

**Being Human: A Biological, Evolutionary Definition of Human Thought and Behavior  
Patterns**

**CHILD OF THE CONTINUUM**

by Patricia Regdon, with relevant notes from the journals of Peggy Benton

"Child of the Continuum" is a theory which identifies human thought and behavior patterns, including morals and ethics, as adaptations which continue evolution through variation, competition and selection of various patterns of thought and behavior where new ideas or ways of doing things = mutation; human individual adaptive choices of such ideas or ways of doing things = selection.

Dedicated to the memory of Alan Gregg, Theodosius Dobzhansky, N.J. Berrill and Weston LaBarre who first encouraged me to develop this line of thought.

*"Sociobiologists beginning with Hobbes and continuing through Nietzsche to the present day, have seen that only an evolutionary analysis of the origins and transformations of ethical norms could ever properly make sense of them."*

*-Daniel Dennet*

*"I feel that we are ready now, or are in the process of finding ways to study our living form inside as clearly and as communicably in shared symbols as well as we've studied the physical world and ourselves from outside. We can feel our centers as well as our boundaries, our own centers and our centers of interaction with others."*

*-Peggy Benton*

*"One who loves and understands nature will never be alone and will never be afraid."*

*-Rachel Carson*

## CHILD OF THE CONTINUUM

### PART I

I am Patricia Bradford Regdon (born Mooney)

83 years out of St. Louis, MO, U.S.A., Earth

Outward Bound

Species: Homo sapiens

Genus: Homo

Family: Hominidae

Subfamily: Homininae

Order: Primates

Suborder: Haplorrhini

Class: Mammalia

Subclass: Placentalia

Phylum: Chordata

Subphylum: Vertebrata

Kingdom: Animalia

Eukaryota

It was the patterns that drew me.

Once when I was a child, I was playing with a new puppy in our backyard in St. Louis. It was a morning in June, fair and sunshiny, but still cool. And the puppy and I were playing hide-and-seek in the dappled shade, which fell from the old oak tree onto the grass and my father's rock garden. We were in a delirium of delight with everything – the blue sky, the rippling leaf shadows and splattered sunlight, the dew on the grass, our game – everything, when my mother called me to help her with the family washing. Slowly, I got up and, dragging my feet, hating it,

went down into the dark, damp basement of our house full of old jelly jars, coal, gardening tools, and water-bugs, and saw my mother's beloved harried face outlined against the gloom of the basement.

I wondered then, and have wondered ever since, even as I worked on this writing, why, in a world of such easy splendor, adults seem always harried. I know now, of course, that that day in June had come in the middle of the great Depression, and that my mother, gently reared in affluent circumstances, was living through a terrifying time with enormous courage. Day by day she breasted the waves of heretofore unknown financial hardship, fighting always to let my father know that he and his love were far more important to her than the material comfort her parents set such store by. She was proud of learning to do things her mother had never done, proud of not complaining, and immensely proud of the very slightly bohemian life she and my father and their writing and artist friends led. We were not really poor, but my father was a salaried man and an aspiring author, while my grandfather and uncles were successful businessmen. The Depression widened the chasm between them and him.

Ironically, the Depression eventually ruined them and left my father's disdained salary the financial mainstay of the whole family. But that had not happened yet, and on that eternal summer day, I knew that my mother felt poor, and coped; as I felt endlessly rich, and wondered.

My next clear memory of thought regarding the human condition is of myself sitting on the edge of my bed, cigarette in one hand, knitting in the other (the object in high school was to have as many crew-neck sweaters as possible), suddenly transfixed with the idea that for all the adult and religious talk about it, there was no clear determination of what good and evil might be. This was an idle and vagrant thought, but it pulled me to it, forcing me to think and analyze

until I came to the conclusion that the words “good” and “evil” were a kind of shorthand used to indicate which thoughts, activities, and behaviors were thought valuable and which were not.

Later in life, living in Germany just after World War II, I faced the question of good and evil in my own life – the betrayal of faith and love, the jeering face of a competitor. It was around this time that Freud’s ideas and psychoanalytic jargon began to permeate the thought and talk of most of the educated non-religious people I knew.

Freud’s concepts have always seemed to me to be valuable, in that he described aspects of human life and emotions (better understood by the ancient Greeks perhaps) in a more or less scientific way, and brought the consciousness of the subconscious to a place of prominence.

But in my agony, at that time, I found the Freudian concepts facile and fundamentally unrooted. I wanted some explanation of life and people that included flesh and blood and bone and sinew. Feeling bruised and beaten beyond redemption, and far beyond any Freudian help, and knowing the betrayer was not truly evil, I began the long journey of mind and soul that has brought me to this writing. That journey took me through eons of time and thought, reading and writing, going off on tangents, circling and settling for all the world, like a dog settling to sleep. It was the patterns that drew me.

Convinced, as I had been for a long time, that human concepts of good and evil were simply the shorthand for any individual culture’s accumulated experience with life (what worked for it and what didn’t), I sought endlessly for a link between those concepts of the mind and our physical being.

What drove me crazy all along was that I could see the similarity, duplication, if you will, of a single pattern of behavior, or activity, or motion: in the pattern of specie development, in

patterns of individual organism development, and in the patterns of development of human thought and behavior. The pattern is best described as it occurs in the amoeba, a lowly beast whom you may have met in zoology classes or through Robert Benchley's classic short movie "Love Life of the Amoeba." However you met him or remember him, you must recognize him as a very early organic form of utterly marvelous simplicity. He has a food vacuole through which he absorbs and distributes nutrients. He has an evacuation vacuole through which he expels any absorbed nutrients that don't suit, and the unusable remains of nutrients already metabolized. He moves gracefully about his watery world, putting forth bulges of himself in directions which seem to lead to food sources or comfort of some kind, and pulling in bulges that seem to be heading into danger. As he does so, he is adapting to his environment, and at all times, presents a lumpy, bumpy persona, sometimes turning into a veritable comet shape, when something in his environment looks especially enticing, sometimes curling into a tight ball, when the whole environment seems threatening. Occasionally, he pauses and seems to review his lumps and bumps, deciding which one is most promising. When he wants to reproduce himself, he simply lines up his chromosomes, produces a matching set, and divides. And no one knows who is mother or father, sibling or stranger.

This irregular pattern of movement is like a template of the movement of species, and life itself, as it pursues its never-ending quest to use the elements of the environment to maintain and extend itself. First comes the exploring spur, or projection, then the organization of the whole, or a large part of it, into the projection, trying one, then another, and always withdrawing the spur, projection, or whole body from sensed danger or discomfort. The pattern is traced in the evolution of species and by the whole mass of life in the three dimensions of space and the fourth

of time, spreading, finger by finger, bulge by bulge, to the most arid, the coldest, even the hottest areas of earth. The pattern is repeated in the journeys of Man; from Africa along the coast of the Mediterranean and India to the Pacific Islands and Australia, then branching up and back from India to the Arctic and the Orient, middle, northern and western Europe.<sup>1</sup> The pattern is repeated in the evolution of the thinking and imagination of Man, which adds a fifth dimension, since thinking and imagination are invisible and have no physical presence until they are voiced or affect behavior. Still, the patterns of Man's thinking and imagination spread according to the old patterns: the early spread of ways of hunting, tool-making, painting and sculpture, existing only in a specified area of time and space or co-evolving in different areas, but spreading – always spreading – in an amoeba shape, a bulge here, a withdrawal there.

Our adaptive ideas spread in the same lumpy, bumpy way as the amoeba moves. To better visualize the amoebic pattern of movement and growth as it characterizes the patterns of the evolution of species and life itself, see in your mind a three dimensional blob, which just keeps growing in every direction it can spread its form, by varying itself and its behavior to suit those areas into which it can expand. Now move yourself and your mind to Mars or outer space and look back. You will see the blob extending itself, in forward, back, up and down explorations through differing forms of itself, from the single or multiple points of its first appearance, to a presence throughout the earth: deep into its waters, high above in its skies, across water, across and into the land.

In the same way, think of the spread of the various religions among human beings, those of multiple Gods and spirits allied with natural elements, those of one God, those of prophets of

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<sup>1</sup> Spencer Wells, *A Journey of Man: A Genetic Odyssey*, (New Jersey: Princeton University Press, 2002)

God and those of sons of God, the spread of the use of zero, the keystone and arch, agriculture, writing, commerce, ways of communication. All these, and many more you can think of, begin in one area, or simultaneously in several areas, and then spread to the borders of a tribe or nation and by simple communication or endless, miserable strife, exchange ideas and ways of being. In general, human thought and behavior patterns represent adaptations to the environment, with mental and behavioral bulges and withdrawals the same as the amoeba's physical bulges and withdrawals. As fish swim and as birds fly, human beings walk, talk, think, analyze, imagine....

In each case, as an individual or individuals within a group develop a new way of thinking or doing, other individuals, and then perhaps the group find the development rewarding and adopt it. If it proves to be not advantageous over time, it gradually disappears: alchemy, stone fortifications, bows and arrows, old beliefs and superstitions. If it proves advantageous, it stays with us, changing and improving over time: religious beliefs, tools, weapons, dwellings, agricultural practices, arithmetic, medical practice, ways of communicating. Each development in human thought and behavior follows the amoebic pattern and Darwin's pattern of evolution through competition and selection. But Darwin's physical evolution is engendered by genetic mutation of form and behavior. The selections are made by time and circumstance, as one variety out-reproduces another through better adaptation to a given time and place. Human thought and behavior evolution, however, involves no gross physical changes or mutations, and occurs first in the imagination and thought of individuals and then groups, unseen and unknown to outsiders or to time, until they are voiced. They have no physical being, as already stated, until they change behavior. Additionally, human thought and behavior patterns are ADAPTIVELY selected by individuals and groups of human beings as they adopt or SELECT FOR them. As they adaptively

reject thought and behavior patterns, they SELECT AGAINST them. SELECTED patterns spread as they are found advantageous. Patterns SELECTED AGAINST disappear quickly or slowly. Many times, patterns of thought and behavior are first shunned and then embraced later and vice-versa. Think of Galileo and Ptolemy, of Martin Luther and Thomas Locke Think of Darwin himself.

Other times thoughts and/or behavior patterns are lost for a time, or lie unused until a use occurs. Indoor plumbing, or contraptions for the removal of human waste were used in castles in medieval times, and only hundreds of years later re-invented. Water gear odometers were invented in Greco-Roman times, lost, and reinvented several times before current forms appeared. At a far different level, some of the equations used by Einstein had been developed several decades earlier, considered a quaint mathematical curiosity and ignored until he found a secure place for them for all time.

So where the Darwinian model of evolution depends upon physical variation of form and the behaviors possible to a form, the evolution of human thought and behavior patterns depends upon the adaptive reactions of individual human beings, and results in changes in behavior, which may advance the reproduction of the species without time and energy consuming variation of form. Everyone seems to forget that Darwinian evolution of species includes evolution of behavior, all adaptive. No matter how beautiful or strong a creature may be, it must use its behavior or reactions to adapt to its environment or wither and die. Human adaptive strategies may be thought of as the most recent in the chain of evolutionary adaptive behavior.

Jared Diamond, Professor of Geography and Environmental Health Sciences at UCLA, has shown how several civilizations which pursued thought and behavior patterns beyond the

time of their real adaptive value suffered and disappeared. Sloan Wilson has shown how successful thought and behavior patterns in groups may even be genetically selected. As

Terrence Deacon says,

“Biologically, we are just another ape. Mentally, we are a new phylum of organisms...language, analysis, take off from reality. ...”<sup>2</sup> (to say nothing of imagination, right?)

Lewis Thomas, the finest scientific writer I know, says of language,

“We have been working at it for what seems eternity, generation after articulate generation, and we still have no notion how it is done. It is the most compulsively collective, genetically programmed species-specific, and autonomic of all the things we do, and we are infallible at it. It comes naturally. We have DNA for grammar, neurons for syntax. We can never let up; we scramble our way through one civilization after another, metamorphosing, sprouting tools and cities everywhere, and all the time new words keep tumbling out.”<sup>3</sup>

I had talked about my thoughts regarding human cultures as adaptations, in their earliest disordered state, with the late Dr. Alan Gregg of Rockefeller Institute who had advised me to write them up and submit them to authorities in the field of evolution for comment. Dr. Gregg, tragically, had died before I got the first writing finished. In it, I had simply assumed that considering human thought and behavior patterns as a part of the evolutionary continuum was taken for granted in the scientific community, and gone on from there. So as per Dr. Gregg’s instructions, when I had finished the first writing, I sent the paper to Theodosius Dobzhansky, at that time, the head of the Department of Zoology at Columbia University; N.J. Berrill, F.R.S. Professor of Zoology, McGill University; and Weston La Barre, Professor of Anthropology at Duke University. In 1957, things were pretty simple, and each of these men received the paper

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<sup>2</sup> Deacon, Terrence. The Symbolic Species: The Co-Evolution of Language and the Brain (Norton: New York, 1997).

<sup>3</sup> Thomas, Lewis. The Lives of a Cell: Notes of a Biology Watcher (Viking Press: N.Y., N.Y. 1974.), 152.

himself and responded quickly (in hand-written or hand-typed letters). They encouraged me to continue work on my idea and to refine it.

However, I was stuck in the town of Alpaugh in the central valley of California far from any recognized university and not exactly an intellectual Mecca. I had divorced and remarried and my new husband was the superintendent of the Alpaugh Unified School District, 240 to 260 pupils, K – 12. Before I knew it, I found myself teaching a 4<sup>th</sup> – 5<sup>th</sup> grade combination class on a provisional credential. I fell completely and permanently in love with the students and learned as much from them as I have learned any time, any place. But from then on, teaching was my job: other classes in Alpaugh, and English as a Foreign Language for adult education when we moved to San Jose. My teaching jobs and the general vicissitudes of life kept me from working on my idea and the writing for any consistent period of time. But it was always in my mind and had already begun to affect my way of living and thinking. My files brim with scraps of all kinds: match books, advertisements, etc., recording an idea or thought.

Meanwhile, in my teaching career, I had ended up inventing a method of helping foreign speakers to improve or erase their accents. Out of that grew a business (God forbid!) catering to classes for companies in Silicon Valley where a great number of foreign speakers were and are employed.<sup>4</sup> When my husband developed Alzheimer's disease, I had to sell the business. I took care of him at home, and then in a nearby nursing home until he died in 1994. It wasn't until I was over his death (I could write a book about that disease and his and my adaptations to it) that I was able to turn to my ideas and writing full-time.

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<sup>4</sup> Thomas J. Coates and Patricia M. Regdon. "THRICE: A Technique for Improving the American English Language Delivery of Non-Native Speakers." TESOL Quarterly, V8 (December, 1974): 363-373.

All those years I had been trying to explain to myself why and how the evanescent thought and concept of human beings could trace the same amoebic pattern of evolution as that of physical being, forming a continuum, if you will, of living behavior. I had realized somewhere along the line that scientific thought did not, as I had first assumed, include human thought and behavior as part of the evolutionary continuum, although the similarities in pattern to the variation and selection pattern described by Darwin had often been noted and E.O. Wilson and others had gone far in relating the two. (Note: Many scientists, I am sure, think of human thought, behavior and ethics as adaptive, but no recognized scientist, to my knowledge, has said so, or pursued the argument and its sequellae.)

Meanwhile, we had put a man on the moon and Watson and Crick (with the help of Rosalind Franklin, a crystallographer and pioneer molecular biologist) had created a molecular model of the human gene: from which point on the possibilities of genetic science leapt off in every direction and even became the stuff of television shows and newspaper headlines. Laboratory techniques produced the isolation of DNA and our great hunt for the book of human and organic genetic variations began. Now we have isolated the human genome and everyone in the field of molecular biology is working to figure out how it affects our daily lives and health.

I was overcome with excitement about our venture into space, even more, of course, about the DNA molecule, that exquisite climbing spiral of building blocks, the resplendent double helix.

Although I had kept up with most of the scientific literature, I had become so used to working alone that I continued to do so. I think now that this was probably an advantage since I was free of the constraints of mass-thinking, which often inhibit academics. I was still looking

for the link between the general pattern of evolution and the so similar pattern of the evolution of human thought and behavior. Having tried it and discarded it innumerable times, I finally found my answer and a logical argument for it in the adaptive response general to living creatures, but refined by their various capacities, as stated above. The capacities of the higher primates and Man make it possible for them to refine raw adaptive response on the basis of experience. In Man, I realized, with his central nervous system and language, adaptive response is not only refined by personal experience, **BUT BY THE CUMULATIVE EXPERIENCES OF HIS KIND.** Theoretically, any one of us has the recorded experience of all our kind with which to refine immediate response.

With the Internet, this becomes more and more possible, although we are of course restricted to our own experiences and those successfully communicated to us. Thus we are organisms whose knowledge of and adaptations to our environment are exponentially increased over the knowledge of and adaptations to the environment of other organisms. This extraordinary power of communicated knowledge and experience with the non-human and human environment, I believe, creates our sense of separation from the creatures around us and the continuum of life. We seem different and God-like to ourselves because our breadth and depth of knowledge of the environment is exponentially increased and thus, God-like.

With this recognition of the vast difference in knowledge between Man's refinement of adaptive response and that of other creatures, I felt I had finally linked human thought and behavior patterns, through the general adaptive response, to those of the continuum of organisms in which he occurs. Human cultures, ethics, morals, and concepts of the cosmos actually advance the behavioral continuum without discernible physical or genetic change. We have changed our

environments far more than we have changed ourselves. Our thoughts and concepts are invisible, as they live in our heads, but their physical expressions surround us. Anyone's original thought or concept is like the physical mutation of genes. It survives and mutates further if it is accepted by others as advantageous.

In order to confirm my thinking, I had to go back to the beginning. And now, there were hundreds of books and papers to which I could refer. I will let my favorite authors speak for themselves. Here and there I will paraphrase but only for the sake of time and convenience. To know the grandeur of these works, you must read them for yourselves.

### *The Beginning*

Richard Dawkins, who has iterated and reiterated the primacy of the gene's directions...

“At some point (in the ancient seas), a particularly remarkable molecule was formed by accident. We call it the *Replicator*. It may not necessarily have been the biggest or most complex molecule around, but it had the extraordinary property of being able to create copies of itself. This may seem a very unlikely sort of accident to happen. So it was. It was exceedingly improbable. In the lifetime of a man, things that are that improbable can be treated for practical purposes as impossible. But in our human estimates of what is probable and what is not, we are not used to dealing in hundreds of millions of years. If you filled in pools coupons [British lottery tickets] every week for a hundred million years, you would very likely win several jackpots.”

“Think of the replicator as a mould or template. It is built of blocks of material that are common to the primeval soup. The replicator's blocks have an affinity for like blocks and attracts them to attach themselves to it.”... “The building blocks that attach themselves in this way will automatically be arranged in a sequence that mimics that of the replicator itself.”<sup>5</sup>

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<sup>5</sup> Richard Dawkins. *The Selfish Gene*. (New York: Oxford University Press, 1989), 15.

Now Francis Crick...

“Organic substances called purines and pyrimidines” (present on earth before the coming of life) are the building blocks of the genetic molecule, DNA itself.”<sup>6</sup>

Dawkins again ...

“The primeval soup was not capable of supporting an infinite number of replicator molecules.”<sup>7</sup>

So they began to compete with one another for building blocks. At the same time, not every molecule had been copied precisely so that some molecules produced, while basically the same as the others, had tiny differences. Some of these oddities won out over their ancestors and neighbors in the competition for more blocks. Those who won out replicated faster and further than the others. Thus, the motor of evolution was established: variation of form and behavior, with selection of form and behavior through competition. “Selection” of an organic molecule or living being through competition does not mean that it beat all the others to death. It simply means that the selected form out-replicated or out-reproduced its competitors. Now, in human life and thought, think of Mom & Pop markets and their competition with chain stores. Think of the endless gimmicks and improvements to commercial products that are so remorselessly advertised.

Here, the lyrical precision of Ursula Goodenough:

“Life, we can now say, is getting something to happen against odds, and remembering how to do it.”...<sup>8</sup>

And once eukaryotic sexuality was invented, sometime around the Cambrian, countless systems were devised to recognize a mate of the correct species and the correct gender.” So,

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<sup>6</sup> Francis Crick. *Life Itself: Its Origin and Nature*. (New York: Simon and Schuster, 1981), 14.

<sup>7</sup> *The Selfish Gene*, 18.

<sup>8</sup> Ursula Goodenough. *The Sacred Depths of Nature*. (New York: Oxford University Press, 1998), 63.

“sometime around the Cambrian,” several million years ago, sex reared its ugly (beautiful by evolutionary standards) head and the process of evolution was accelerated, to produce from single-celled creatures, such as the amoeba, the multi-cellular plants and animals we see all around us, as we see ourselves, grandly situated amid the all-encompassing, exquisite tapestry of life.

Goodenough again,

“It all gets set up during embryogenesis when a fertilized egg divides into two and then four and then eight and eventually reaches ten trillion, with each set of daughter cells making decisions that influence decisions that influence decisions that influence decisions, each decision marked by a set of genes switching on or off in particular cells at particular times in the developmental sequence. And then, once it’s set up, once the correct cells form correct tissues and organs, the whole thing goes. Brains coordinate muscles, hormones coordinate metabolism and fear and conception, hearts pump blood, and kidneys filter it.”<sup>9</sup>

She continues, speaking of what brains and nervous systems do,

“More generally, much of biological evolution can be said to entail the evolution of what organisms are aware of. The first awareness focused on the physical and chemical properties of the planetary environment, but once a sufficient number of organisms came into existence, they became intensely aware of one another as prey or predators or symbionts....”<sup>10</sup>

She speaks of the human brain,

“The brains of organisms, like worms, are hard-wired: each member of the species has the same positions making the same synapses and performing the same functions. But as brains got larger and more complex, this stopped being the case, ...indeed, given that the human genome has perhaps 100,000 genes and the human brain 100,000,000,000 neurons, there is no way that each neuron could be specified by its own set of genes. Instead, the process of brain development gets set up with general instructions indicating general targets. Indeed, the construction

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<sup>9</sup> The Sacred Depths of Nature, 58.

<sup>10</sup> The Sacred Depths of Nature, 91.

of each mammalian brain can be thought of as an evolutionary event in and of itself, with much fine-tuning left to contingency and selection.”<sup>11</sup>

Now, back to Lewis Thomas: ...

”We are not made up, as we had always supposed, of successively enriched packets of our own parts. We are shared, rented, occupied. At the interior of our cells, driving them, providing the oxidative energy that sends us out for the improvement of each shining day, are the mitochondria, and in a strict sense they are not ours. They turn out to be little separate creatures...they have maintained themselves and their ways, replicating in their own fashion, privately, with their own DNA and RNA quite different from ours. They are as much symbionts as the rhizobial bacteria in the roots of beans. Without them, we would not move a muscle, drum a finger, think a thought.”<sup>12</sup>

These are the bare bones of our being, our beginnings. Each human being is endowed with a set of genes that make his physical development and maintenance possible, and also direct him to move in thought, behavior, and imagination, as the amoeba and all other creatures do, only physically: toward what is needed and comfortable, away from what is dangerous and uncomfortable, with an occasional pause to check things out, and a final temporary settling on one thought or another. I call this the “TAPS” pattern (toward, away, pause, settle). We do not visibly circle around and around, sniffing as we go, physically exploring our universe, as do dogs and cats and other creatures. We do our Toward, Away, Pause, Settle chores in our minds. (Our sniffing capacities aren’t much good anyway.)

As Goodenough states, “Much of biological evolution can be said to entail the evolution of what organisms are aware of.”<sup>13</sup> Awareness includes the development of organs of sight, sound, feel, and taste detection: eyes, ears, skin, tongue, and the organ which records awarenesses and relates them to one another, the nervous system. In the nervous system of the

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<sup>11</sup> The Sacred Depths of Nature, 91.

<sup>12</sup> The Lives of a Cell, 2.

<sup>13</sup> The Sacred Depths of Nature, 91.

human being, we find fairly good eyesight, hearing, smelling, taste, and finger-feel, and an extraordinarily well-developed central nervous system and a master-of-all, brain. The human brain, combined with a capacity for comprehensive language, probably produced self-consciousness.

Now, as the garrulous iconoclast, outstanding evolutionary biologist of his time, Stephen Jay Gould, said:

“We are but a tiny twig on a tree that includes at least a million species of animals, but our one great evolutionary invention, consciousness—a natural product of evolution...has transformed the surface of our planet.” (PMR: and quite a bit above and below the surface...) “...Has any other species ever left so many visible signs of its relentless presence?”<sup>14</sup>

Well, no. We alone are capable of all kinds of adaptations, of language, and of distinguishing ourselves from the world around us. And we have left traces of all our physical adaptations. Our early adaptations, of course, were of a practical, physical nature: hunting, tools, fire, etc. But almost immediately, we began imaginatively to try to place ourselves in our cosmos, to ally ourselves with the greatest powers we could identify. So far as I know there is and has been no primitive society that did not identify its gods and relate its origins to them.

This is understandable. Here was Man, not terribly large, hairless, clawless, and relatively toothless, compared with the predators which stalked his world. He needed all the help he could get, and if the hunting went well when he mentioned the name of a god, or the lightening and thunder let up when he mentioned another, he had sense enough to continue appealing to those gods and to add others. We know a great deal about early gods and creation myths, which Bill Moyers so ably discussed with Joseph Campbell in “The Power of Myth” series on public

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<sup>14</sup> Gould, Stephen Jay. Hen’s Teeth and Horse’s Toes. (New York: W.W. Norton & Company, Inc., 1984), 250.

television. There is also James Frazer's The Golden Bough and many other collections of the tales and myths of our ancestors, as well as the studies of peoples living today whose world is comprised of the spirits of animals, plants, and natural phenomena. (Note, Margaret Mead, Luigi Luca Cavalli-Sforza, etc., and the collected studies in Jared Diamond's masterful Guns, Germs and Steel.)

We also all know, precisely in some areas, less definitively in others, of the development of a belief in one God and then in prophets of God and a son of God that resulted in the more modern religions. Religion is still a powerful adaptation for those who find life without such belief physically or emotionally intolerable. All along, our ancestors, as we, attributed chosen customs and ethics to the directions given by Gods, God, or prophets. This had the adaptive advantage of making stronger bonds person-to-person thus contributing to the strength of the community. Patterns of ethics and morality which had previously been selected as advantageous now became linked to the greatest powers our ancestors could conceive.

Also, all along, our ancestors, as we, explored, analyzed and kept track of the plants and creatures around them, beginning the long march of Science, and with the tools they developed, Technology.

This is my world, my cosmos. A form of energy became life, and life moved by trial and error throughout the areas it could reach. Mutation, competition and selection are really a more complex form of trial and error. Very late, long after life's appearance, it produced Man, who has lived by its laws of variation, competition and selection of thought and behavior adaptations, the TAPS pattern, all along, without knowing it. Because he seemed to himself so different from the creatures around him, he assumed that he was of god-like stature, and in some ways he is. His

form is nothing special, but is able to adapt to many environments, to eat many foods, to do many things. He has learned to swim like the fish, to fly like the birds, to listen, with radar, like the bats. Above all, he can pass his knowledge of the environment and himself to his fellows through speech and writing. And as all mammalian species, he rears his young in the patterns he has found most valuable, “replicating” them in his young. However, he is able to change the patterns as he adapts to further discoveries in his cosmos and in himself, as I am confident further research into primate and mammalian life will show that primates and some other mammals do, though to a far lesser extent.

As said, what is perfectly visible to us in dogs, cats, and the other species with which we are familiar: the sniffing here, sniffing there, looking here, looking there, listening here, listening there and finally choosing a direction, or sitting still, waiting for...?, we do in our heads, with some sniffing occasionally, lots of looking, and intense visualizing. Sometimes there is a general body response to an event or a person, an instinctive forward or away, which focuses our attention. More generally, however, the mind roils along directing our actions to suit our feelings. Variation, competition and selection is the motor of organic being. As stated, it controls the selection of species as Darwin described it. I am arguing here that it also controls the behavior of all other organisms and ourselves. But with us, it is the work primarily, of the mind.

Our individual adaptations center around the primitive needs of organisms: food, shelter, security—although nowadays these translate to WORK TO PAY FOR: food, shelter and security for most of us. As we come to our endless decisions about ways of making a living and the work world; how and where we live, how and what we eat, which entertainments we choose; we let competing ideas form in our minds and choose from among them on a minute to minute, daily,

weekly, and yearly basis. We are adapting to our already accepted primary need adaptations for the most part. We do not dig and sow, find suitable caves, or carry personal arms in these times. But what do you think those grocery bills, rent or house payments, endless deed, documents and insurance payments are all about? We have substituted them for the agony of endless hunting and gathering, although paying the bills, surfing the web, talking to lawyers, and signing papers seem agonizing enough. At any rate, we let our minds entertain, vary, and select adaptively every day.

“...The competitive selection among scenarios is what we call *decision-making*.”<sup>15</sup>

Our individual selections regarding primitive needs and then the contemporary complexities of thought, added to those of our fellows, constitute the bases of our cultures, including cultural values, morals, ethics, and so on. We select always that which seems to us to work—to provide for our comfort in any sphere.

Our needs to love and be loved, to recognize and be recognized lie in the sphere of interpersonal relations, and give rise to the development of morals and ethics, as do our needs for safety and respect.

Now let me recap what I have been saying and offer more concrete examples.

I began with the questions:

- A. What do “good” and “evil” really mean?
- B. Why do the patterns of spread and development of human thought and concept duplicate the patterns of spread and development of species and life itself?

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<sup>15</sup> Wilson, Edward O. Consilience. (New York: Knopf, 1998), 115.

C. Must there not be a connection between human thought and concept and the living continuum in which it occurs?

D. If so, would such a connection explain concepts of “good” and “evil”?

I found the answers to these questions in concentrating on the adaptive behavior characteristic of all living things.

“Good” is the word we use to designate any thought, concept or behavior which we have selected for, as individuals, groups or nations. Our response to it is “Toward.” “Evil” is the opposite of “good,” and designates any thought, concept or behavior which we have selected against. Our response to it is “Away.” As we select for good and away from evil, as changes in our environment and ourselves force us to adjust the designations, we move toward designated and accepted “good” and away from designated and accepted “evil,” creating a spread and development of thought, concept and behavior which duplicates that of the spread of species and life itself. We choose adaptively for that which seems comfortable and rewarding to us, the “good,” and against that which seems threatening and uncomfortable to us, the “evil.” The connection between human thought and concept and the continuum in which it occurs is the adaptive instinct common to all life, occurring as:

1. The replicator molecule continues itself by means of behavior, or specific reactions to its environment which make possible the use of elements of the environment to maintain and extend the molecule. Although obedient to the laws of physics, this behavior can be called adaptive.
2. Tiny differences in the replicators provided differences in form and adaptive behavior which gave some variations an advantage in replicating further.

3. One difference in a molecule produced a protective shield for its replicators as they adaptively pursued maintenance and extension of themselves through use of elements of the environment.
4. The replicators, at this point called genes, built larger and larger protective structures, which helped them compete, with other replicator entities in the immediate and surrounding environments, for the elements they needed for maintenance and extension.
5. Those replicator, or gene, entities whose form and adaptive behavior utilized the environment better than others, survived; maintaining and extending their types and producing more tiny changes in their genes which resulted in new capacities for adaptation.
6. The replicators, or genes, still direct all of the varieties of life so produced, to continue replication as far and wide and as long as possible.
7. As varying forms of life adapt to various spaces and corners of the earth's land, sea and air, the most efficient adaptors survive and replicate further.
8. As more and more complex adaptive forms occur, movement, metabolism and reproduction are improved, as are sense and response and a more general adaptability.
9. In the millions of years that all this was happening, the characteristic amoebic patterns of growth in individuals, species and the entire continuum were produced.
10. Finally, Man appeared in the continuum. If it can be said that he continues himself by means of adaptive behavior so as to maintain, reproduce and extend himself, using variation, competition and selection of behavior patterns, and that he creates the

same kind of patterns of growth as the continuum in which he occurs; it becomes only logical to consider him a part of the continuum and a direct descendent of the original replicator molecule, his every thought and action arising as a part of his adaptive capacity.

11. Thus:

- a. Evolution of species through mutation, competition and selection has been and is, as much behavioral evolution as physical evolution. (No matter how beautiful, no matter how well-equipped with natural tools, no organism survives unless it reacts adaptively to its environment.)
- b. All organisms of every species react adaptively to their environments with whatever tools they have, choosing their adaptive actions through variation, competition and selection of possible actions and/or reactions.
- c. Our human species has superior tools, in its central nervous system and language, which evolved self-consciousness, a further inordinately important tool.
- d. Our ability to communicate thought and experience over space and time makes all human thought and experience (theoretically) available to all of us.
- e. Our knowledge of our environment and ourselves is therefore exponentially wider and deeper than that of any other organism.
- f. Human thought and behavior has always been and is always used adaptively, advancing the behavioral continuum of life without genetic mutations and physical change, as it is passed from person to person and generation to generation through mimicry, speech and writing.

- g. Science, Technology and Religion seem to be our major adaptive strategies and have produced our modern cultures.
- h. Religion, while still important to some individuals and peoples, can now be understood as a part of our adaptive history, no longer necessary for many of us.
- i. If we can now consider our thoughts and behavior patterns as adaptive trial and error, (mental variation, competition and selection) as all organic behavior has always been, we can organize our knowledge of our environment and ourselves around the concept of organic adaptation, physical and mental trial and error, using the TAPS (Toward, Away, Pause, Settle) model.
- j. As we do this, everything falls into place and we see ourselves as orderly parts of an orderly universe, whose laws we will understand further and further as our species continues its life.

Following this line of reasoning, we can finally answer the basic questions our species has always asked:

What are we? –A form of life.

Where did we come from? –The first replicator molecule.

Where are we going? –To carry our species and life itself as far as we can throughout the universe.

Is there a God or supernatural force which guides us? –Probably not, but we gain the same adaptive benefit as that of religion from a belief in ourselves as orderly parts of a gigantic continuum of experiment in ways of carrying life to its furthest possibilities in space and time.

These questions and answers will change as we adapt to further ideas and environments.

Purpose, identified here as that of continuing the experiment of life to its furthest possibilities, has always been a tortured concept in biology, seeming to refer to “divine” purpose or a power beyond the natural world. I am arguing here that if the genetically driven power of adaptation to secure further replication cannot be called purposeful, then the words “purpose” and “adaptive” have no meaning. I am also arguing that the evolution of adaptive behavior has been and is more important to the genes than evolution of form. Varying forms simply serve to protect the replicators, or genes. Evolution of form, as described by Darwin, was, of course, the first recognition of evolution, as it is immediately visible and offers three-dimensional proofs of its existence.

Proof of adaptive behavior and its evolution is all around us, but its genetic direction was invisible until we identified the DNA molecule and traced its effects in organic behavior. Proof that human behavior is adaptive (although the thought and concept which precede it are invisible) is that occurring as it does, within and as a result of the continuum, it can hardly be anything else unless an element of the supernatural is introduced. The concept of the supernatural does not lend itself to proof at all. Human beings have and do always adapt as they select behaviors; select behaviors as they adapt. Only in sexual selection do they select, to some extent, for form. As a species, they seem to have been naturally selected as a result of their exponentially improved adaptability.

Meanwhile, all the branches of scientific investigation can be considered branches of human adaptive evolution: medicine, psychology, psychiatry, sociology, anthropology, archaeology, economics, linguistics, etc. Each has its own evolutionary history, as does the development of scientific method, itself. Early identification of the principles of mathematics,

physics, chemistry, and their combination in current molecular biology are the bases upon which our contemporary understanding of evolution rests.

Accepting these premises and proofs of our part in the continuum of life, we human bands of brothers, sisters, mothers, fathers, uncles, aunts and cousins can fly free in the cosmos, free to innovate thought, concept and behavior as our adventures dictate. The concept brings us again to the sense of a higher calling. Everything that every one of us does feeds into the mass of human experience and affects it, by milliliters and millimeters, perhaps, but affects it all the same. We can feel the same pride of service to something beyond ourselves—the experiment of life, our mission to carry it to the farthest reaches of space, as our forebears did as they slaved over the pyramids, the great cathedrals of the Middle Ages, Stonehenge, the Easter Island figures. In spite of the bloodshed, torture, terror, the four horsemen of the apocalypse, the endless wars, it would seem that in its time, religion did more good than harm. It celebrated concepts of honor, self-sacrifice, and charity. It comforted the always hungry, the always weary, and gave each individual a sense of belonging to something greater than himself. In recent years, as religious faith has declined, the human spirit has declined with nothing to look up to, into a desire for more and more things—to give life meaning? He who dies with the most toys wins? Or the spirit seeks escape into the shadowy dreams of drugs, the dubious comfort of unknowing. Now, again, the individual human being can feel that his every thought and act is significant as he moves toward, away, pauses and selects for a thought, a way of being. No one of us is always right. In the trial and error system that constitutes life, there are many mistakes and misadventures. It is in the overall success of maintenance, extension, and continuance of life that the glory lies.