoan, outside of the act itself, but without bifurcation or an equivalent process there would eventually be no protozoans. I generally conclude that a central effect or

consequence of bifurcation is *perpetuation* of that particular type or *species* of protozoans. I note that this process requires the current generation to produce the next generation.

I might next be persuaded to identify the word "effect" or "consequence" with the word "purpose," regardless of any other effects, consequences or purposes protozoans may have or may serve within the physical world. In thinking this through, I make a mental note that the word "purpose" has a connotation which needs to be dealt with. By a similar process I conclude that a central effect or consequence of the internal biochemical processes which sustain protozoans is *prolongation* or reconstitution of *individual* protozoans, regardless of any other effects or purposes these particular protozoans may have. If the only effects are prolongation of the individual and perpetuation of the species, then there are no other questions. If there are other effects, then the existence and significance of other "purposes" becomes an open question with which we must deal.

The problem with the word "purpose" is that the word usually connotes intention. Intention often connotes a subject who has designed or intends an outcome. Since the involvement of subjects goes to a central part of my inquiry, I need to keep the various connotations of the words I use distinct. I will therefore dispense with the word "purpose" except where the word's objective or subjective connotation is clear from the context.

With the workings of our protozoan in mind, definitions of *objectivity* and *subjectivity* are in order. As a working definition, I will say that a process is *objective* if, after it is set in motion, it operates without the immediate support or aid of a free willed subject and produces material or physical results. The physical results of an objective process are its consequences. Each consequence is an "objective end." An objective end is a classifiable set of consequences. Where there is a physically based process at work, the language and concepts we ordinarily use allow me to characterize that process by reference to one or more of its consequences or objective ends. I recognize that such characterizations may only partially reflect the total operation or effects of the process. I observe that objective processes may also be designed or used by free willed subjects, in which case it is the design or use, not the process itself, which is subjective.

I further observe that the consequences of objective processes may trigger other objective processes which have their own material and physical effects, thus creating a chain of objective events. I observe that the consequences of objective processes, like the design and use of such processes, may create opportunities for subjective actions by subjects capable of taking such actions.

While it may be grammatically correct to refer to behavior as subjective any time there is a grammatical subject, what I mean here by *subjective* behavior is that the subject involved has the ability to freely decide between alternative actions. Rational thought processes which generate suggestions for alternative actions may be physical. The direction given to rational thought by act of free will is subjective. This may be a narrow definition of subjectivity. It is to this definition I intend to refer when I use the expression "free will."

To illustrate the objectivity/subjectivity distinction, the production of the second protozoan in some manner consequentially affects the overall demand for protozoan food and the quantity and composition of the chemicals in the surrounding environment. Although I may say this will have a subjective effect on the future of protozoans, this is loose talk. What I mean is that particular entities, protozoans, will be particularly but objectively affected. The fact that protozoans may respond in a variety of ways to the new state of affairs does not make those responses subjective. Protozoans, as far as we know, do not have the ability to freely decide how to respond to changing circumstances.<sup>59</sup> Therefore, protozoans do not have subjective opportunities for action. As far as we know, the responses of protozoans are either randomly determined or specifically dictated by internally established patterns of responses to physical stimuli or both. If the pattern of the response is specifically determined, the process works like one billiard ball striking another, generating a single objective outcome. If the response is random, the process may work like throwing dice. Although we won't know the specific outcome until after the event, there may be a statistically predictable distribution of physical responses.

Another way of describing the consequences which proceed from the introduction of the second protozoan into the physical

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59 See generally ANDERSON, *supra* note 49 at 375-92; THE BIOLOGY OF AMOEBA, *supra* note 49; SLEIGH, *supra* note 49.

world is to say that the entire balance or configuration of the universe has just changed—albeit only “at the margin.” The objective effects on humans of this single marginal change are likely to be inconsequential. But I observe that the unchecked objective consequences proceeding from a single marginal event might be more dramatic (at least for humans) if the particular organism involved was an AIDS virus. I similarly observe that a single nuclear explosion in any one of a number of locations would have its own specific set of dramatic consequences.

Humans, unlike protozoans, are said to have free will. In such a case, I can see that objective consequences, past or future, create subjective opportunities for actions by humans. Humans can take advantage of the consequences they like or freely do something to forestall or counteract consequences they don't like.<sup>60</sup>

Returning to the issue of the biochemical processes operating within the brains of humans, and in light of our discussion of protozoans, objectivity and subjectivity, and our general knowledge of the history of the physical world, I conclude the following. If there is a physically based process at work within humans, then there *may* be one or more objective ends for the process even though the process creates opportunities for subjective action. I am further prompted, by inferences drawn from our general knowledge of physical processes, to say that there *ought* to be such objective ends, *because* I am not aware of any physical processes that do not produce material or objective consequences. Accordingly, I seek to discover what those objective ends *are*.

Observing that physical processes produced mechanisms within other life forms which sustain, defend and propagate those life forms (survival mechanisms developed through adaption, training and DNA modifications),<sup>61</sup> and accepting the premise that the human brain has developed in stages over time, I *conclude* that one of the objective ends of the physical processes of both the lower and the higher level brain functions is to enhance the prospects of physical survival.

I observe that these processes include such things as desires, wants, needs, sensory perceptions, emotions, instincts, trained responses, memory, consciousness, speech, imagination, rational

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60 Humans are limited to efforts to forestall or counteract objective consequences. We cannot physically undo them. If efforts to forestall or counteract events do not work their intended purposes, objective consequences will take their full effect based on the physical probabilities involved.

61 See generally MAYR, *supra* note 15.

thought, artistic expression, moral evaluation, religious expression and free will.<sup>62</sup> A number of these processes appear to be physical. They appear to be the objective consequences of how energy reacts to energy. I remind myself that objective processes may be used for subjective purposes and may have other objective ends.

I offer as circumstantial evidence to support my conclusion (that the physical processes of the brain enhance survival) the fact that the human species continues to survive after millions of years, that humans appear to dominate most other species, and that the physical processes of the human brain appear to have contributed to the relative success of the human survival system. If the human species becomes extinct as a consequence of its objective or subjective use of its mental capacities, then I would probably have to conclude that the higher level mental processes of the human brain were not a long-run enhancement relative to physical survival.<sup>63</sup>

The question remains whether the process of adopting rules of human conduct is part of the objective processes of the brain. If so, modern rules of moral conduct, or at least some of them, may be an expression of the physical rules of survival as described in the general biochemistry of living organisms.

### C. *Rules of Human Conduct*

What do the rules which describe the behavior of physical objects have to do with the rules of conduct devised by humans? To bring out the underlying issues, I will explore the relationship between descriptive and normative rules of conduct. The purpose of this section is to show that a continuum of rulemaking processes may exist, with descriptive rules at one end and normative rules of human conduct at the other.

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62 The conceptual dividing line I am using is that line which generally distinguishes humans from other living organisms. Rationality, consciousness, the ability to communicate syntactically, and free will are higher level brain functions. The point at which humans began to tell stories around a campfire and to draw pictures on the walls of caves probably points to the transition period. Compare *Thought Experiment #2*, *supra* Part II.A. See generally CHARLES J. LUMSDEN & EDWARD O. WILSON, GENES, MIND, AND CULTURE (1981); CREATIVITY/ANTHROPOLOGY (Smadar Lavie et al. eds., 1993); HUNTERS AND GATHERERS (Tim Ingold et al. eds., 1988) (in two volumes); USE OF TOOLS BY HUMAN AND NON-HUMAN PRIMATES (A. Berthelet & J. Chavallion eds., 1993); WILSON, *supra* note 4.

63 I exclude the lower brain functions because such functions have a much longer history of functioning successfully with respect to non-free willed organisms. See *supra* note 62.

The distinction I draw between descriptive rules of conduct and normative rules of conduct is essentially one of volition. The law of gravity is an example of a descriptive rule of conduct. Our mathematical formulation of the law of gravity describes, within some margin of error, the effects of the actual force of gravity on material objects. In the absence of all other intervening forces, whether gravity is viewed as emanating from matter or is viewed as acting independently on matter, and taking the material attributes of the objects involved as given, the force of gravity so described can be said to absolutely control the future behavior of those objects. The law of gravity describes one of the ways in which objects in the universe are physically connected to each other through time.<sup>64</sup> No decision is involved, nor is any decision relevant, even if one of those objects is a human.

An example of a normative rule is "one ought not steal." Such an expression is not ordinarily intended to describe a force which acts independently and absolutely on material objects. A person might steal despite the rule. All that is apparently required is the taking of an action in contradiction to the rule. One cannot so defy the force of gravity, although one can take an action which counteracts it.<sup>65</sup>

Our purposes in formulating or expressing normative rules are usually different than with descriptive rules. We might say that we intend normative rules to describe correct behavior. If so, the various connotations of the word "correct" will have to be unpacked since "correct" necessarily refers to some undefined set of criteria. This concept of criteria for correctness will later become central to our inquiry into objective morality. One of the things I think we commonly mean to do when formulating the words of a normative rule is to describe a rule or standard the knowledge of which is intended to influence a decision. I will refer to this as the *first*, or *influencing of conformity*, use of a normative rule. As a separate matter, and under some circumstances, we also employ the rule as a measure of an attribute we refer to as the "moral worth" of an action or an actor. I will refer to this as the *second*, or *evaluative*, use of a normative rule.

The predicate for the first intended purpose of a normative rule is volition by someone capable of making a choice in light of, or in recognition of, the existence of the rule.<sup>66</sup> Questions of

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64 See generally FEYNMAN, *supra* note 4, at 7-1 to 7-11.

65 For example, opening a parachute within the earth's atmosphere.

66 As to a specific notion of a rule of recognition, see HART, *supra* note 1, at 92-

moral worth do not need to enter the picture.<sup>67</sup> However, if the actor is not aware of the rule or lacks free will, the rule as a conscious matter cannot serve its intended purpose of guiding or influencing behavior in conformance with the stated norm.<sup>68</sup> In this view, a normative rule does not describe a force which strictly controls objects, as does gravity. We avoid stealing by deciding not to steal, and then not stealing.

The predicate for the "moral worth" or evaluative use of a normative rule is ordinarily an action or an inclination to act in opposition to, or in fulfillment of, a prescribed or proscribed conduct. I observe that some humans will withhold moral assessment where the actor acts without free will or without recognition of the moral rule. Under such circumstances, the act is treated as morally neutral and the actor is not held morally deficient. On the other hand, some humans in the same circumstances will assign a negative or positive moral worth to the act or the actor, regardless of the actor's state of mind. The act itself is a negative act, or the act itself is a positive act. In this latter situation we have disassociated moral worth from volition.

It is our ability to change, apparently at will, the location and conditions of the attribute we call "moral worth," and the fact that different persons will ascribe different degrees of "worth" to the same set of facts, that generally leads us to conclude that this moral attribute, whatever physical basis it may have, is not a physical attribute of the same kind as is hardness or color. The hardness of steel appears to reflect a physical quality of an external object, although I recognize that quality with my mind. The moral worth of an act of thievery appears to reflect an attitude of my mind, although I need an external event in order to give that attitude any concrete meaning. Hardness appears to be established independently from human minds, while moral worth appears to

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67 After reciting the is/ought distinction, Hume in his next sentence concludes that humans had to have a common sentiment or moral sense: "Thus the course of the argument leads us to conclude, that since vice and virtue are not discoverable merely by reason, or the comparison of ideas, it must be by means of some impression or sentiment they occasion, that we are able to mark the difference betwixt them." HUME, *supra* note 4, at 471. See TOULMIN, *supra* note 25, at 20-21 (discussion of this point).

68 We can train infants who have not yet developed their capacity for free willed decisions, but in that case the influence of conformity was on the parents.

be a mental variable dependent on the status of a particular mind. We generally conclude from this that moral worth is a subjective attribute of the human mind somehow generated by the human will. Yet both the hardness situation and the thievery situation connect humans in some fashion to the physical world. It may be that there are four or more variables involved: the physical hardness of the steel, and the hardness I perceive; and the physical or objective value of an act of stealing and the value I perceive. A physically determined relationship between these variables may exist and needs to be explored.

Somewhere between our descriptive rules and our normative rules are other rules which are not so easily classified as either. At the subatomic level the ordinary Newtonian laws of physics do not apply. Outcomes cannot be said to have a predetermined cause and effect relationship where individual subatomic events occur within a relevant space. This is not because we are unable to observe the events or because the act of observation interferes with the events in progress.<sup>69</sup> Instead there is an indeterminacy to the individual events themselves which is intrinsic to the nature of subatomic particles and to energy. Yet this indeterminacy does not prohibit us from statistically predicting the outcomes of large numbers of such events. We cannot predict where a particular photon of light will hit a screen, but we can predict what the pattern is going to look like. We make these predictions in accordance with the rules of quantum mechanics.<sup>70</sup> The foundation for these predictions are probability distributions. Probability distributions are one way of describing the existing status of physical reality.<sup>71</sup> They also allow us to connect conditions as they are to conditions as they will be.

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69 See HERBERT, *supra* note 15; BAGGOTT, *supra* note 15. See generally WERNER HEISENBERG, *PHYSICS & PHILOSOPHY* (1958).

70 See PEAT, *supra* note 15, at 55 (discussing wave functions and probability distributions), FEYNMAN, *supra* note 4, at 6-1 to 6-10.

71 As an example, we ordinarily say that electrons orbit their nuclei. This is loose talk. All we can say, in reality, is that the location of an electron within an atom is described by its probability distribution. This does not mean that a material electron is located *somewhere* but we don't know where. It means something closer to the statement that it is located everywhere or nowhere. One way to help visualize this is to say that the electron is "smeared" around the nucleus as described by its probability distribution. We can within empirically determined margins of error physically describe the behavior of electrons by the statistical probabilities related to the physical processes involved, although the behavior of a particular electron remains uncertain. See HERBERT, *supra* note 15, at 122-29.

Without the predictability of the macroscopic or collective effects of the underlying physical forces involved, we could not, as in *Thought Experiment #1*, fuel our nuclear submarine, keep it submerged, pilot it through the narrows, or rely on our sonar equipment to tell us the shape and size of surroundings we cannot otherwise see by the human eye. We rely for each of these on probabilities. How you decided the question in *Thought Experiment #1* most likely depended on how you assessed the various probabilities involved.

Perhaps related to this are our formulations of rules which describe some of the behavior patterns of life forms. On the one hand, while the individual behavior of a single-celled protozoan among the hundreds of thousands of such protozoans in a droplet of water containing a limited food supply is unpredictable and perhaps indeterminate, various aspects of the behavior of the entire group are statistically predictable and governed by the collective results of the forces which emanate from their own biochemistry.<sup>72</sup> Notions of free will seems inapplicable. The forces which control the observed behavior are at least partially described in the genetics. As a result, the behavior of protozoans relates more readily to descriptive rules than to normative rules.

On the other hand, the descriptive rules of a wolf pack hunting and feeding on caribou take on normative aspects. The pack appears to follow rules about which animals lead the chase or ought to lead the chase and which animals feed first or ought to feed first. Some wolf behavioral instructions appear wired in by genetic processes, as with protozoans, and some instructions appear to be mapped in through training and reinforced through acts of retribution or power.<sup>73</sup> We observe as a general rule that physical recognition of particular patterns of behavior or other stimuli often produce predetermined responses. Yet some, if not all, of these responses can be overridden by training. The process of training takes on some of the characteristics of influencing decisions to achieve conformity to social norms. I will refer to such physically amendable rules as *quasi-normative rules*.

These quasi-normative wolf pack rules appear to be incorporated directly into the physiology of the animal. By that I mean

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72 We may be able to analogize this to actuarial tables, for example.

73 See WOLF AND MAN, EVOLUTION IN PARALLEL, *supra* note 10, at 81-106; L. DAVID MECH, THE WOLF: THE ECOLOGY AND BEHAVIOR OF AN ENDANGERED SPECIES 68-110. See generally THE BEHAVIOR AND ECOLOGY OF WOLVES (Erich Klinghammer ed., 1979).

that they appear to operate automatically.<sup>74</sup> Sometimes, however, there are time delays, as if the wolf was trying to decide what it wanted to do next. Our full notion of free will seems inapplicable, but some aspects of a wolf's behavior seem to be related to our notion of free will. Recognition that a second wolf is feeding out of turn usually but not always triggers retribution. Hunger ordinarily triggers not just a hunt, but a collaborative hunt. This collaborative effort takes place in accordance with a generally predetermined pattern, but the pattern and outcome of a particular hunt seem to vary based on "decisions" made by various wolves during the hunt. Signs of volitional behavior exist, but the wolf's volitional capabilities and actual decisionmaking abilities, if any, do not match that of a human's. The wolf's quasi-normative rules function like normative rules yet are descriptive of the internal and external forces which control the wolf's behavior, and therefore the wolf's future.

Some distinctions and similarities between wolves and prehistoric humans, and between prehistoric and modern humans, are brought out by *Thought Experiment #2*. How you resolved the question most likely depended on the degree of volitional and decisionmaking capabilities you ascribed to the prehistoric human. The more wolf-like and hungry you imagined you were, the more likely you went for the meat, hoping to beat a fast retreat. The greater the decisionmaking capabilities you granted yourself, the longer you would have spent weighing the alternatives and the odds. If you imagined yourself having more modern human decisionmaking capabilities, you would probably have discounted your past clan experiences as to their treatment of thieves and outsiders, as this might have little bearing on the unknown ways of the aliens. A prehistoric human would probably lack this degree of perception, and might have accepted his or her own clan's way, through training or a sense of obligation, as a conscious or unconscious guide for behavior.<sup>75</sup> If so, she or he might well have walked, perhaps with temerity, into the camp and voluntarily submitted, hoping to eventually be assimilated—unless, of course, you viewed yourself as a strong male. If so, the fear of death might have driven you away.

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<sup>74</sup> See generally PRIBRAM, *supra* note 2.

<sup>75</sup> See generally LUMSDEN & WILSON, *supra* note 62; HUNTERS AND GATHERERS, *supra* note 62; PFEIFFER, *supra* note 4.

In any case, it is unlikely that our prehistoric human would have seen the problem as one involving moral worth. This is not to say that prehistoric humans did not have spiritual taboos and early forms of religious convictions. Spiritual and religious experiences and expressions are a likely source of normative rules in pre-modern cultures. Another likely source would be the expressions and actions of secular leaders.<sup>76</sup> The sense of obligation to follow rules, which is in itself a rule, may have developed as a result of spiritual or religious training. On the other hand, the sense of obligation to follow rules and the desire to conform may have their roots in quasi-normative rules, as a result of trained or instinctual responses. Although prehistoric or pre-modern humans may not have distinguished issues on the basis of a developed sense of moral worth, they are likely to have distinguished between the sources of power behind spiritual and secular rules. The question remains whether there are any physical explanations underlying the development of *pre-modern normative* rules.

It is my contention that any modern, coherent theory of morality which purports to be objectively based must at least account for the apparent existence of quasi-normative rules, such as the wolf pack rules, and the potential transformation of such rules into pre-modern normative ones, such as primitive tribal rules. What are the sources of quasi- and pre-modern normative rules, and what function, if any, do they serve? What relationship exists between such rules and modern rules of human conduct?

#### D. *Three Connotations of Ought*

I introduced, in Part II.C., three connotations of the word "ought." The first related to probabilities, the second related to making decisions, and the third related to notions of moral value. Here I explore the relationship between these connotations and their relationship to physical survival.

The first connotation is implied in the statement, "the sun ought to rise tomorrow." Why can we assert that? We can assert it because there is a high physical probability that the sun will rise tomorrow.<sup>77</sup> Why do we say that there is a high probability that

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<sup>76</sup> See generally EMILE DURKHEIM, *THE ELEMENTARY FORMS OF RELIGIOUS LIFE* (Joseph W. Swain trans., 1915); ELVIN HATCH, *THEORIES OF MAN AND CULTURE* (1973); ADOLF E. JENSEN, *MYTH AND CULT AMONG PRIMITIVE PEOPLES* (Marianna T. Choldin & Wolfgang Weissleder trans., 1963) (1951); HUNTERS AND GATHERERS, *supra* note 62; PFEIFFER, *supra* note 4; WILSON, *supra* note 4.

<sup>77</sup> This is subject to our general assumption of continuity in physical rules. See *supra*

the sun will rise tomorrow? We say it because we believe we know things about the history of the sun and the rotation of the Earth, and from these "facts" we infer things about the future. The ought statement, in other words, has been truncated. It needs a *because* clause. Without a because clause, the ought statement does not reveal its grounds. By expanding the statement, we get:

*Sentence 1*      The sun ought to rise tomorrow, *because* we know A, B and C about the consequences of planetary motions in relation to the sun, and it follows that the sun will probably rise tomorrow.

The basis for our assertion is now revealed. We can proceed to debate the probabilities involved relative to the physical consequences of planetary motions in relation to the sun.

The other two connotations of "ought" ordinarily involve humans. The two connotations are implied, but not necessarily present, in a statement like "Gret ought not steal." We could mean that Gret ought to make a decision not to steal for reasons unrelated to moral worth, or we could be implying that there is a moral value associated with stealing regardless of any decision which is made about it. We don't know which connotation applies, because the statement is truncated. It is missing its *because* clause. The grounds for our assertion are nowhere to be seen.

Observe what happens to the connotations if we complete the second ought statement as follows:

*Sentence 2*      Gret ought not steal, because we know X, Y and Z about the consequences of human tribes which tolerate stealing, and it follows that Gret will probably not steal.

What I no longer see in this version is the moral value connotation. It's been driven out of my mind by the connotations of the word "probably" in relation to the word "consequences." My notion of moral value does not readily associate with the idea of probable consequences. My notion of moral value associates more readily with the idea of intrinsic worth or with rules which apply regardless of consequences. Although the moral connotation seems

to be gone, I notice that a confusion has entered into the sentence between the first two connotations of "ought."

Why will Gret probably not steal? Is it because it is not likely to occur to someone in Gret's situation to steal? Or is it because Gret is not likely to decide to steal?

If it is the first situation, then Gret's behavior is being described by a quasi-normative rule (wolf pack rules). If it is the second situation, then the implication is that Gret has the ability to decide to steal but is not likely to do so for some reason. Before proceeding to the second situation, I want to explore the implications of the first one.

Free will is not needed for organisms to function. The squirrel buries acorns for the winter, the beaver builds a dam, and wolves hunt caribou without free will and without any obvious foresight of impending physical events. There is no planning. There is only doing. In the process of doing, rules develop.

The actions which non-free willed organisms take are described by rules written into the physiology of the brains of those organisms.<sup>78</sup> What these rules appear to be are pattern recognition-pattern response cycles. Incoming patterns from the physical world trigger response patterns in the brain which energize an action. No one wrote these rules.

Rules of the brain, for non-free willed organisms, appear to have developed and survived as a consequence of two objective processes. First, response patterns appear to develop within the brain according to the rules which describe or regulate the biochemistry of the organism. This may be random trial and error, or there may be some specific direction to the process, or both. By both I mean that there is some specific probability distribution to the biochemical events which produce new response patterns. Not all organisms develop the same rules. This accounts for the diversity we see in life forms. Diversity appears to be an objective end of the biochemical processes of organisms which enhances the prospects that some form of life survives.<sup>79</sup>

Second, rules of the brain appear to survive as a consequence of an *objective test*: response patterns that support or at least do not detract from continued survival continue to exist. A corollary to

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78 See Figures 2 & 3 *supra* text accompanying note 16.

79 Diversity in ideas may also be an advantage in a culture. See generally DULBECCO, *supra* note 15, at 99-126 (diversity is the manner in which new genetic combinations are developed and tested).

this test seems to be: those response patterns which enhance the odds of survival will gradually be favored over time.<sup>80</sup>

The physical rules of survival and the physical law of probabilities would appear to be sufficient to account for this test. Survival is a function not only of reconstitution but also of propagation. Organisms which do not develop rules sufficient to overcome the desires and skills of other organisms with which they interact are likely to disappear through diminishing rates of propagation. Survival is therefore a function, in part, of the desires, behavior patterns and rules of other organisms. The behavior patterns of organisms are interconnected.

Some of the rules written into the brain we call instincts. Other rules I have called trained responses. Instincts seem to be response patterns linked very tightly to incoming physical patterns. They are linked so tightly that they seem to operate automatically, almost instantaneously. Some of these instincts are powerful influences on the "will" of an animal: They seem to serve functions related directly to survival (fight or flight responses, mating rituals, primping, territorial protection, territorial expansion, resource accumulation, aggression, possessiveness). They can also from time to time get the animal into trouble and lead to death. Instincts tend to paint with a broad stroke, and if they are in error they can place survival in jeopardy.

Perhaps instincts are brain functions which can't be directly amended. Trained responses, on the other hand, seem to be amendable. They involve learning. They can be overwritten with new responses. Animals can be taught tricks and trained into routines. Left alone, they learn their own tricks and develop their own routines. Using computer language, instincts appear to be hard wired, while trained responses appear to work like software programs recorded on a mass storage device. The circuits for all this are the vast networks of neural synapses contained in the brain.<sup>81</sup>

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80 Charles Darwin defined natural selection as "[t]he preservation of favorable variations and the rejection of injurious variations . . . ." MAYR, *supra* note 15, at 95, *quoting* CHARLES DARWIN, *ORIGIN OF THE SPECIES* (Harvard University Press 1964) (1859). The objective test as I've drafted it is intended to be a more general statement related to the adoption and success or continuation of rules of survival. It is intended, as a general notion, to take into account other theories of species evolution, including adaption theories. See MAYR, *supra* note 15, at 127-264.

81 See *supra* note 58 and accompanying text. See also PRIBRAM, *supra* note 2.

Trained responses appear to be able to override instinctual responses, at least some of the time. Speculating, it seems that animals can set up response cycles designed to compete with instinctual responses or catch internal desires as if they were external patterns and override the responses which would otherwise have made it back to the external world.

Not stealing may be such a trained response. The instinct that supports survival is for the animal to take what it needs to survive. If the animal did not have that instinct, it would soon starve to death. But if what the animal needs is in the possession of another animal, responding directly to instinct may jeopardize survival. If both animals are needed to hunt caribou (team efforts enhancing the odds of survival), then a rule against stealing coupled with rule under which everyone eats may gradually be favored over time. Such social rules, in the form of trained responses, enhance the odds of survival for the participants in the social system.

There does not need to be any subjective will or subjective purpose involved. Issues of moral worth do not need to be brought in. What is needed is a mechanism by which brains develop, test and retain successful survival techniques. The development of the ability to institute trained overrides appears to be an objective end or consequence of the gradual development of human brain functions. Perhaps both the lower and the higher brain functions of humans developed in response to the physical forces of survival, the lower functioning according to some older rules and the higher functioning according to some newer rules. Both instincts and trained responses involve the use of power and energy. Both processes appear to be expressions of how energy reacts to energy.<sup>82</sup>

In such a case, I contend that there is no fundamental distinction between the sun rising, Sentence 1, and not stealing, Sentence 2, although the probabilities which describe the physical processes change.<sup>83</sup> The rule against stealing, like the rule that

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82 See generally ERWIN SCHRODINGER, *WHAT IS LIFE? & MIND AND MATTER* (1967) (discussing possible physical explanations for life). See also WICKEN, *supra* note 46, at 53-94 (describing the potential effects of thermodynamic forces on evolutionary developments); BROOKS & WILEY, *supra* note 46, at 24-75 (describing relationship between biological and thermodynamic evolution); ENTROPY, INFORMATION, AND EVOLUTION, *supra* note 46.

83 There are two answers to any objection based on the distinction that one process is animate while the other is inanimate.

the sun ought to rise, is a product of all the physical forces which interacted to produce the particular rule. Absent free will, "Gret ought not steal" is an expression which can be derived directly from the rules of physical conduct, expressed as a physical rule of survival which enhances social cooperation.<sup>84</sup> Absent free will, Gret is operating under a quasi-normative rule. No elements of free will need be involved. If so, quasi-normative rules are descriptive rules. Under such circumstances there is an is/ought relationship, not an is/ought distinction. The is/ought distinction is invalid to the extent of the relationship.

If we now add the ability to make free willed decisions, then Sentence 2 takes on the second connotation of the word "ought" (making decisions). Incorporating this connotation into Sentence 2, I get:

*Sentence 2a* Gret ought to make a *decision* not to steal, *because* of practical reasons A, B and C which are unrelated to moral worth; Gret has the ability to make free willed decisions; it follows that Gret will probably decide not to steal.

The situation in Sentence 2a exists because we have added the element of free will. The conclusion, however, does not follow. The conclusion cannot follow because practical reasons don't make decisions, Gret does. Gret does so as a function of free will. We must hope that the practical reasons A, B and C are incorpo-

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First, the forces which form and reform atoms and molecules in the Earth's atmosphere are the *same forces* which form and reform atoms and molecules in a living system, even though the ostensible effects are quite different. It is not surprising that ought statements related to living organisms look different than ought statements related to the weather. The ought statements related to the weather look different from those related to volcanos. And the ought statements related to macroscopic behavior of social animals look different from those related to cardiovascular systems.

Second, the fact that the probabilities vary does not mean there is a difference in the underlying nature of those probabilities. If I say that under prevailing conditions it will to rain, my inference may be valid, but what are my odds of a successful prediction? So instead I say, as a general rule, under these conditions it ought to rain. But that's exactly the same as saying, as a general rule, under these conditions, Gret ought not steal. *Give me more facts* and I'll improve the specific formulation of both ought statements.

84 The fact that not every species develops the same set of survival rules does not mean the process is not physical. It means we don't know enough about how brains and rules develop. See Figure 6 *supra* Part II.B.

rated into Gret's thinking and influence Gret to decide not to steal. A correct description of the situation appears to be:

*Sentence 2b* Gret ought to make a *decision* not to steal, *because* of practical reasons A, B and C which are unrelated to moral worth; Gret has the ability to make free willed decisions; if Gret is *persuaded* by practical reasons A, B, C, or any other considerations, then Gret may decide not to steal.

A descriptive or quasi-normative rule has been transformed into the first version of a normative rule (influencing conformity of conduct through decisionmaking) by the process of adding free will. We now verbalize a rule we previously operated under through instinct and training. Free will, however, has freed Gret from having to follow the physical rules encoded in Gret's brain. I observe that the rules themselves have not changed.

Freeing Gret has advantages relative to survival. Not every rule encoded in Gret's brain enhances survival. Other rules may have become obsolete as conditions changed. Or perhaps a rule generally enhances survival, but will not do so in a given situation. Or perhaps a rule enhances survival, but a revised rule will further improve the odds. Gret can choose whether to affirm the physical rules Gret perceives, attempt to improve on those rules, or not follow them at all. This process is rational. An organism that acts rationally in light of objectives would appear to have advantages over an organism which is restricted to acting on instincts and trained responses.

Freeing Gret may also have disadvantages relative to survival. Gret can change or adopt rules based on considerations unrelated to survival, or endorse physical urges which may support survival in some circumstances but which do not do so in the given situation. Or the reasoning employed in ostensibly pursuing survival objectives may be faulty. Unchecked aggression, whether in a barroom or between nations, is potentially an example. Such decisions may lead to a failure to survive.

The word "ought" in Sentence 2b now connotes a need to make a decision or to influence a decision, because Gret is now free to make any decision Gret wants to make about rules. The *because* clause calls either for practical reasons which support a rule in light of an objective (in the event Gret decides to make rational decisions) or for other considerations which will influence

Gret (in the event Gret makes decisions based on such influences). Before free will, the *because* clause called for the factual basis to sustain the probability assessments that Gret would follow a particular rule.

One consequence of the development of free will is that I can no longer analyze the physical probabilities related to an individual organism in the same way. I must now know facts about how Gret personally makes decisions if I am to make any viable inferences about how Gret will act. The physical situation is described by the following:

*Sentence 2c*     Gret has the ability to make decisions, and because we know D, E and F *about Gret*, it follows that Gret will probably decide not to steal.

This situation looks similar in form to the situations in Sentences 1 and 2. But is it? Can I make viable inferences about Gret's decisions if I know enough *facts* about Gret's free willed decisionmaking processes? Absent free will, facts D, E and F about Gret were not needed. Instead, general facts X, Y and Z about the physical processes involved in developing instincts and trained responses were needed, as in Sentence 2. Such facts reflect conditions in the physical world, given the objective of survival. Such facts allow me to make predictions about the behavior of organisms that follow quasi-normative rules.

Free will, by definition, is not constrained by objective forces. If it is not constrained by objective forces, then free willed decisions might be indeterminate. If free willed decisions are indeterminate, then a discontinuity has appeared in the system. There may not be any physical probability distributions associated with the process of free will upon which to base viable inferences about human decisions, whether related to survival or any other objective. Accordingly, the is/ought distinction *may* apply to inferences about how *Gret* will make a free willed decision. Under the assumption of free will, I cannot rely on the probability assessment implied in Sentence 2c.

This is a problem. If my survival depends in part on the decisions and actions of others, it would be helpful to know what influences their decisions. Does free will have a need to survive? Are there factors which routinely influence a free willed decision?

In this regard, I observe that Sentence 2c is not useless. The sentence still applies, for example, to the situation where an actor

has the ability to decide, but free will is either not in operation or does not interfere with routine "physical decisions." Free will may be suspended or overpowered by the force of passions, emotions, instincts or trained responses, by the introduction of chemicals, and perhaps by volition. Even when not overpowered by instinctual responses, humans often act voluntarily in accordance with their instincts and training. Character traits develop which include routine patterns for responding to situations, including situations which call for decisionmaking. These routine patterns may become reinforced by habit.

One of our traits or habits is to follow the advice of authority. Following the advice of authority can become a trained response. If we know someone follows a particular authority, we may be able to anticipate their decisions. Another one of our traits or habits is to think things through rationally in accordance with our objectives and values. Humans act rationally in accordance with objectives because humans are rational. If we know what someone's objectives are, and have some sense of their values, we may be able to anticipate their decisions by thinking through the logical consequences of such objectives and values. Humans also act emotionally. Humans act emotionally because they are emotional. If we know someone is likely to act emotionally, we will take that into account. Humans can be classified according to their behavioral patterns even though these patterns may be changed through acts of free will.

In these various cases, facts about a person's traits or mental routines become physical variables which can be used to make educated guesses, if not viable inferences, about the outcome of that person's decisionmaking process.<sup>85</sup> We guess at what other people will decide to do and then act on those guesses. We act as if there is a valid distinction within humans between a physically driven decision, as with wolf packs and other social animals, and a free willed decision. If there is, then Sentence 2c has utility. If so, then an is/ought relationship still exists relative to some decisions, despite the existence of free will. The factual basis for this relationship is the set of physical factors which describe a particular person's character traits.

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85 An educated guess does not rise to the level of viable inference unless there is a determinable probability distribution associated with the event.

Regardless of how a given person acts, an is/ought relationship still exists relative to the physical factors which support survival. I cannot create just any set of rules and survive. The factual basis for these ought statements may vary with the physical conditions which confront me, but the physical rules of survival attach to these conditions, not to my mind. Some derivation of these rules becomes incorporated into my mind through instinct, training, rational thought or otherwise. These derivations are expressions of the physical rules of survival, like "red" is an expression of the wavelengths of light which strike my eye. Some of our derivations may be in error. The advantage of rational thought is that it can distinguish between derivations and can identify the physical variables which determine the rules. Through thought experiments and physical tests, rational analysis can, in theory, improve on the accuracy of the ought statements we derive from the physical conditions which determine survival.

The fact that free will is one of the variables, and perhaps an indeterminate one, does not alter my conclusion, it alters my strategy. The indeterminacy of free will becomes a physical fact which must be taken into account in deriving the rules of survival. I must take into account the potential for indiscriminate behavior and make efforts to influence decisions in favor of survival. As long as humans physically interact with each other and the surrounding environment, there will be physical rules which determine whether those interactions support or disparage survival.

The strategy in the previous paragraph has a defensive cast. It may be that free will, whether physical or non-physical is something which enhances the prospects of human survival. Speculating, it is possible that free will developed gradually and physically. The development of free will may have depended on the prior or concurrent development of other processes of the brain, such as rationality, consciousness, moral evaluation and early forms of religious expression. These processes may all be physical. Consciousness would have made humans aware of themselves as individuals, separate from the pack, and rationality would have provided the tool for achieving self-conscious objectives. Rationality may have emerged from the process of intentionally experimenting with and revising trained responses. Using their rational skills, humans would have gradually learned how to distinguish alternative actions based on the likely consequences of those actions.<sup>86</sup>

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86 See *supra* text accompanying note 17.

Some process in the brain would have had to develop to make selections between alternatives. Selection points to criteria for selection and to objectives. Through the proactive phase of the linear cycle, humans would have learned not only that they could choose between alternative actions in light of an objective, but that they could change objectives as well. Early forms of moral evaluation and religious expressions, cast perhaps in the form of obligations to follow uniform rules, might have developed as a balance to self-conscious objectives based on individual wants and desires. Free will may have emerged as that part of the higher level brain functions which somehow weighed and selected alternative actions and objectives. On balance, free willed decisionmaking may enhance the prospects of human survival. The weighing process may have a physical basis, tied to wants, for example, or it may be indeterminate. To resolve that question, we need more facts about how humans make free willed decisions.

Although Sentence 2b remains intact, until we have more facts about free will, Sentence 2c reduces to:

*Sentence 2d* Gret has the ability to make *free willed* decisions, and because we know G, H, and I about the physical world, it follows that Gret will probably make *some kind* of decision relative to stealing.

I can make this inference based on what I know about time and events. Time and events happen to all. Gret will be faced with the physical consequences of physical events. Physical reality confronts Gret with the opportunity to make decisions. No decision has the force of a decision, since not making a decision will produce physical consequences of its own.

The *objective test* for the decisions humans make remains essentially the same: Decisions and responses that support or at least do not detract from continued survival continue to exist. The corollary test, that decisions and responses which enhance the odds of survival will gradually be favored over time, may have changed. As a physical rule of survival, the corollary test remains the same, but it may apply to humans only in the negative: Decisions and responses which disparage the odds of survival will be disfavored over time. The application of the positive version of the rule may depend on whether free willed humans learn from their history. This assumes that no decision is made that eliminates the entire species first.

The third connotation of the word "ought" involves the notion of moral value. If I add an evaluative connotation to the word "ought," the original sentence, "Gret ought not steal," expands to:

*Sentence 3*      Gret ought not steal, because it is *wrong* to steal.

The word "wrong" points to some kind of evaluative criteria related to stealing or to people who steal. If Gret asks me why it is wrong to steal, then I might say one of several things in response: (i) It is wrong because of practical reasons A, B, and C, in which case I am addressing the question under Sentence 2b as a rational issue related to consequences, with the understanding that Gret may be influenced by other considerations. (ii) It is wrong because not stealing refers to something called a moral fact.<sup>87</sup> I will support this statement with theories about moral facts. (iii) It is wrong because it is wrong in the view of my social group or my community. I will explain the basis for the particular view. (iv) It is wrong because it is wrong in the view of my religious group. I will likewise explain the basis for the particular view. (v) It is wrong because it is morally wrong to me. I will then explain my personal moral views.

In this essay, I am interested in explanations (i), (iii) and (v). Explanation (i) has already been discussed, but will come back in later. Explanations (ii) and (iv), and other explanations, may accurately describe reality or an aspect of reality, but the specific bases for their explanations are outside of the scope of this essay. The relationship of moral statements to moral facts or to religion will be discussed in general terms only.

In looking at the grounds for finding something morally wrong under explanation (iii) related to social groups or the surrounding community and under explanation (v) related to individual moral views, I suggest that Sentence 3 has the following common meaning:

*Sentence 3a*      Gret ought not steal, because stealing has associated with it a negative *moral value* or *moral worth*.

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<sup>87</sup> See generally Moore, *supra* note 2; Michael S. Moore, *Law as a Functional Kind*, in NATURAL LAW THEORY 188 (Robert P. George ed., 1992); BRINK, *supra* note 2. Contrast Jeremy Waldron, *The Irrelevance of Moral Objectivity*, in NATURAL LAW THEORY 158 (Robert P. George ed., 1992).

I observe that the sentence involves no decision by Gret and has no conclusion about whether Gret will or will not steal. If it did, then the moral value at stake becomes either a practical reason or one of the other considerations why Gret's decision ought to be influenced, and the situation reverts to Sentence 2b. Moral values become something which guide or influence Gret's decisions.

Sentence 3a, however, can stand alone as a statement about the type of value that is *in* something or connected to it, independent from what particular actors choose to do about it. Volition of an actor does not have to enter into the picture, unless the volition of the one who makes the evaluation determines what the value is. This raises the question of what we mean by "value" and by "moral value." Descriptive or quasi-normative rules were transformed into the first version of modern normative rules by the addition of free will. The transformation changed the connotation of ought from physical outcomes to free willed decisions about outcomes. The rule remained the same, but the transformation now requires that Gret be freely persuaded about physical outcomes. The use of the ought statement changed, and the factors which plug into the *because* clause changed. Sentence 3a appears to be another transformation, but of what sort?

The answer rests on what "value" and "moral value" are and where they are located. By disassociating the word "value" from the word "moral," I see that it's possible that the location of value and the location of moral value may be different, even if the concepts are related to each other. Earlier I identified one of our common conclusions: that moral worth is a subjective attribute of the human mind somehow generated by the human will.<sup>88</sup> If that conclusion is correct, then moral value is a subjective thing located in the human mind. But is moral value, like hardness or the color of red a reflection of some external *thing*? If "value," absent the word "moral," can be said to be found *in* the relationship between objects, and therefore an expression of physical circumstances and physical forces, then "moral value" might be a reflection of that value and those circumstances and forces, like "red" is a reflection of the wavelengths of light emitted from a physical object, and "hardness" is a reflection of density and rigidity.

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88 See *supra* text following note 68.

This is the four variable system I referred to earlier.<sup>89</sup> Actual red is to perceived red, as actual value is to perceived value. Intuitively the analogy does not seem to hold up if by "perceived value" we mean "moral value." We seem to generally concur as to what red means, but we do not generally concur as to what has moral value. Moral evaluation seems to be a process generated or engaged in by a subjective will relative to a set of criteria for correctness which can be independent of external objects, rather than a perception of a physical attribute. But if *some* moral evaluation is a reflection of physical reality, then there has to be some *thing* to evaluate.<sup>90</sup>

If some moral values are transformations of physical oughts, then the following six variable system emerges:

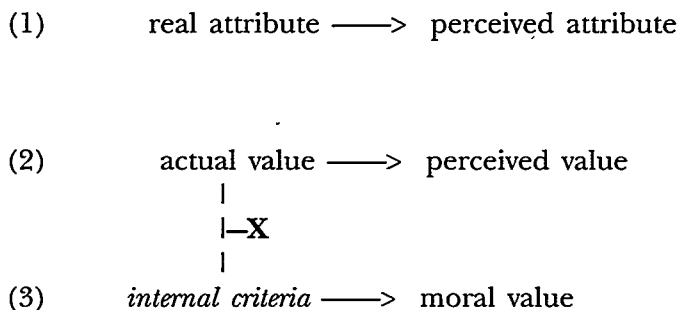


Figure 7

This expression is similar to the three relationships described in Figure 6, except listed in the reverse order.<sup>91</sup> The notion represented by Figures 6 and 7 is that there is an actual value to physical things which can be perceived, and that the perception of this actual value can be transformed by the subroutines of X into a moral value based on some criteria which explains the transformation. If the criteria are physically determined, then the transformation would be predictable. If the criteria are not physically determined, then the transformation may be indeterminate.

89 See *supra* text following note 68.

90 See generally Moore, *supra* note 2; BRINK, *supra* note 2.

91 See Figure 6 *supra* Part II.B.

If there are actual values in things which can be perceived without being processed by the brain through subjective criteria, then a new situation exists:

*Sentence 3b*      Not stealing ought to be a value in physical system A, because the system does X, and not stealing does Y to support X.

This statement about values is free of moral connotations and moral actors. It relates values to consequences and to objectives.<sup>92</sup> It relates logically to Sentence 1, the sun ought to rise, not to Sentence 3a, it is morally wrong to steal.

Perceiving what the values are, like perceiving how the sun works, is a rational process. But in comparing Sentence 3b to Sentence 1, the word "value" sounds peculiar. We do not usually associate value with physical forces, like gravity. Setting aside that concern for the moment, I can see that Sentence 3b, which sounds objective, can be transformed into Sentence 3a, which sounds subjective, by the operation of a subjective will which can freely evaluate things, as in Figure 7. By definition, a free willed subject can switch the word "negative" in Sentence 3a to the word "positive" by a simple act of will, in which case the "ought not" switches to an "ought." Theoretically, there does not have to be any grounds or criteria for the switch. But to help anchor the discussion, I will say that such a switch is grounded in the free willed subject's own best lights or its internal criteria, whatever they may be. These can include unusual community or group values and out of the ordinary religious convictions.<sup>93</sup>

Making the switch may not be illogical as far as the particular free willed subject is concerned. I'm a free willed subject. Assume *arguendo* that not stealing supports survival. Assume that I'm trying not to survive. Under these circumstances, stealing logically becomes a positive rather than negative value in my system. Although the converse of a valid logical statement is not always valid, it appears that if I steal in the right places, my odds of survival will go way down.<sup>94</sup>

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92 See Joseph Raz's arguments against forms of consequentialism. JOSEPH RAZ, *THE MORALITY OF FREEDOM* 267-87 (1986).

93 Compare this process to the Branch Davidians or the Jonestown deaths.

94 Compare what happened to the Branch Davidians as a function of what a neighboring group is likely to do in response.

If my objective to not survive is physical and not a function of free will, then I'm functioning under Sentence 3b. The physical objective, X, is to not survive. Stealing should be a positive value in the system, because stealing supports X. In such a case, there is an is/ought relationship as to all aspects of the system, including the likelihood that the system will not survive. If someone analyzes me and determines that free will is not involved (or has been overpowered), then they will look for physical reasons why I do not follow the general rule of life forms, which is to survive. They might look for a drug habit, physical depression, or some other explanation why I do not physically fit the general rule.

If I switch objectives as an act of free will, then I'm functioning under Sentence 3a. Stealing has become a positive moral value in my system of morality. Not surviving has become a conscious objective. Here the is/ought distinction may apply to the decision to switch objectives, but not to the subordinate values which support this new objective, at least not to the extent that they are logically derived from physical consequences, given the new objective. If someone analyzes me and determines that my decision to not survive is based on a free willed choice, then they will look for the non-physical criteria by which I made this choice. They might declare that I have placed myself in an irrational state by deciding not to survive. This claim is valid, however, only if it is rational to survive.

If freely selected criteria are used to establish positive or negative *moral* values relative to stealing, then a descriptive rule, Sentence 3b, or a quasi-normative rule, Sentence 2, has been transformed into the second version of a moral evaluation normative rule, Sentence 3a, by the process of adding free will to a system which is otherwise described by physical ought statements. It is not necessary for the fundamental objective of survival to change for this transformation process to operate. I can freely affirm the objective of survival and then freely evaluate any of the other physical oughts in the system. I do not have to be consistent. I can come to any conclusion or mix of conclusions I wish. It appears that I can arrive at moral value statements in at least three ways (Figure 7): (i) I can perceive the actual value of a physical ought relative to survival and then assign a *moral* value to it, (ii) I can idealize the physical ought statement without perceiving its actual value relative to survival, and simply declare that that ought statement represents a moral value in my system, or (iii) I can

add new ought statements that are not dependent on physical oughts.

I suggest that some combination of (i) and (ii) may explain the initial transformation of quasi-normative and pre-modern normative rules into early forms of modern systems of morality.<sup>95</sup> The process of idealizing a physical ought statement (by truncating the physical grounds) has the advantage of encouraging or reinforcing behavior which supports survival without the individual needing to know why that behavior supports survival. It has the disadvantage of rigidifying the system into a set of specific rules the enforcement of which may become an end in itself. If this occurs, the adherent to the moral system may never see the physical objective to which the rule or the system is directed.

Perceiving actual values has the advantages of correcting errors generated by idealizing physical ought statements. As was the case with rational analysis of rules, not all physical ought statements support survival. Intuitively perceiving actual values and assigning a corresponding moral value to the actual value would encourage behavior that enhances the prospects of survival in accordance with the actual value of that behavior. Under such circumstances, moral values serve as a substitute for the practical reasons in Sentence 2b.

Humans, however, can adjust moral values for subjective purposes, whether intentionally or unintentionally. Adjustments might have entered in through early forms of moral, religious and secular training in service to the desires, wants and needs of leaders.<sup>96</sup> Perceptions and experiences would have varied. Cultural practices would have developed and diverged. Some of this divergence might have been random. As adherents followed the adjustments made by their leaders, and made adjustments of their own, behavior patterns would have continued to change. Some of these adjustments would have supported survival, while others would have disparaged it.

I further suggest that some combination of (i), (ii) and (iii) may explain the subsequent development of modern systems of morality. At some point in history, humans discovered that objectives and values could be freely changed. Once this point was reached, philosophies and morality systems could develop which

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95 See generally PRIBRAM, *supra* note 2.

96 See *supra* note 76 and accompanying text.

were not connected to rational analysis of physical events.<sup>97</sup> The tools for in-depth historical or scientific analysis of physical events did not develop until much later in history. Ideas which develop may be physical and may carry a force of their own. On the other hand, the process may be indeterminate. Either way, the human brain reached a point where it could disassociate ought statements from any physical grounds.

### *E. Defining Objective and Subjective Morality*<sup>98</sup>

In this section, I define objective and subjective morality.

A specific effect of the subroutines of X surfaces in the variability of our value structures and our objectives. At the beginning of a decision, whether related to an external event or involving only internal contemplation, we have memory traces of the last ordering of our values and objectives. During the decision we can change our values and objectives, by adding to or overwriting the old ones. In theory, we can do this without any physical or rational grounds. We may be influenced to make changes for any number of reasons. Both external and internal events will influence our decisions. These influences may include such things as rational thought, moral evaluation, moral discourse, artistic expressions, religious feelings and experiences, instincts, trained responses, and the physical pressure of internal desires, wants and needs. We can hold multiple sets of objectives, rules and values in our mind which may be consistent or inconsistent with each other, and consistent or inconsistent with the physical rules of survival.

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97 I do not intend to imply that this means those philosophies and moralities are in error, only that they do not depend on rational analysis of physical events.

98 Various decisionmaking models and analytical tools have been discussed or proposed relative to legal decisions. It is useful to list some of them here for comparative purposes. See generally RONALD DWORKIN, *TAKING RIGHTS SERIOUSLY* (1978); POSNER, *supra* note 25; Bruce Ackerman, *Constitutional Politics/Constitutional Law*, 99 YALE L.J. 453 (1989); Jules L. Coleman, *Rules and Social Facts*, 14 HARV. J.L. & PUB. POL'Y 703 (1991); Jules L. Coleman, *Negative and Positive Positivism*, 11 J. LEGAL STUD. 139 (1982); Richard H. Fallon, Jr., *A Constructivist Coherence Theory of Constitutional Interpretation*, 100 HARV. L. REV. 1189 (1987); Owen M. Fiss, *Objectivity and Interpretation*, 34 STAN. L. REV. 739 (1982); Michael S. Moore, *Three Concepts of Rules*, 14 HARV. J.L. & PUB. POL'Y 771 (1991); Michael S. Moore, *A Natural Law Theory of Interpretation*, 58 S. CAL. L. REV. 277 (1985); Gerald J. Postema, *Coordination and Convention at the Foundations of Law*, 11 J. LEGAL STUD. 165 (1982); Antonin Scalia, *The Rule of Law as a Law of Rules*, 56 U. CHI. L. REV. 1175 (1989); Frederick Schauer, *Rules and the Rule of Law*, 14 HARV. J.L. & PUB. POL'Y 645 (1991); Joseph W. Singer, *The Player and the Cards: Nihilism and Legal Theory*, 94 YALE L.J. 1 (1984); Sunstein, *supra* note 28; Laurence H. Tribe, *The Curvature of Constitutional Space: What Lawyers Can Learn from Modern Physics*, 103 HARV. L. REV. 1 (1989).

Modifying Figure 5 from the introduction,<sup>99</sup> I can depict this situation as follows:

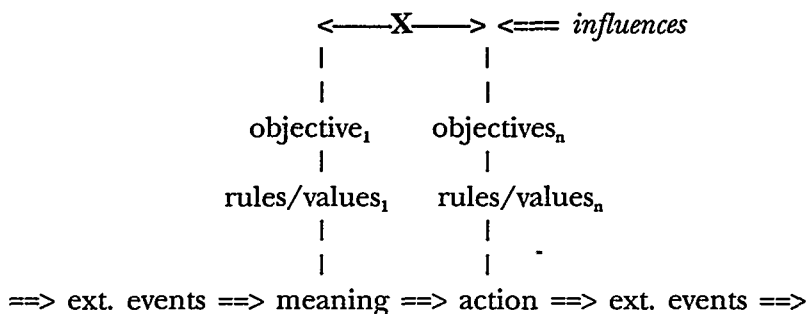


Figure 8

The subscript  $n$  indicates that any number of sets of objectives, rules and values can be generated by  $X$ . The subscript  $1$  identifies the physical rules and values related to  $\text{objective}_1$ , survival. "Influences" equals the practical reasons and other considerations for changing objectives, rules and values, as described above, and as referenced in Sentence 2b, reprinted here for convenience:

*Sentence 2b* Gret ought to make a *decision* not to steal, *because* of practical reasons A, B and C which are unrelated to moral worth; Gret has the ability to make free willed decisions; if Gret is *persuaded* by practical reasons A, B, C, or any other considerations, then Gret may decide not to steal.

Assume that I think that not stealing enhances the odds that the human species will survive and that I favor that objective. I would like it, therefore, if Gret decided not to steal. Since Gret has free will, I am faced with the need to influence Gret's decision through persuasion. Gaining free will altered the is/ought relationship, but it did not destroy it. I did not lose the underlying physical basis for not stealing. Instead I have gained the ability

99 See *supra* text accompanying note 17.

to rationally understand it and perhaps improve on it. Therefore I have not lost the objective ground for helping Gret decide whether to steal. As a matter of logic, I do not need to bring in questions of moral worth. Instead I need to demonstrate that the rule against stealing derives from and supports the objective end of survival, as in Sentence 3b:

*Sentence 3b*      Not stealing ought to be a value in physical system A, because the system does X, and not stealing does Y to support X.

The demonstration becomes the practical reason for Sentence 2b. If Gret does not have free will, there is no reason to make any logical demonstrations.<sup>100</sup> On the other hand, because Gret has free will, I don't know how Gret will respond to my demonstration. Other considerations besides my logical argument may enter into the picture. Those considerations are likely to involve other practical reasons, as well as Gret's value structure. Value structures are changeable and usually tied to notions of morality. If we get into a debate about moral values, I feel I'm lost. Moral arguments are known to be hard to win, unless Gret and I have a common ground from which to start. But if Gret judges my logical argument from the point of view of an unexpressed value, I can lose my argument anyway, never having debated the real issue. I contend that debating values is the real issue because Gret and I can make two logically consistent but contradictory arguments, given the structure and ordering of our values. Gret and I may reach logically defensible but contradictory conclusions.<sup>101</sup>

Rationality is an analytic tool. It can be placed in the service of any values, any objective, and any set of rules. The outcome of a rational argument depends on the values employed in the argument. There is no point in debating Gret's logic until there is at least a reasonable concurrence in our values and in the objective to which our argument is directed. In other words, Gret and I have to have reasonably similar starting points, regardless of whether we believe values to be subjective or objective.

The distinction between subjective and objective values makes a difference. If it is believed that values trace only to subjective

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100 Gret may be a young child or otherwise incapable of entertaining logical argument. My alternatives are to assist Gret develop such capabilities, train, or incarcerate.

101 See my "not surviving" argument *supra* text accompanying note 94.

preference and subjective criteria, then some form of achieving concurrence in starting points besides rational argument will have to be used. The initial or threshold arguments would need to be persuasive efforts designed to shift somebody's values. Hume's is/ought distinction would apply to all values. If it is believed that some values can be traced to a physical reality, then rational argument can be used to show that connection and that reality. The initial issue before the parties would be whether the values in the argument have been rationalized to physical reality. If this is the situation, then the logic which purports to demonstrate which values are objective can be analyzed. An is/ought relationship would exist relative to some values.

I make my logical demonstration to Gret, and lose anyway. Gret says that stealing a few purses and doing a little shoplifting is not that big a deal. Gret's companions do it all the time and no one is hardly ever caught, and only once was somebody injured. It's just my personal opinion that not stealing ought to be important to people. Worrying about survival of the species is not that important either. The species will take care of itself. Besides, Gret doesn't steal from friends, but only from strangers. Strangers should look after themselves.

Gret seems to be making two points: (i) My notion that values can be rationalized to physical reality yields only relative and subjective opinions as to what those values are and how they should be ordered. My process is in reality just another subjective morality. (ii) The central objective in my system is survival of the species. The central objective in reality is individual or group survival, rather than species survival. Values, even if objective, will vary from individual to individual, and from group to group, as is the case now. Groups compete with each other. Such competition is one of the physical rules of survival. If I put the real objective into my system, there would not be a common value structure with which to work.

The first point will be taken up now. It calls for a definition of objective and subjective morality. The discussion of the first point will be used to partially address the second point. The question of competition and common values will be more fully addressed in Part V.

As a control condition, assume that one of the objective ends of the forces which shape human life is survival of the human species. Assume also that the higher brain functions of humans (the physical subroutines of X) are functioning as we currently

know them *except* that we do not have the ability to make any free willed decisions. Instead, assume that what we think of as subjective free will is in fact an objective physical process which *on balance* makes decisions which enhance the prospects of human survival. Although any given decision might be indeterminate (like the events in subatomic space), nevertheless across a large number of events the outcomes are predictable in that they generally support survival. In other words, the probability distribution associated with "physical decisionmaking" favors survival of the species.

Events occur. Life goes on. The forces acting on and through humans, operating in accordance with the rules which describe how energy reacts to energy, including the forces which determine decisions in this "physical will," churn out certain results. Rules/values<sub>1</sub> gradually change to rules/values<sub>n</sub>, in accordance with Figure 8, but only under the influence of physical forces. The objective stays the same. Call this hypothetical state of affairs the "unaltered" process. It is not necessary to imagine what this state of affairs would actually be like, because the real state of affairs I am analyzing includes free will.

Having set up the imaginary "unaltered" process for control purposes, I can now analyze what happens when individuals have free will. The initial objective of the system, objective<sub>1</sub>, is still assumed to be survival of the species.

Because I have free will, I have the opportunity for subjective decisionmaking. I can make one of two types of decisions. I can freely select an alternate end of my own choosing in place of objective<sub>1</sub>, reducing objective<sub>1</sub> to a lower status or eliminating it, or I can accept objective<sub>1</sub> as my primary end. The first type of decision institutes and actualizes a subjective end. The second type of decision affirms the objective end and attempts to actualize it.

When I institute an alternate subjective end, I actualize my value structure in accordance with how I think things ought to be. My subjective end and its supporting values may be grounded in my own inclinations, or I may have been influenced to adopt the views of others. I might choose, for example, to place individual short-term goals ahead of species survival. An is/ought relationship exists between my value structure and whatever it is that motivates or generates that value structure. An is/ought distinction may exist between my values and physical reality. If I formulate my value structure into a set of rules, I have created a subjective morality which will have objective consequences on the surrounding physical world.

When I affirm objective<sub>1</sub> (species survival), I have two ways to attempt to actualize it. One way is to try to forecast the results of the “unaltered” process and then try to do those things. Since I don’t have any way of knowing with certainty what the unaltered process would produce, this approach will most likely introduce a reordering of future events despite my best efforts. The second way is to try to improve on the success or efficiency of the unaltered process. Since I still don’t know what the unaltered process would produce, I have no way of knowing if I’ve succeeded. Under either approach, I will actualize some set of values I think support species survival.

Both decisions (instituting subjective ends or affirming the objective end) are, by definition, *subjective*. They are subjective by definition because both types of decisions require a commitment by free will. Free will has to be motivated to commit. Either decision will produce objective consequences and, like the addition a single protozoan, will alter the configuration of the universe. The second type of decision has the added problem that other subjective values, unrelated to species survival, may come into play despite my best efforts. These values may enter into my decisionmaking process, as expressed or unexpressed values, and alter intended outcomes. Even if no subjective values come in, there may be several solutions to a problem, each of which supports survival. A choice will have to be made from among these alternative solutions. Such choices will produce different sets of consequences for real people, even though the net effect of each is to support species survival. Different people may not survive as a result of one choice or the other.

There is a distinction, however, between the two types of decisions. The distinction lies in the *criteria* used to make the decision. Both decisions are subjective, but the character of the criteria is different. Changing the factors which go into any decision changes the stream of physical consequences which flow from the decision. A decision to actualize a subjective end will either look to the future consequences which support that end, or, if the decision is based on a set of absolute rules or values, then the decision will look to an analysis of which rule to apply. A decision to support species survival looks to future consequences relative to survival of the species as the criteria for the decision. Survival of the species includes survival of succeeding generations.

Observe how the nature of my problem in influencing Gret’s decision changes if Gret, for whatever reason, (i) decides as a

general matter that the human species ought to survive, (ii) places as a fundamental value in Gret's personal value structure any notion of human survival which includes *both* the physical health (reconstitution) of a specific group of individuals *and* the continued existence of generations of individuals in that group beyond the current generation (propagation), and (iii) decides to actualize the objective and the fundamental value with the aid of rational thought.<sup>102</sup> By fundamental value, I mean that human survival (in the form of either small or large groups, as Gret chooses) is given a status sufficient to assure that it is considered during Gret's free willed decisionmaking process. Realistically, survival of Gret's group will not be the only value Gret has.

Once given some form of group survival, including propagation, as one of the fundamental values in Gret's value structure (value<sub>n</sub> in Figure 8), the physical process of rationality will be energized in service to that value and its underlying objective. Rationality relates things as they are or have been to how they ought to be in the future in light of selected objectives and values. Rationality will then produce one or more "suggested" solutions based on the consequences of alternative actions relative to the value and objective which Gret has selected. An is/ought relationship exists as to this part of the process because the solutions generated are descriptions of the physical probabilities associated with the alternatives.

These are *rational oughts* which represent Gret's best perceptions of the physical rules of survival, as in Sentence 2b.<sup>103</sup> They include adjustments to the physical rules encoded in Gret's brain, since not all such rules enhance survival. Gret's inference takes the form, "humans in the selected group, including humans not yet born, ought to survive if I decide to do A, B, or C; they are most likely to survive if I do B." The nature of the problem has changed, because at this point in Gret's decisionmaking process Gret and I have a debatable, but objective, issue as to the actual probabilities associated with the consequences of Gret's alternative solutions. This will include debating with Gret what other groups will do in response to Gret's alternative solutions. It will also include debating the probable effects relative to survival of things like destruction of the Earth's rain forests, as in *Thought Experi-*

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102 The problem of gaining this degree of initial concurrence will be discussed *infra* Part V.

103 See *supra* text following note 84.

ment #3, and depletion of the ozone layer. Gret's group cannot survive if some other group takes an action which eliminates Gret's group. These debates may alter my outlook or Gret's outlook. What we learn depends on how we focus on things and on what we choose to study.

Gret's suggested solutions, with any adjustments, will then be factored into the balancing or weighing process as part of the rest of Gret's decision. The is/ought distinction may apply to the rest of the decision, depending on whether the other values are rationalized to physical reality. The higher the value placed on human survival, the more likely one of Gret's survival solutions will be actualized.

Subject to the *physical* limitations of rational thought, this process will enhance the chances that Gret's group will survive. How many groups survive depends on what all groups do in relation to all other groups, what mix of rules and values are followed by those groups, what the physical rules of survival tell us about group interaction (the objective test), and what rational analysis determines enhances the odds of survival in light of the objective test and the current mix of rules and values.

I have two observations. First, I agree with Gret that the initial step in this process is relative and subjective. The fundamental value in the system is survival of the species in the form of individual groups.<sup>104</sup> Free will must commit, consciously or subconsciously. Unexpressed values may enter the picture and distort objectivity. I do not, however, agree that this is just another subjective morality. Once free will commits to the initial objective, value, and mode of analysis, decisions will be made based on physical assessments related to those factors which support survival over the long run,<sup>105</sup> with conscious awareness of the *objective test* expressed in the physical rules of survival. Decisions which support survival or do not detract from it are accepted. Decisions which disparage survival are disfavored. Any of Gret's alternative solutions, within the limits of rationality, will permit Gret's group to survive, unless some outside factor overwhelms it. That outside factor may be an unforeseeable physical calamity or the action of another group. The process appears to be neutral as to the philosophical, moral and religious beliefs of individual groups.<sup>106</sup>

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104 I will explore the consequences of this *infra* Part V.C. In the meantime, it seems to be a realistic statement of human behavior.

105 Factors which support survival will be considered *infra* Part V.B.

106 The problem of selecting between multiple solutions will be considered *infra* Part

Second, the outcome of this process appears to match the outcome of the hypothetical control condition I set up. In the hypothetical I assumed that what we think of as free will is in reality a physical process which *on balance* makes decisions which enhance the prospects of our survival.<sup>107</sup> We achieve the same general result, with perhaps a different ordering of events, when we consciously or subconsciously elevate group survival to the status of a fundamental value to be considered when we make any decision. In either case rationality becomes a physical check on the other considerations which influence our decisions.<sup>108</sup> In the hypothetical case, the subjective disappears. In the real world case, as far as we know it to be the real world case, the subjective has to adopt the objective.

Herein lies the basis for my claim that there can be such a thing as an objective morality. It consists of a physically based set of rules of human conduct, and their associated values, which derive from and support the objective of physical survival. Those rules describe processes which are intrinsic to the nature of the physical world, observable by humans, relevant to human conduct, and not mere products of human imagination.<sup>109</sup>

As descriptions of physical processes, these rules are like other descriptive rules which describe the general forces operating in the universe. They describe the forces operating on human life, either to sustain it or to defeat it. There are two types of rules within the overall set of such rules. The first are "ought" and "ought not" statements which we developed over the years during reactive phases of the linear cycle of human life. We perceive these rules, project their effects into the future and modify them by rational analysis. We ought not steal because we might not survive the act of stealing. We ought to bury acorns for the winter because we might not survive the winter. Not every physical rule we perceive is part of this morality, because not every rule we perceive supports human survival. The second are "ought" and

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V.C.

107 If this condition does not obtain, through the cumulative actions of either physical or free will, then existing physical probabilities would favor the extinction of humans.

108 For the general purposes of this essay, I take rationality to include the entire process by which we make physical inferences based on the physical facts we observe in objective reality. Under a broad definition this would include our notions of intuition and insight, *provided* that such intuitions and insights are grounded by an is/ought relationship to physical events.

109 See *supra* Part I.C.

"ought not" statements we develop during proactive phases through experiments. These experiments can be hypothetical or physical. Physical experiments can be scientific or historic. We advance an action and see what happens. We study the actions others took and analyze what happened. We learn from the reactions what to do and not to do, and project the results into the future. Soldiers, going somewhere, learn to break step when they cross a bridge. We have learned that the harmonics we set in motion can bring the bridge down.

These rules, like the rules of physics and thermodynamics, are in and of themselves free of moral worth connotations, although the central objective has to be accepted. The rules describe the perimeter or boundary constraints which physical reality places on human endeavors. The rules do not describe what to do within those constraints, nor do they necessarily describe how to balance every conflict which arises when more than one alternative action supports survival. What the rules describe is how to avoid not surviving. Resolving conflicts within the boundary constraints may require moral worth considerations as to how benefits and burdens of alternative survival solutions are to be distributed. Then again, resolving such conflicts may yield to rational analysis based on physical rules.<sup>110</sup> If moral worth considerations are required, then the is/ought distinction may apply.

I can now define "objective morality based on survival" as a morality which recognizes as its criteria for correct behavior physical rules of survival perceived by reason and projected into the future by rational analysis. Although the rules involved are in and of themselves free of moral worth connotations, I can describe them as moral rules because they are incorporated as part of the rule/value structure of a human. In contrast, I will define "subjective morality" as a morality which recognizes among its criteria for correct behavior the interests of a free willed subject either (i) *within* the constraints of survival, or (ii) *against* those constraints.

What I've endeavored to show in this part of the essay is that the physical rules of survival, some of which are encoded in our brains and some of which have been transformed into normative statements by acts of free will, can be perceived through reason and ought to be adopted, if humans want to survive. I have not yet shown how the rules of survival resolve group interactions, and

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110 See, e.g., RAWLS. *supra* note 4 (reflective equilibrium).

I have not yet shown whether there is an objective basis for deciding whether the human species ought to survive.

# V. DEVELOPING A THEORY OF VALUES

## A. *The Range of Outcomes Which Support Survival*

At the conclusion of Part IV, I gave definitions for objective and subjective moralities. As defined, an objective morality based on survival functions as a constraint or check on subjective moralities. Physical forces, including the physical forces which operate within other life forms, are a limiting factor in what we can do. Although we do not ordinarily associate the word "value" with physical forces, assume for the moment that I will be able to show the relevancy of such an association. With that proviso, I can depict the relationship between the physical world and free will schematically as in Figure 9 below.

The larger circle in the drawing represents all possible physical outcomes in which humans would survive. The smaller circle represents the actual consequences of human value systems:

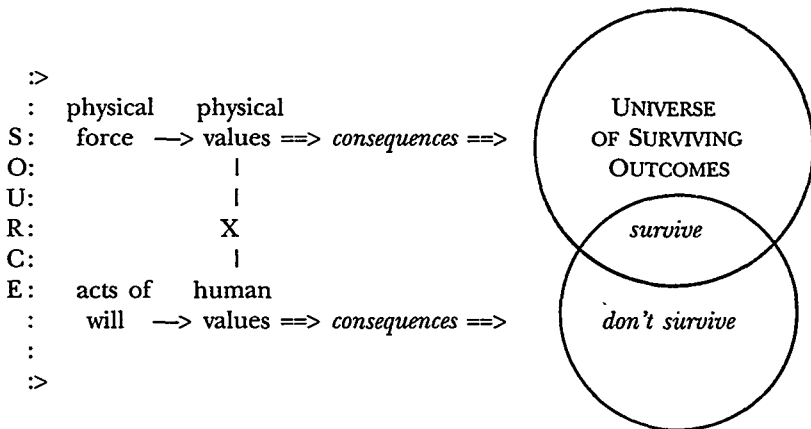


Figure 9

Figure 9 is to be interpreted as follows. Individuals make choices by acts of will establishing or fulfilling human values and generating actions which have consequences in the physical world. Some of these choices lead to a failure to survive. People die. Sometimes it is the people who establish the human values and select the particular actions who die. The thief is shot during a bank robbery. The rock climber falls to her death. At other times

it is other people who fall victim to those choices. A pit bull attacks a neighbor. A group of gunmen kidnap and later execute their prisoners. Human history is full of such other times. Objective processes can be used for subjective ends.

"Failure to survive" does not have to equate to physical death. As a rational tool, the phrase can be used as a term of art encompassing anything which can said to be no longer surviving or which has been placed in jeopardy of dying. Failing to survive can be any outcome identified in a risk analysis where risks have been shifted in favor of dying (against some rational norm). Things are said to rise and fall—the stock market, the Roman Empire, the fortunes of a family, and the prospects for a football franchise or for the whale or spotted owl. Failing to survive may be viewed more as a direction than a finality, as when I make the wrong move in a chess game. The direction may or may not be reversible, depending on the circumstances.

The human brain is equipped to foresee consequences. It can take advantage of the consequences it likes, and forestall or counteract the ones it does not like.<sup>111</sup> The brain does this by taking into account and responding to the consequential effects of physical forces. Some processes can be set in motion the effects of which cannot be averted. To enhance the odds of survival, and perhaps in order to survive at all, the brain must incorporate into its value structure the physical rules and values of an objective morality based on survival and act on those values with foresight.

### *B. Physical Factors Which Support Survival*

Before I get to Gret's second point, that individual and collective values related to physical survival will vary, I want to speculate as to what those values might look like. Variables in a mathematical formula are placeholders for general concepts or kinds of things. I'm interested here in the *kinds*<sup>112</sup> of things which account for physical survival, whether viewed from the individual or collective perspective. I will call a kind of thing a factor.

I suggest in Figure 10 below a general description of a species survival system as a first approximation. The list or schematic is one way of describing the physical factors which determine the

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<sup>111</sup> See *supra* note 60 and accompanying text.

<sup>112</sup> For a notion of functional kind, see Moore, *Law as Functional Kind*, *supra* note 87; Moore, *A Natural Law Theory of Interpretation*, *supra* note 98.

survival of life forms and the relationships which exist between these factors. In developing the schematic, I considered countries, businesses, social groups, ethnic groups, families, individuals and other life forms. I am looking for commonalities. The descriptions which follow the list are important not for their details but for the general notions about rules and values which they are intended to convey.<sup>113</sup>

The schematic shows one objective, listed at the top, followed by three principal values or factors, all shown in capital letters:

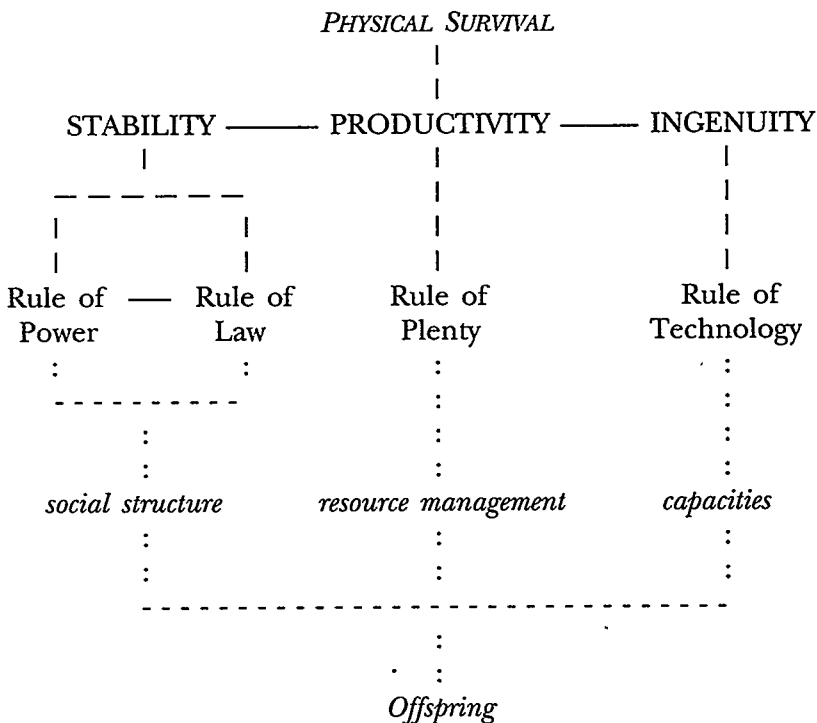


Figure 10

The list is to be interpreted as follows. Physical survival is supported by three principal factors—stability, productivity and ingenuity—to which values must be assigned. Life forms and organi-

113 See Sentence 3b *supra* text accompanying note 100.

zations of life forms—which are stable enough, productive enough, and ingenious enough—survive.<sup>114</sup>

Stability implies all those subordinate factors or values which go to assuring that a particular life form will continue to exist tomorrow pretty much like it does today and that successive generations of the group with which that life form is associated will continue to survive in some form in the future. Stability does not mean rigidity. It means having a structure which can accomodate change without disintegrating. Designing such a structure involves some form of pre-decision risk analysis or post-decision verification (such as trial and error). Rigidity in a bridge or building can lead to its destruction. If a rigid structure encounters forces which exceed certain limits, it will break. In response, engineers have learned to build flexibility into structures to accomodate such forces through bending. Bridges and buildings are now designed to move around a bit, something like a tree bending in the wind. The tree learned this a long time ago.

Productivity implies all those subordinate values which go to assuring that the life form produces the things which are needed to support the objective. It is not necessary that the outputs of a life form be continually expanding in number. The life form or the organization of life forms can be in balance with its surroundings. This depends on what the surroundings are doing. If the surroundings are undermining stability, then expanding outputs may be one way to counteract this. If not, then oversupply may endanger stability. If there is room to grow and resources to accomodate the growth, then the most productive life forms will tend to fill the void. Life forms tend to do this by instinct. Business organizations have learned to plan, and perhaps limit, their growth.

Ingenuity implies all those subordinate values which go to assuring that the life form is equipped to be productive and to find and implement ways to enhance stability. If the surrounding environment is not hostile, then swords are not needed. The surrounding environment is often hostile. Other organisms are not always friendly, and they, and other physical forces like typhoons, compete for available resources. Absent free will, life forms tend

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114 These values and their associated rules are connected and interrelated. Things which can be described under one could perhaps be described in whole or in part under another. For Hart's commentary on minimum content of natural law, see HART, *supra* note 1, at 189-95.

to treat other life forms as if they were physical objects or physical forces. Almost all life forms are in somebody else's food chain or potentially threaten somebody else's growth or existence.

As long as that condition remains, then weapons and other defensive tools are needed, like shelters from the storm. Animals burrow in the ground and build edifices against the wind. One approach is to not wait for problems to arise. Sharpened beaks and axes can be used to tame the wilderness and provide places for growth. Claws and swords can be used to eliminate other organisms which stand in the way or which are in control of resources which are needed or wanted. All of these techniques must stand the test of efficiency and effectiveness. Endeavoring to conquer one's neighbors can destabilize a system. If it does not, then one species or group will crowd out another, perhaps to the latter's destruction. Humans, unlike other organisms, can foresee this state of affairs and take countermeasures in advance to maintain stability which supports survival.

As factors or values, stability, productivity and ingenuity are described by four sets of descriptive rules: the Rules of Power, Law,<sup>115</sup> Plenty, and Technology. These Rules represent the entire set of physical rules, whether known, unknown or unknowable, which regulate or describe how stability, productivity and ingenuity can be physically achieved. They are expressions of how energy reacts to energy. Some combination of specific rules from among these four is necessary to produce an organism that survives.

The Rule of Power says that a surviving organism has sufficient power or energy to move forward in time and overcome obstacles which defeat survival. The Rule of Law says that the power or energy necessary to survive will often be channeled in some way to avoid physical conflict. Avoiding physical conflict

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115 I mean "Law" in a very broad sense to include social custom as well as other voluntary and mandated practices supported by the use or threatened use of power. I do not mean to imply a theory of law by this use of the word "Law". The phrase "Rule of Custom," however, did not capture the full range of rules by which humans substitute orderly behavior for direct confrontations of power. The phrase "Rule of Rules" also does not work because it would not distinguish the confrontation use of power which also follows rules. The phrase "Rule of Law" is intended to connote the non-confrontational use of power, *after* the establishment of the custom, practice or legal rule, to achieve objectives. Power, in the form of either raw physical power or voluntary consent, is tied to the development and actualization of customs, social practices and positive law. The lateral connection in Figure 11 is intended to connote that some customs, practices and legal rules are the result of physical control (threats) while others are the result of the voluntary use of individual power through the exercise of consent.

appears to enhance stability. The Rule of Plenty says that a surviving organism has tapped into sufficient resources to reconstitute itself and produce external results (offspring). The Rule of Technology says that the manner in which it does all this determines its success and efficiency. If the combination of rules work, then physical outcomes under the organism's specific combination of rules will place or maintain the organism in the intersecting portion of the large and small circles in Figure 9, and will enhance the odds that offspring remain in that circle. .

Specific rules, shown on the next line of Figure 10, vary from organism to organism, but each rule appears to fall within these four general classifications or some combination of them. A rule like "the squirrel ought to bury acorns for the winter" is primarily a rule of plenty. It describes how the squirrel secures the resources needed to remain productive. The jaws and teeth of a shark describe part of the shark's rule of technology. They make a formidable offensive and defensive weapon. They are used to support productivity. An amoeboid protozoan's bifurcation process is primarily a rule of plenty (resources are consumed and a product is produced), although it also describes a technology. Both stability and productivity depend on technology. The protozoan's cell structure, for example, is a rule of technology. It defines the boundaries of the protozoan and stabilizes the location of internal chemical reactions. An organism that wants to eat the protozoan must get through the cell wall before it can lunch freely.

The rules for non-free willed organisms vary because of elements of randomness and trial and error. Technologies change through experimentation during the linear cycle of survival. Things which don't work are eliminated. Technologies also change as a result of DNA modifications and other adjustments to an organism's biochemistry. Perhaps these modifications are feedbacks. Perhaps they are random occurrences. Either way, things which produce failures to survive are eliminated under the objective test contained in the physical rules of survival.<sup>116</sup>

Things which do work diverge. Things which work take off into the physical world in different directions and encounter different sets of physical circumstances. This process leads to further modifications and further diversity in technological approaches which satisfy the physical factors of survival.<sup>117</sup> The objective end

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116 See *supra* text following note 79.

117 This would appear to satisfy the Second Law of Thermodynamics, which says that

of this diversity in life forms seems to be to enhance the odds that some type of life survives.

The requirement for stability plays out through the Rules of Power and Law. We sometimes associate this process with a phrase such as "survival of the fittest." We tend to equate that phrase with a hierarchy of powerful individuals. The social structures of primates and other mammals are influenced by rules which powerful leaders "decided" to adopt. Among non-free willed organisms, the power structures which have developed under such influences provide stability for the social group and usually a means for transferring leadership roles and resolving disputes without destruction of the social group and without constant internal warfare. Internal tensions exist, but the conflicts are usually not mortal ones. Over the long run, groups with effective combinations of rules for dealing with internal conflicts and external encounters with other groups and other external forces will survive.

While I do not accept a phrase like "survival of the fittest," preferring instead a phrase like "effective combination of rules produced through a variety of competitive and non-competitive techniques,"<sup>118</sup> I accept nonetheless the idea that rules of physical conduct developed over time through the interactions of individual power sources. Power is constantly interacting with power. Energy reacts to energy. Individual organisms are systems of energy. The rules that developed are a function of the possible ways that energy can react to energy.

During exchanges between individuals, the wants, drives and needs of one individual come into contact with the wants, drives,

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the entropy of the physical world is always increasing. A common statement of the Second Law is that the physical world tends to disorder. This is easily misunderstood. It does not mean chaos. It means that things don't always happen the way we think they are "intended" to. For our purposes, the Second Law says that if there are twelve ways for things to happen (e.g., throwing a pair of dice) and *nothing interferes in the process*, then all twelve ways will eventually be tried out through random selection or occurrence. If we had six dice in a game and throw them all repeatedly, we would not expect all sixes very often. But if the products which came out of all sixes were somehow more stable and could gradually supersede the products which came out of all other throws, then the world would eventually be all sixes. All sixes might represent life and its particular sets of combinations. See generally SCHRODINGER, *supra* note 82 (discussing a physical theory of life); FEYNMAN, *supra* note 4; 44-1 to 44-10 (describing Second Law); BARROW, *supra* note 39, at 182-210 (describing Second Law); WICKEN, *supra* note 46 (discussing wave functions and probability distributions); BROOKS & WILEY, *supra* note 46. See also STEPHEN H. KELLERT, *IN THE WAKE OF CHAOS, UNPREDICTABLE ORDER IN DYNAMICAL SYSTEMS* (1993).

118 This is a phrase of my own choosing. See my comments *supra* note 80.

and needs of another individual. These exchanges led over time to rules about how power is distributed within social groups. These rules may have been worked out initially through physical conflict. Over time, however, rules also developed which allowed power to flow and disputes to be resolved without physical conflict. Some animals developed elaborate sparring or "sizing up" rituals. The advantage of such rules is that neither contestant suffers a failure to survive in the process, leaving both contestants in a position to continue to support the collective needs of the social group or pursue their individual objectives. Humans are an example. Under such circumstances, the Rule of Law becomes a substitute for physical conflict.

Other exchanges between members of a social group may have led directly to rules supporting cooperative behavior without involving an initial phase of physical conflict. As aggressive as mammals tend to be, resolving physical conflicts does not seem to explain all the rules related to courtship, mating, food supply, hunting, migration, information exchange and the raising and protection of offspring. Adaption and accomodation are means for developing cooperative rules without physical conflict.<sup>119</sup> Satisfying mutual needs through consent appears to be a more likely basis for some rules. Exercising consent is one means of exercising the power individuals possess. Under such circumstances, the Rule of Law becomes an instrument for achieving objective ends.

But this description of the flow of power during exchanges is still shortsighted. Every living organism which is surviving possesses the *power to survive* within a context and the energy to overcome obstacles within the limits of that energy. All individuals possess power. They are an expression of the flow of energy. Organisms may not always be aware of the extent of the power they physically possess. Most organisms do not have the rational skills necessary to learn how to manipulate their potential power.

If organisms or organizations of life forms possess power, and become *conscious of that fact*, then they can use that power, singly or in combination with others. A lone gunman can hold a large group at bay. A small group can dump tea into the harbor. A large group can march on a city. Changes in the recognized balance of power are likely to lead to changes in the rules by which

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119 See generally MAYR, *supra* note 15.

a social group is structured. When energy meets energy there is a reaction. Adjustments take place.

The reaction does not have to lead to physical conflict. Adjustments can take place through accomodation, recognizing the change in conditions by making a corresponding change in the rules and values which support survival. When you bring a new animal into a home which already has one, fur is likely to fly for awhile. Usually the two brains adjust to each other as new rules are worked out. As long as the new rules work and the new balance of power remains intact, the new arrangement will survive. An equilibrium has been reached.

If the new equilibrium is reached without destroying the social structure in the process, then the social system was stable enough to accomodate change.<sup>120</sup> If the conflict turns deadly, and the new equilibrium is reached only after the old social system disintegrates and a new one is created, then the system was not stable. How stable the new system is depends on which combinations of rules are selected from among those described by the Rules of Power and Law. With free will, conscious selection of rules is possible.

In Figure 10, the rules on the line below the four Rules are variable placeholders which represent the specific rules which describe a species or a sub-group of that species: social structure, resource management and capacities. For organisms without free will, these specific rules developed physically over time during the linear cycle of survival. For protozoans they are descriptive. For wolf packs they are quasi-normative. For prehistoric humans they are pre-modern normative rules. For modern humans the specific rules have become normative.

My argument from Part IV is that at least some of these normative rules are transformations of physical oughts. Not stealing, for example, is a physical ought which supports stability and productivity. Stealing destabilizes the system. The value of not stealing can be identified without discussion or involvement of the notion of moral worth *given* the overall objective to survive. My argument from Part IV is that humans have the ability to perceive which values support survival and which do not and then to adopt the ones that do, with modifications made through proactive experimentation and contemplation to fit the circumstances. Such values are

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120 See generally RAWLS, *supra* note 4.

objective. They will take effect whether we respond to them or not.

### *C. Relativity of Values; Constancy of Factors*

In the previous two sections I have been exploring the notion of "value" separated from the notion of "moral value." In this section I develop the notion of objective values and objective factors into a general theory. I then respond to Gret's second point, that individual and community values will vary. I endeavor to show that a common value structure exists which supports species survival.

As to "value" and "moral value," the question is whether something can have value outside of our interpretation of that value. That is, can "value" exist outside our heads. As with the word "ought," this depends on what we mean by "value." We say things like "this diamond has value." The objection is that the value of the diamond being signaled in the sentence is not objective, but subjective. The value of the diamond is in our heads. According to the objection, what we mean is that "the diamond has value to a diamond-cutter, or a customer" or "the diamond has value to me as a remembrance of my grandmother or grandfather." The objection is that we have truncated the sentence, much like we did with "ought" statements.

The general form of the completed sentence is "this thing has value to that thing because of X, Y, or Z." One or both of the things referenced in the sentence could be a human, but neither has to be. For example, we can say that acorns have value to a squirrel, or that a den has value to a wolf. On the other hand, we do not ordinarily say that hydrogen has value to the sun. We usually say that hydrogen is used by the sun to produce light. But we could say that hydrogen has value to sun, if we know what we mean by the statement. For example: the objective end of the sun as currently constituted is the production of light. Without hydrogen the objective end would be darkness. The process of producing light in the sun requires hydrogen. Hydrogen has value or utility *relative* to the *process* of producing light.

Distinguishing between the sun and a squirrel is important when we are trying to distinguish between what an animated system does that is different from an inanimate system. The distinction is not so important if we are trying to analyze how physical processes work in general. Observations of how we ordinarily use

language suggest that we generally use the word "value" to signify the utility of something to a *living* process, usually humans. Food has value to a protozoan or a wolf because it fuels the physical process of surviving. But food to a life form is like hydrogen to the sun. The fact that we typically reserve the word "value" to describe an attribute of the human mind does not change what is happening in a purely physical process. The squirrel is a physical process with an objective end, to survive, like the sun is a physical process with an objective end, to produce light. Gladys is, at least in part, a collection of 10,000,000,000,000 (10 trillion) operating cells.<sup>121</sup> Gladys, like the squirrel, has an objective end.

The notion of value so described is a relative thing. Value describes the relationship between two physical objects in light of a process or objective end. The value or utility of something will change depending on the objects and processes involved. This does not mean that the value of something is indeterminate and subjective. It means that value is a variable. Variables are placeholders in mathematical formulas.

A simple formula is  $d = r \times t$  (distance equals rate times time). All three symbols are variables. We also call them factors in a mathematical function. Distance is a function of two factors, rate and time. We can't plug in any values we want, because the formula describes a physical relationship. Once the values of two of the factors are known, the value of the third factor is completely fixed by the intrinsic relationship between these aspects of physical reality. Moreover, the range of possible values for each factor is limited, depending on the nature of the physical relationship being described. For example, none of the values can be negative. If  $d$  is greater than zero, then neither  $r$  nor  $t$  can be zero. In these circumstances, none of the values are subjective, but they are relative.

Whether or not it is possible to identify an absolute or intrinsic value in an object or a process, we are nonetheless able to identify the specific relative weights of such values, given the objective end involved. An acorn is relatively more valuable to a squirrel than to a protozoan. But an acorn has *a* value to the squirrel once a given set of factual circumstances is known. If survival is the objective, then the objective value of an acorn is determined by the utility of the acorn relative to the squirrel's

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121 See *supra* notes 43 and 52 and accompanying text.

chances of survival. That value is descriptive of *that* set of factual circumstances.<sup>122</sup> Values can therefore be derived from facts, despite Hume's is/ought distinction or the version of it known as the fact/value disparity. There is, under these circumstances, a fact/value relationship. There may be an is/ought distinction, however, in determining which combination of values to select from among those combinations that work.

To illustrate the distinction between "factor" and "value," consider the following: If I need to move a piano and a couch through a doorway which measures three feet wide and six feet tall, the two factors which control the size of the piano and couch I can select are width and height. I can take anything through that doorway which measures less than three feet by six feet in some direction. The range of values which will work for my furniture is limited by the physical reality of the doorway. If there are other obstructions, such as sidewalls or a narrow entrance hall, then a third and maybe a fourth physical factor enters into the picture. The range of values for the length of my furniture is now limited by the additional physics of the situation. The longer my piece of furniture, the narrower it has to be to turn through the doorway and still miss the walls. The value of the factor, length, is now tied to the value of the factors, width and height. All of these values may vary, but only within interrelated limits and a number of absolute limits. I am free to select any set of values I wish provided they meet the minimum requirements established by physical reality. Shooting someone with a gun is an example of an absolute limit.

With respect to survival, the factual base we have for analyzing which rules work includes the history of life forms on Earth and the results of scientific experiments. More than one set of rules work. By comparing the rules which have worked and which have not worked, we can determine what the *factors* are which affect survival. In the previous section I referred to stability (S), productivity (P), and ingenuity (I) as the principal physical values or factors related to survival. To clarify this, I need to say that S, P and I are *factors* which remain constant. Values can be worked out which fit these factors. I can vary these values only within the limits of physical reality. Mathematically, I would say that physical

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122 We routinely talk about generating mathematical and experimental values. These are specific values which signify and describe a relationship between objects.

survival, once given an operating environment, is a function of at least three factors: S, P, and I. There may be other factors. These factors are variable placeholders in some matrix of factors that determine whether an individual life form or a collection of life forms survives over time.

The values for S, P, and I can vary within certain ranges and only in certain ways with respect to each other and with respect to the surrounding environment. The operating environment is a key factor in determining which sets of S, P, and I will work. Consider the rabbit's solution to its environmental circumstances. The rabbit has few defenses (rule of technology). If it produced only a scattering of offspring (rule of plenty), the rabbit as a species might disappear.

The surrounding environment is itself a variable, although one which is usually outside of the direct control of the species involved.<sup>123</sup> The operating environment includes the behavior of inanimate objects (like earthquakes) and the behavior of animated objects (other life forms). We know that the set of workable solutions for S, P and I is finite, because we have seen species come and go. Consider the dinosaur. Rules which once worked no longer work. Other species may yet go as their environment changes.

For example, consider the whale. It's primary defenses are its size and mobility. For awhile these were significant barriers to other life forms. Humans overcame these obstacles through advances in technology. Human values for S, P and I were strengthened relative to other species. The balance of power changed, and whales, which do not reproduce like rabbits and do not have other defenses, found themselves ill-equipped to handle the new operating environment. The set of whale values which plug into the S, P and I formula no longer support survival if humans decide to extinguish them.

Now consider human groups relative to other human groups. Human groups have experimented throughout history with a variety of combinations of social, economic and technological rules, changing their values for S, P, and I. Some of these combinations have worked for a long time. Others at least for awhile. A third group of combinations have failed. Sometimes, entire civilizations have disappeared. Other times it was the group in charge which

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123 In other words, S, P and I must vary as a group in response to the given environment.

disappeared (either physically or relative to remaining in power). Sometimes the rules did not work even though the general operating environment around the group remained stable. The group cratered internally. Other times, the rules ceased to work as the surrounding environment changed. The Roman Empire was overrun. Either way, where combinations of rules have not worked, the rules have had to change. These changes have occurred either through armed conflict or through a process of adaption and accommodation.

Throughout this process of collective experimentation, individual humans and small coordinated groups of humans have continued to survive. Why? It appears on the face of history that despite the flow of collective power and the adjustments in collective rules, the defenses of individuals and small groups have not been breached to the point of eliminating all individuals, and therefore the species. The species survives through individuals and small groups of individuals. Individuals have continued to cooperate with individuals to produce offspring, and resources have continued to be available to reconstitute bodies and to constitute new ones. Individuals possess the power to survive and the manner in which they cooperate in small groups appears to be one of the major factors in determining why the species continues to survive.

In this view, the stability of small groups (families, clans, neighborhoods) would seem to have been a relatively more important factor to species survival than the stability of large groups, even though what large groups do is a major factor in determining the operating environment of small groups. It would seem likely to remain that way unless some event occurs, traceable either to a failure in the rules of some human group at some level (e.g., rain forests or ozone depletion) or to the success of a rule of survival in some other type of organism (e.g., AIDS virus), which succeeds consequentially in piercing the defenses of all humans.<sup>124</sup>

This does not depreciate the numerous occasions in history where large and small groups have attempted to jeopardize or eradicate the survival opportunities of other groups. To the con-

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124 Only one clan or neighborhood has to survive a world wide calamity for the species to survive and to regenerate. If we assume that approximately every twenty people make a potential survival system, then we presently have more than 300 million different such groups in existence.

trary, those episodes offer proof of both the resiliency of human groups to survive and the ineffectiveness, at least in modern history, of subjective value systems based on physical conquest. In the process, however, large number of individuals have experienced a direct failure to survive. Operating still on the assumption that all humans ought to survive and that almost all humans desire to survive, these episodes reveal weaknesses in the S, P, and I values adopted by humans collectively. Those weaknesses lead to failures to survive, usually on both sides of a conflict.

Through the study of the history of life forms and the study of science and applied science we have some idea, albeit incomplete, of which rules and values promote survival and which ones disparage it, at both the large and small group levels. We have some idea of which values for S, P and I are viable and which ones are not. It seems safe enough to say, based on rational analysis of the physical probabilities involved, that stealing, for example, destabilizes a survival system and managing scarce resources supports rather than detracts from productivity. If so, then the latter becomes a *positive value* or "*virtue*" in the system, while the former becomes a *negative value* or "*vice*."<sup>125</sup> The values are relative, but not subjective. Notions of moral worth do not seem to be needed to make these determinations. The determinations are rational and realistic. In the same vein, violent conquest is a weak use of power, relative to the survival of the small groups who actually carry the species forward into succeeding generations. Violent conquest leads to failures to survive among the members of the conquering group as well as members of the defending group.

To be viable, however, the survival system of a given group has to take into account the objective consequences of the decisionmaking processes of all other individuals and groups, including the larger groups, such as cities and nations, to which the given group belongs. There is no assurance that the perceived survival interests of my group coincide with the perceived survival interests of other groups,<sup>126</sup> or that one or more of these groups

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125 See HUME, *supra* note 4, and text accompanying note 24. See *supra* Sentence 3b and text accompanying note 99.

126 See *supra* Figure 7 at note 90 and accompanying text discussing six variable system.

have not modified actual values for subjective purposes which disparage survival. The situation in the minds of all individuals in all groups can be depicted as follows:

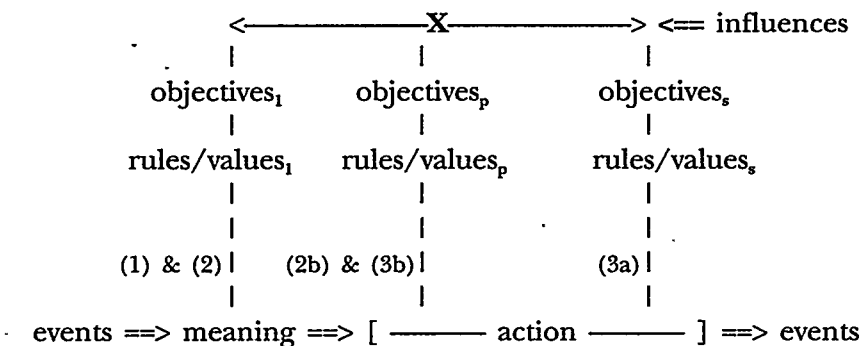


Figure 11

This is a schematic of the system of objective and subjective moralities I defined at the end of Part IV. The objectives, rules and values with subscript "1" are those which humans would follow if humans did not have free will. They are probabilistic ought statements, as in Sentences 1 and 2. Those with subscript "p" are the physical objectives, rules and values we observe from studying science and the history of life forms, as modified and projected into the future by rational analysis. They are *rational ought* statements, as in Sentences 2b and 3b. Those with subscript "s" are subjective moral statements and values, as in Sentence 3a, and any other subjective preferences the individual has. These may enhance or detract from survival. "Influences," as before, are external and internal influences on how X makes decisions. They include our wants and desires and the persuasive efforts of others.

Gret's second point, that individual and group values will vary and therefore there is no common value structure to support species survival, is joined. There appear to be two situations: (i) physical rules of survival for group interaction, and (ii) physical rules of survival for actions within a group. The distinction appears to be one of identity and relative power. In the first case, individuals in each group identify the individuals in the other group as strangers or competitors. Physical conflict is a possibility. Situation (i) can exist even if both groups are part of larger

group, such as a city or nation. In situation (ii), the individuals involved identify themselves as belonging to same group. The group can still be large, such as a nation (relative to national affairs), or small, such as a family. If peaceful resolution of any differences is not achieved, the group may fragment into distinct groups which then interact as under situation (i). Identity is lost. Physical conflict can occur whether or not the group fragments. Aggression is a physical rule encoded in the heads of most mammals. What one does with it would appear to be both a rational and a moral issue.

Under either situation, the objective test remains the same: groups which make decisions which support or at least do not disparage survival will continue to survive unless taken out of the system by another group. I suggest that the objective test, transformed into a forward looking statement warning of consequences,<sup>127</sup> provides the basis for a common value structure which supports species survival, regardless of the type of groups involved, and regardless of the values they have chosen for S, P and I. The objective test can be rephrased as a two step rational ought statement to guide individual group decisions:

- (1) Avoid making moves which lead toward a failure to survive (for both current and future generations).
- (2) Make those moves which enhance the prospects of survival for the participants in the group.

Such a rule rests on marginal analysis. Things happen at the margin. Events have consequences, and those consequences have a direction.<sup>128</sup> The rule tells a group to move away from a failure to survive and toward an enhancement in the prospects of its survival, from whatever point the group is currently at within the circle of human outcomes in Figure 9.<sup>129</sup> First get into the circle which supports survival. Then move away from the edge to enhance the odds of continuing to survive. The rule, if followed for all decisions would appear to maximize the odds of survival. The objective test itself, however, does not require maximization. Humans may chose to skate along the edge. This becomes a question

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127 See *supra* text accompanying note 21.

128 See *supra* text accompanying note 60.

129 See *supra* Part V.A.

of risk assessment against the subjective objectives and values of the individual. The rational ought statement is not obligatory. It merely warns of the consequences.<sup>130</sup>

With respect to situation (i), interacting groups, the two step rule does not require that each of the interacting groups adopt the same set of objective values for the factors which support survival. Nor does it require that the groups hold comparable or compatible moral values and other subjective preferences. It does require that each group adopt *a* set of objective values for the factors S, P and I which are sufficient to withstand any hostile advances from another group. It also requires each group which desires to survive to eliminate any moral values or subjective preferences which will lead the group toward a failure to survive. Any *other* moral values and subjective preferences can be actualized freely within the constraints of the objective test itself. The actualization of such values and preferences become part of the work the group does on the external world.<sup>131</sup>

That work is done on the external world is, like survival, an objective end of the physical forces which produce life. Depending on the theory involved, that work may be as valuable or more valuable than surviving (either objectively or subjectively depending on the basis of the theory). However, the objective consequences relative to survival of that external work, whatever it is, have to be taken into account by all those who desire to survive.<sup>132</sup>

At this stage of our survival analysis, the system would appear to require a balance of power to remain stable. Any group which cannot defend itself from a hostile advance is endangered, as the whale is endangered. The question arises, therefore, whether step 2 of the rule requires groups, absent a balance of power, to attempt to *dominate* "weaker" groups as a function of enhancing their own odds of survival. The question is a rational one subject

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130 The two step rule is utilitarian in that it measures decisions by the consequences relative to an objective. The objective here, however, is neither pleasure nor dollars but the continued existence of the *group* involved. Pleasure and dollars are separate values to be weighed in the process of choosing between suggested survival solutions or deciding to go against survival. See generally RICHARD A. POSNER, *ECONOMIC ANALYSIS OF THE LAW* (4th ed. 1992); RICHARD A. POSNER, *THE PROBLEMS OF JURISPRUDENCE* (1990); Fish, *supra* note 25.

131 See *supra* text accompanying note 48.

132 I make no claims that an objective moral theory based on survival is the only objective moral theory which can reasonably be advanced. My claim is that the processes of physical survival have to be accounted for.

to debate, as in Sentence 2b. I observe that the converse of the question also arises: whether step 2 of the rule requires groups to *assist* "weaker" groups as a function of enhancing their own odds of survival. Which strategy, given the functioning of the physical world, strengthens the odds of survival for the group making the decision?

Several commonalities among humans suggests that the latter is the rational approach under the current state of world affairs. One commonality is the desire of each group to survive and to see its succeeding generations survive.<sup>133</sup> A second commonality is that humans are rational and conscious. A third commonality is that "weaker" groups are not powerless. Individuals possess the power to survive and to overcome obstacles, if they become aware of that fact. The conclusion is that, unlike non-free willed organisms, "weaker" groups will foresee the consequences of domination and take steps as acts of free will to counteract "stronger" groups by strengthening their defense capabilities or otherwise take actions to counterbalance their opponent's strength.

If rationality, consciousness and free will are enhancements to the prospects of survival, then all groups which possess the power to survive will continually endeavor to survive by establishing and reestablishing the balance of power between interacting groups if that is their best or only rational option. If so, a strategy of domination would potentially achieve nothing more than a pattern of continual world conflict, leading to failures to survive on both sides of most or all physical conflicts. Physical conflict invites retaliation. Rational analysis, on the other hand, identifies the common *factors* required for mutual survival. If this is the case, the desire to survive provides the common value, and the power to survive—combined with rational analysis—provides the common means, for an objective morality to function between culturally diverse groups.

I suggest that this process leads necessarily to a mutual recognition of physical, although not philosophical or ideological, neutrality with respect to the subjective moral values and preferences of the different communities or groups, *except* as to those points which threaten mutual survival. If so, then the physical rules of survival support behavior which leads to non-violent coexistence.

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133 If the group does not desire its succeeding generations to survive, then under the objective test the group will be on a survival course only if the consequences of their desire for prolongation lead to long-term survival for the group *without* requiring consideration of the survival interests of successive generations. This may have generally been the case in the past. It is not apparent that it will remain that way.

Whether or not such a process actually takes place, or will tend towards taking place, depends on whether the subroutines of X, including free will, are a long term enhancement to our prospects of survival and on whether it is more rational to lend assistance than to attempt conquest in light of the current world situation.<sup>134</sup>

With respect to situation (ii), actions between the individuals of given group, the problem is to avoid the group fragmenting into smaller groups in a manner that causes physical conflicts leading to failures to survive. Whether the group remains intact is a function of the values the group has selected for S, P and I and a function of the operating environment. The selected values must be sufficiently flexible to accomodate changes in the operating environment of the group. The operating environment is a function of the objective and subjective values adopted by each individual in the group, as in Figure 11.

In direct relation to this is the question of multiple solutions. Rationality, in service to the group's survival, will suggest more than one, viable solution to a given problem. A mechanism is therefore needed for selecting from among multiple solutions. An objective morality based on survival does not require this decisionmaking mechanism to be neutral with respect to individual or sub-group preferences. It requires it to be stable. The group may have been organized to pursue subjective ends. Under the objective test, if the specific rules and values of the group do not work, then the rules must change or the group will not remain intact.

If the group is large and diverse, such a nation, the situation may become like situation (i), depending on the ability of sub-groups to influence the power structure. A decisionmaking process which remains neutral to individual preferences which do not disparage survival would provide a common basis for accomodating adjustments to the values and rules assigned to S, P and I. The existing power structure, however, may not be neutral with respect

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<sup>134</sup> Clearly the human world is not finished with ideological and cultural conflict. If the development of ideas is *on balance* an enhancement to long-term survival of the human species, then such conflict is not likely to come to an end. The question is whether groups will gradually develop *non-combative* techniques for developing, actualizing and exchanging ideas. In the same fashion that the exchange of genes strengthens the gene pool, I suggest that the non-combative exchange of ideas increases the odds of human survival. See generally JAMES D. HUNTER, *CULTURE WARS: THE STRUGGLE TO DEFINE AMERICA* (1991).

to the subjective preferences and values of its members. Nor can it be neutral with respect to any preferences and values which do not support physical survival. Realistically, conflicts in values are likely to occur. The forces behind these conflicts will play themselves out in the history of the particular group, through a potential mixture of physical conflict and rational accommodation. These forces are generated inside our heads. They appear to stem directly from our wants and desires.

We need more analysis on the source and role of wants and desires. Action appears to be triggered by desires. Wants and desires appear to be a principal source of actualizing power within the human brain. What regulates our assortment of desires? If ideas are physical, then what impact do ideas have on establishing new wants and desires? What role does rationality and moral evaluation play in monitoring incoming ideas? If individual freedom, for example, is a long-term advantage to the survival of the human species, then is hearing of freedom sufficient to "awaken" a motivating desire in the mind? Are ideas physical? We need more facts and more history to answer these questions.

Physical conflicts may be necessary for sub-groups to establish a stable basis for survival of their sub-groups within a larger group. Such conflicts will lead to failures to survive. The burden would appear to shift to the group in power to recognize the survival interests of its sub-groups. If it does not, and if sub-groups become aware of their power to survive where their short-term or long-term survival options are being denied, then conflicts would appear to be likely. If the group destabilizes, the values assigned to S, P and I will have to change.

I suggest that a theory of equitable distribution of benefits and burdens, balanced against the need for group survival, may be a logical consequence of an objective morality based on physical survival, at least in an environment of cultural diversity where sub-groups are not powerless.<sup>135</sup> Any other theory would seem to entail a preference for the subjective values of one individual or sub-group over another, leading perhaps to unresolvable conflicts or the requirement to maintain control by force.

History has shown, however, that systems based on force, which limit the options of particular sub-groups, can remain stable for long periods of time. This raises the question of whether force or consent provides the more effective basis for long-term survival

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135 See, e.g., RAWLS, *supra* note 4.

of larger groups such as nations, which are made up of smaller groups, such as families. I suggest that to answer that question requires an analysis of the factors of productivity and ingenuity, as well as stability. The use of force appears to decrease productivity (related to resources needed for survival) and to thwart ingenuity. If so, a system based on consent may have long-term survival advantages over a system based on force.

I further suggest that step 2 of the general rule provides a basis for supporting non-violent competition between individuals and groups (in ideas, economics or otherwise). Competition appears to be a physical rule of survival which serves to identify survival practices which are most efficient. A non-violent component avoids unnecessary failures to survive which might otherwise occur but retains the advantage. Competition encourages innovation. The combination of non-violent competition, equitable distribution of benefits and burdens, and stability based on consent appears to be a rational solution to the factors S, P and I. Whether individual nations will inevitably move in this direction depends, however, on the decisions free willed humans make and on the actual content of the physical rules of survival. We need more facts, more history, and more analysis on how the subroutines of X work.

## V. CONCLUSION

### A. *Is Human Survival Justified?*

The preceding pages of this essay have been based on the proposition that if humans want to survive, then they ought to adopt an objective morality based on physical survival. Generally, humans do desire to survive, so as to such humans the condition is met.<sup>136</sup> Philosophically, however, we are left with the question of whether humans ought to survive, for practical reasons or otherwise, as in Sentence 2b. Or, more broadly, can it be said that the humans species ought to survive?

The approach I've taken in the essay is to focus on small group survival. I've done so on the theory that if any given small group ought to survive, then the species ought to survive. Small group survival does not necessarily equate to individual survival. Survival, within in the context of the physical forces which pro-

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136 See HART, *supra* note 1, at 188.

duce life, incorporates a requirement for propagation of future generations of surviving groups. Self-interested survival is therefore a misnomer or contradiction in physical terms. The connotation that "survival" applies to individuals of groups and not to groups is physically misleading. The desire to prolong one's personal existence does not equate to survival in the physical sense. It equates only to individual prolongation. The desire to personally survive does not equate to a desire for the species to survive and may, in fact, work against species survival.<sup>137</sup>

This does not mean that each individual must want to physically participate in bearing offspring. It means instead that to participate in the physical process of survival, an individual must identify with some group and support that group's survival. The focus of survival is not short-term alone, but necessarily includes some vision of the status of the next generation and the generation after that. It is, in other words, an insufficient condition that most humans do desire to survive, unless it is meant that most humans desire to see future generations of their group survive.

### B. A Physical Answer

My first argument treats survival as a *physical* question: As a *physical* question, if survival is based on or is the consequence of a set of forces, like gravity, which is intrinsic to the physical world, then survival needs no more and no less justification than does gravity. That question resolves itself into a search for a justification for the underlying energy of the physical world and the nature of the fabric of empty space.<sup>138</sup> Searching for realistic explanations for energy and how energy behaves seems reasonable. Searching for a *justification* for energy seems unreasonable. The physical processes we see, investigate and rely on, trace back to the nature and character of energy. Energy appears to be self-justifying. Until it can be shown that energy is contingent, then it seems reasonable to conclude that energy simply *is*. Humans are an expression of the energy which constitutes known reality. It is from the behavior of energy that rational oughts can be derived. Adoption of

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137 See DULBECCO, *supra* note 15, at 167-217 (the development of a heterosexual requirement for DNA recombination and propagation potentially pits individual interests against the species).

138 See *supra* Parts IIIA & B and the questions at the ends of those two sections: (1) What sort of thing is energy, and what is its source? (2) What sort of relationship exists between energy and life?

the statement that "humans ought to survive" becomes self-justifying, as merely a recognition of the existing state of affairs and the self-justifying basis of energy.<sup>139</sup>

Under this physical scheme, it is the decision not to survive which requires justification. This is so because to not survive requires contradicting or intervening in the forces which have produced life. Accepting the forces which produced life requires only accepting nature, which appears to exist, i.e., is not an illusion. We rely on the scientific processes of nature on a daily basis. To deny something which does not appear to be illusory would seem irrational and require explanation. One would have to deny oneself in the process. Conversely, to affirm the processes of energy is to affirm oneself. Whatever else we may be subjectively—we are all materializations of the same kind of energy.

If the decision not to survive is physical, then it is explainable in terms of a miswiring in the brain. If it is an act of free will, then free will has chosen to act against the history of energy. It seems reasonable to ask for more than an explanation. It seems reasonable to ask for a justification for that decision and reasonable to accept energy as self-justifying.

### C. *Other Arguments*

If the adoption of the statement that "humans ought to survive" is not self-justifying, then can other rational arguments be made? As a realist, I believe I can infer several propositions from my examination of the rules of physical conduct and several tentative conclusions based on those propositions:

First, individual humans are confronted with a peculiar form of a categorical imperative. Namely, individual humans must decide whether they are going to continue to survive. They are presented with the question by the pressure of physical events. They are confronted with an imperative to make a decision on a continual basis, because they are continually free to reverse their existing decision. The imperative is peculiar in that it obligates a human to give an answer, but it does not obligate a human to give an affirmative answer.

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139 This is not to say that metaphysical explanations for energy should not be explored. Metaphysical explorations become part of the work done on the external world. Work done on the external world is one of the objective ends of the forces which produce life. See *supra* text accompanying note 48.

I observe that the *existence* of the imperative is not contingent on subjective choice or subjective action. The *existence* of the imperative does not rest on how humans subjectively evaluate surviving. Yet it demands a value judgment by each free willed human at the moment each human recognizes there is a choice. I suggest therefore that the existence of an imperative that necessarily demands an value judgment necessarily points to a value.<sup>140</sup>

Furthermore, the value must be absolute and not relative because the value is not measured by what survival does for some other process. All other ends, whether objective or subjective, could be found to be valueless, yet the physical processes of survival, which are an expression of energy, will nevertheless continue to exist as an intrinsic rule of energy itself, like gravity. This intrinsic rule will continue to demand an evaluation by any free willed organism that recognizes there is an option. Since the value of surviving is not relative, the value cannot yield to physical measurement. Humans have no way of measuring an absolute. All free will can do is recognize that the value is immeasurable or deny the existence of the value. Neither a denial nor an affirmation changes what the objective value is. This does not rationally establish that humans ought to survive, however, unless it can be argued that humans ought to affirm an immeasurable value by endeavoring to actualize that value. That the value cannot be measured would appear, however, to establish a basis for rationally declaring that all humans have an equal intrinsic value. Humans may measure each other on a relative basis, but each free willed individual is asked the same question and has the ability to give an answer.

Second, unless humans survive, no subjective end, except not surviving, can be achieved. Under this argument, personal survival must necessarily have *a subjective* value (to that free willed subject) equal to *no less* than whatever value that person assigns by free will to the alternate subjective end, whether or not the free willed subject recognizes an objective value in surviving. The value of an alternate subjective end is *measured* by a free willed subject's willingness to give up life itself.<sup>141</sup> If a free willed subject chooses to sacrifice his or her life for that alternate end, then the conclusion

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140 See *supra* Figure 7 and text accompanying note 90 describing the six variables involved in values.

141 See *supra* Figure 11 and text accompanying note 126. My suggestion is that a *free willed* person cannot hold a subjective value, (relative to an alternate end) which is higher than the greater of value, or value, (relative to *personal* survival).

is not that life is worth less than the alternate end, but that the value of the alternate end, to that subject, and therefore the value of life to that subject, is either immeasurable or is worth nothing.<sup>142</sup>

Third, whether or not individuals make a conscious decision about survival, their actions speak for them. Almost every human decides daily to affirm *de facto* the physical process of survival by getting up and going to work *and* by participating in a system which includes the propagation of the species. There is a problem with this. If surviving is not elevated to a conscious objective, and thought through rationally, then humans who intend to support survival may take actions which set into motion a stream of consequences which lead to an unwitting failure to survive. While it may not have been the case in the past, it appears to be the case now that for humans to survive they must consciously decide to survive and act rationally to avoid not surviving.<sup>143</sup> This argument is pragmatic in that it begins with the assumption that humans will endeavor to survive and moves forward from there. The inductive inference, which is postulated as a possibility, is that humans ought to survive. This inference can be acted on until falsified.<sup>144</sup> It has several billion years of history behind it.

Finally, the status of the surrounding environment with respect to the physical survival of future generations depends on what the present generation does. *If* there is a reason for the present generation to survive, whether we perceive it correctly or not, then presumably that reason will still exist for the next generation.<sup>145</sup> The next generation is dependent on the current one, however, for the opportunity to experience or discover that reason.

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142 Consider *Regina v. Dudley*, 14 Q.B. 273 (1884). I suggest that the drawing of lots among consenting participants in a situation where survival itself is on the line is the only course which supports stability of the human group. If no one in the group is willing to sacrifice their own life, then physical power will determine the outcome, as it generally does among non-free willed organisms. The force generated internally by the desire to personally survive is considerable. Such a force supports survival. Such a force actualized as raw physical power, however, supports short-term survival at the risk of long-term survival, at least where retaliation is possible. Where retaliation is possible, raw physical power is a weaker use of force than consent, which supports both short-term and long-term survival.

143 See *supra* Part II.A. (*Thought Experiments #1 and #3*).

144 See generally Lakatos, *supra* note 2.

145 See *supra* text following note 27.

I suggest this fourth inference from existing facts provides the necessary is/ought relationship to justify human survival, although it is contingent. *If* life has a present justifying value for a living organism or will have such a value at some point in the future, whether or not perceived, *then* physical survival becomes necessary in order to discover what that value is and to preserve that opportunity of discovery for a future generation.

#### *D. A Closing Thought Experiment*

*Experiment #5.* Imagine you are living twenty, thirty or forty years in the future. You've been successful and hate to think that your life will end one day. Bio-scientists have yet to figure out how to eliminate the aging process, but breakthroughs are occurring every day. The geneticists have already figured out how to replace the DNA of one cell with the DNA from another cell. A variety of cloning procedures are now available.<sup>146</sup> You know a doctor who is willing to substitute all the chromosomes from one of your cells for all the chromosomes of two different embryos in two different consenting surrogate mothers immediately after artificial insemination. These embryos will not be traditional offspring in the sense of combining half your chromosomes with half the chromosomes of your mate, but instead will be genetic replicates of you at the time of the cloning procedure.

What is life?

How does new technology fit into our survival processes? To what ends should new technology be directed, and how are advantages and risks to be measured?

*C. Emerson Talmage*

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146 The cloning concept described in this thought experiment does not (yet) exist. Cloning of selected genes in limited situations for medical uses does exist. *See generally* DULBECCO, *supra* note 15, at 127, 130-46 (discussing cloning); ENVIRONMENTAL IMPACTS ON HUMAN HEALTH 23 (Sidney Draggan et al. eds., 1987) (part of a report of experts submitted to the Council on Environmental Quality Interagency Subcabinet Committee on Long-Term Environmental Research). Experts in the field are debating the advantages, risks and ethics of genetic engineering procedures.